

# Course Number Index

RIT course numbering: Throughout this bulletin and in registration materials that are published quarterly, courses are generally referred to by their seven-digit registration number. The first two digits refer to the college offering the course. The third and fourth digits identify the discipline within the college. The final three digits are unique to each course and identify whether the course is noncredit (less than 099); lower division (100–399); upper division (400–699); or graduate level (700 and above).

## E. Philip Saunders College of Business

0101	...	Accounting	30
0102	...	Management	30
0104	...	Finance	31
0105	...	Marketing	32
0106	...	Decision Science	32
0110	...	Business Legal Studies	33
0112	...	Management Information Systems	33
0113	...	International Business	34
0116	...	Consumer Finance	34

## Kate Gleason College of Engineering

0301	...	Electrical Engineering	46
0302	...	General Engineering	49
0303	...	Industrial and Systems Engineering	50
0304	...	Mechanical Engineering	51
0305	...	Microelectronic Engineering	55
0306	...	Computer Engineering	56
0307	...	Applied Statistics	58

## College of Liberal Arts

0501	...	Criminal Justice	89
0502	...	Language	91
0504	...	Literature	93
0505	...	Fine Arts	96
0507	...	History	100
0508	...	Science, Technology & Society	103
0509	...	Philosophy	105
0510	...	Anthropology	108
0511	...	Economics	110
0513	...	Political Science	112
0514	...	Psychology	116
0515	...	Sociology	118
0519	...	Interdisciplinary—Aerospace	120
0520	...	Interdisciplinary—Liberal Arts	120
0521	...	Public Policy	120
0522	...	Women's and Gender Studies	121
0524	...	International Studies	123
0525	...	Foreign Language	123
0526	...	Urban and Community Studies	130
0531	...	Material Cultural Science	130
0535	...	Communication	131
0550	...	Honors Courses	134

## College of Applied Science and Technology

0607	...	Packaging Science	2
0608	...	Civil Engineering Technology	4
0609	...	Electrical Engineering Technology	6
0610	...	Mechanical Engineering Technology	8
0614	...	Telecommunications Engineering Technology	10
0617	...	Manufacturing Engineering Technology	11
0618	...	Computer Engineering Technology	13
0619	...	Hospitality Management	14
0620	...	Nutrition Management	15
0621	...	Food Management	15
0622	...	Hotel and Resort Management	16
0623	...	Travel and Tourism Management	17
0626	...	Human Resource Management	17

0630	...	Environmental Management and Safety	18
0633	...	Safety Technology	19
0634	...	Emergency Management	20
0635	...	Health Systems Administration	20
0640	...	Reserve Officer Training Corps—Army	21
0650	...	Reserve Officer Training Corps—Air Force	21
0660	...	Electrical Mechanical Engineering Technology	22
0680	...	Accounting and Business Systems	22
0681	...	Business Administration Management	22
0684	...	Quality Management	24
0686	...	Humanities and Social Sciences	25
0688	...	Technical Communication	25
0692	...	Math and Science	27
0697	...	Multidisciplinary Studies	28

## National Technical Institute for the Deaf

0801	...	Accounting Technology	160
0804	...	Administrative Support Technology/Business Technology	161
0805	...	Applied Computer Technology	163
0806, 0887	...	Interdisciplinary Courses	158
0813	...	Computer Integrated Machining Technology	174
0825	...	Art and Computer Design	167
0827	...	Applied Optical Technology	165
0853	...	Pre-baccalaureate Studies	184
0855	...	Arts and Imaging Studies	168
0875	...	ASL-English Interpretation	158
0876	...	Deaf Studies Certificate	187
0878	...	Digital Imaging and Publishing Technology	176
0879	...	Laboratory Science Technology	180
0880	...	Communication Studies and Humanities	172, 175, 180
0881	...	Performing Arts	175, 176, 183
0882	...	Social Sciences	176, 186
0883	...	English	179
0884	...	Mathematics	182
0885	...	Science	184
0886	...	American Sign Language	162, 163, 175, 176
0886	...	Deaf Studies	175
0890	...	Computer Aided Drafting Technology	173
0891	...	Automation Technologies	171

## College of Science

1001	...	Biological Sciences	135
1004	...	General Biology	138
1005	...	Field Biology	139
1006	...	Environmental Science	139
1008	...	Analytical Chemistry	139
1009	...	Biochemistry	140
1010	...	Chemistry	141
1011	...	General Chemistry	141
1012	...	Inorganic Chemistry	142
1013	...	Organic Chemistry	142
1014	...	Physical Chemistry	143
1015	...	Environmental Chemistry	143

1016	...	Mathematics and Statistics	144
1017	...	Physics	148
1018	...	General Science	151
1026	...	Medical Sciences	151
1029	...	Polymer Chemistry	143
1030	...	Diagnostic Medical Sonography	152
1032	...	Physician Assistant	154
1051	...	Imaging Science	156
1055	...	Honors Courses	139, 148

## First Year Enrichment

1105	...	First Year Enrichment	188
------	-----	-----------------------	-----

## Center for Intercollegiate Athletics and Recreation

1105	...	Wellness	189
1108	...	Dance	190
1109	...	Fitness	191
1110	...	Health and Safety	193
1111	...	Lifetime Recreation Activities	194
1112	...	Interactive Adventures	197
1113	...	Martial Arts	198
1114	...	Military Sciences	199

## College of Imaging Arts and Sciences

2001	...	Interdisciplinary Imaging Arts	59
2009	...	New Media Design and Imaging	66
2010	...	Graphic Design	67
2012	...	Art and Design Extended Studies	62
2013	...	Foundation Courses	59
2014	...	Computer Graphic Design	69
2015	...	Interior Design	70
2019	...	Illustration	63
2020	...	Medical Illustration	65
2021	...	Fine Arts Studio	66
2035	...	Industrial Design	71
2039	...	Art History	60
2040	...	Ceramics	72
2041	...	Glass	72
2042	...	Metals	73
2043	...	Textiles	73
2044	...	Wood	73
2045	...	General Crafts Studies	74
2046	...	Crafts Extended Studies	74
2060	...	Fine Art Photography	80
2061	...	Biomedical Photography	81
2065	...	Film and Animation	75
2067	...	Photographic Arts	82
2068	...	Imaging Systems Management	84
2076	...	Imaging and Photographic Technology	84
2080	...	Printing Management	85
2081	...	Printing Technology	86
2082	...	Graphic Media	86
2083	...	New Media Publishing	88

## B. Thomas Golisano College of Computing and Information Sciences

4002	...	Information Technology	35
4003	...	Computer Science	39
4006	...	Medical Informatics	42
4010	...	Software Engineering	42
4050	...	Networking, Security, and Systems Administration	43

# Course Descriptions

Unless otherwise noted, the following courses are offered annually. Specific times and dates can be found in each quarter's schedule of courses, published by the Office of the Registrar. Prerequisites and/or corequisites are noted in parentheses at the end of the course description.

## College of Applied Science & Technology

### Index

0607	Packaging Science.....	2
0608	Civil Engineering Technology .....	4
0609	Electrical Engineering Technology .....	6
0610	Mechanical Engineering Technology .....	8
0614	Telecommunications Engineering Technology .....	10
0617	Manufacturing Engineering Technology .....	11
0618	Computer Engineering Technology .....	13
0619	Hospitality Management .....	14
0620	Nutrition Management .....	15
0621	Food Management .....	15
0622	Hotel and Resort Management .....	16
0623	Travel and Tourism Management .....	17
0626	Human Resource Management .....	17
0630	Environmental Management and Safety .....	18
0633	Safety Technology.....	19
0634	Emergency Management .....	20
0635	Health Systems Administration .....	20
0640	Reserve Officer Training Corps—Army .....	21
0650	Reserve Officer Training Corps—Air Force .....	21
0660	Electrical Mechanical Engineering Technology.....	22
0680	Accounting and Business Systems.....	22
0681	Business Administration Management.....	22
0684	Quality Management.....	24
0686	Humanities and Social Sciences.....	25
0688	Technical Communication.....	25
0692	Math and Science .....	27
0697	Multidisciplinary Studies .....	28

Course numbering: RIT courses are generally referred to by their seven-digit registration number. The first two digits refer to the college offering the course. The third and fourth digits identify the discipline within the college. The final three digits are unique to each course and identify whether the course is noncredit (less than 099); lower division (100–399); upper division (400–699); or graduate level (700 and above).

### Packaging Science

**0607-200** **New Student Seminar**  
An introduction to RIT and the department of packaging science. Course covers the basics of the packaging profession. **Class 1, Credit 1**

**0607-201** **Principles of Packaging**  
An overview of packaging that includes the historical development of packaging; the functions of packaging; and the materials, processes and technology employed to protect goods during handling, shipment and storage. A brief review of container types, package design and development and research and testing is presented, along with information about economic importance, social implications and packaging as a profession. **Class 3, Credit 3**

**0607-301** **Engineering Design Graphics**  
A basic course in engineering drawing. Topics include, but are not limited to, lettering, line quality, use of instruments, freehand sketching, orthographic projections, pictorials, sections, auxiliary views and dimensioning. Students learn how drawing is accomplished using a computer-aided drafting (CAD) application package. Drawing assignments required, concentrating on packaging applications. **Class 3, Lab 2, Credit 4**

**0607-311** **Packaging Materials I**  
The study of packaging materials from extraction through conversion and production, physical and chemical properties and uses. Emphasis is on metals and plastics used in packaging and on adhesives and other component materials. Recognized standard testing procedures are presented and students gain practical experience in the operation of various testing instruments, interpretation of results and evaluation of properties and performance characteristics. (0607-201) **Class 3, Lab 2, Credit 4**

**0607-312** **Packaging Materials II**  
The study of packaging materials from extraction through conversion and production, physical and chemical properties and uses. Emphasis is on paper, paperboard, wood, glass and propellants used in packaging applications. Recognized standard testing procedures are presented and students gain experience in the operation of various testing instruments, interpretation of results and evaluation of properties and performance characteristics. (0607-201) **Class 3, Lab 2, Recitation 2, Credit 4**

**0607-321** **Rigid Containers**  
A detailed study of primary packages that includes the history, manufacturing processes, characteristics and applications for containers in direct contact with the product. Structural design, chemical compatibility and suitability of container for intended use are analyzed for basic container types. Students practice structural design and testing of prototype containers. Primary emphasis is on rigid paperboard, glass, plastic and metal containers. (0607-301, 311, 312) **Class 3, Lab 2, Credit 4**

**0607-322** **Flexible Containers**  
Corollary course for 0607-321. Primary emphasis is on flexible paper, foil, plastic and laminated materials and on selected processing techniques. Topics to include folding cartons, heat seal technology and test methodologies, permeability theory, modeling and empirical testing. (0607-301, 311, 312) **Class 3, Lab 2, Credit 4**

**0607-341** **Computer Applications**  
Application of computer techniques for packaging. Review and analysis of current computer software packages for packaging and packaging-related applications, including design, optimum sizing, prototyping, simulation and specification preparation. (0607-321, 322) **Class 3, Lab 2, Credit 4**

**0607-401** **Career Seminar**  
Career opportunities in packaging science methods and procedures used in obtaining co-op and entry-level positions will be reviewed. Topics will also cover career advancement within the corporate organization and job changes. (Required prior to co-op, second year) **Class 1, Credit 1**

**0607-420** **Technical Communication**  
An introduction to the principles of effective written technical communication for the packaging professional. Topics include memos, business letters, summary activity reports, technical proposals and research papers. Open only to packaging majors and required as part of the packaging programs writing skills certification process. A grade of C or better is required. (0502-227 and 0607-321, 322) **Class 3, Credit 3**

**0607-431** **Packaging Production Systems**  
A study of package forming and filling, closing, product/package identification, inspection and other machinery commonly used in packaging, plus consideration of handling and storage/retrieval systems. Students become aware of project management techniques, setting timelines, critical path and resource evaluation. Quality issues are integrated into line and machinery designs. Students gain practice in setting up complete production lines for packaging various products. (0607-321, 322) **Class 4, Credit 4**

**0607-432** **Packaging for Distribution**  
An exploration of different shipping, storage and use environments common to various products and packages. Structural design of shipping containers for product physical protection and methods for testing and predicting package performance are studied. (0607-321, 322) **Class 2, Lab 4, Credit 4**

- 0607-433 Packaging for Marketing**  
A study of the interrelationship between packaging and marketing, detailing how the retail consumer package can be used as a marketing tool. The course concentrates on a systematic approach to developing an optimum package for a given product to meet the demands of the retail market. Advertising, marketing demographics and the impact of color on packaging are considered. Students gain practice in the development of a complete package system. (0607-431, 432 and 0105-363 or equivalent) **Class 4, Credit 4**
- 0607-462 Packaging Regulations**  
A detailed study of federal, state and local regulations that affect packaging. History of the development of packaging law; detailed study of recent packaging regulations, including the Fair Packaging and Labeling Act and the Poison Prevention Packaging Act; consideration of Food and Drug Administration regulation of packaging, including requirements for tamper-evident packaging; hazardous materials packaging regulations administered by the Department of Transportation; freight classifications, freight claims; weights and measures law; consumer product safety law; environmental law; and patent, trademark and copyright law as they apply to packaging. (0607-431, 432) **Class 4, Credit 4**
- 0607-485 Principles of Shock and Vibration**  
A study of the factors involved in analyzing potential damage to packaged items resulting from impact or vibration forces. Students are expected to master basic mathematical and physical concepts and to use various pieces of testing equipment. (0607-432) **Class 2, Lab 4, Credit 4**
- 0607-499 Packaging Co-op**  
One quarter of appropriate work experience in the packaging industry. Two quarters of co-op experience are required. (0607-321, 322) **Credit 0**
- 0607-502 Packaging Materials**  
This course is the first in a three-course bridge program. It is intended to introduce non-packaging students to the manufacture, physical and chemical properties of basic packaging materials and the evaluation of materials. Materials to be covered will include fiber, glass, polymers, aluminum and steel. **Class 4, Credit 4**
- 0607-503 Packaging Container Systems**  
This course is the second in a three-course bridge program. It is intended to introduce non-packaging students to the study of primary packages that come in direct contact with products. History, manufacturing processes, characteristics and application as well as evaluation of containers will be reviewed. **Class 4, Credit 4**
- 0607-504 Concepts to Consumers**  
This course is the third in a three-course bridge program. It is intended to introduce non-packaging students to the role packaging plays from product and package conception and development, through development, marketing, manufacturing and distribution to the final consumer and ultimate disposal. **Class 4, Credit 4**
- 0607-520 Packaging Management**  
A study of packaging organization in the contemporary corporation and project management techniques available to the packaging manager. Organization theory is discussed and compared with typical industry practice. Other topics include PERT, value analysis and the impact of regulatory agencies on packaging from a management standpoint. (0607-321, 322 or 504) **Class 4, Credit 4**
- 0607-524 Packaging Economics**  
A study of firm behavior with concentration on production costs and revenues. Market structures are analyzed in order to develop an understanding of how packaging fits into the general economy. Students are instructed in the use of basic economic reference materials for research purposes. A paper is required. (0607-321, 322 or 504) **Class 4, Credit 4**
- 0607-530 Packaging and the Environment**  
Consideration of packaging in a social context. Factors that enhance secondary use, recycling, recovery of resources and proper disposal are discussed. Package design in relation to solid waste disposal and materials and energy shortages is considered. Other topics of current social interest are discussed. Primarily a discussion class for senior students. Open to non-majors. (0607-321, 322 or 504) **Class 4, Credit 4**
- 0607-531 Packaging Process Control**  
An advanced course designed to give packaging students instruction in design, process and quality control techniques for packaging applications. Topics include the concepts of zero defects, computer applications for control charts and acceptance sampling. (0607-321, 322 and 1016-319 or equivalent) **Class 4, Credit 4**
- 0607-536 Medical Products Packaging**  
A study of unique requirements for pharmaceuticals and packaging materials and containers for sterilized devices. Current sterilization techniques, impacts on material properties and distribution requirements are considered for this specialized product group. FDA regulations for product development and manufacturing GMPs are addressed. (0607-321, 322 or 504) **Class 4, Credit 4**
- 0607-555 Export Packaging**  
This course consists of the study of particular forms and requirements for packaging for the export environment. Preservation techniques; international logistics; bulk intermediate containers; packing requirements; the export handling, transport and storage environment and related topics. **Class 4, Credit 4**
- 0607-568 Food Preservation and Packaging**  
A study of food products, common methods of processing and preservation, impact on quality and nutritional value of the product and the relationships with common packaging methods and distribution practices. (0607-321, 322 or 504) **Class 4, Credit 4**
- 0607-569 Packaging and Shelf Life**  
This course is a study of the concept of shelf life and degradation in products. The relationship between degrading reactions and protection offered by packaging is the core of this course. The course will review food chemistry, water reactions and microbial growth as part of the product degradation assessment. Package barrier properties will be evaluated using extrapolation techniques and empirical test methodologies. These two components will be integrated as the determination of a shelf life concept is taught. The understanding of polymers as materials that compromise package integrity will be addressed and evaluated. (0607-568) **Lecture 2, Lab 4, Credit 4**
- 0607-570 Point of Purchase Display**  
An interdisciplinary course considering the unique requirements for display packaging at the retail point of purchase. The retail store environment, display techniques, customer motivation, product tie-ins, construction techniques, production and distribution requirements, product promotion and point-of-purchase support materials and activities, design and printing of point-of-purchase displays. (An interdisciplinary, senior elective for students in packaging, packaging design, marketing, retailing and printing.) (0607-433 or 504 or equivalent) **Class 4, Credit 4**
- 0607-575 Technical Skills for Professional Sales**  
Introduction to a systematic problem-solving methodology in the sales profession. The core of the course explains the systematic 13 steps that lead to professional sales success. The rationale for each step is thoroughly explained, as are the procedures for implementing it. This course is required for all entering TM & D students. (0607-321, 322) **Class 4, Credit 4**
- 0607-577 Packaging Internship**  
This course number is used by students in the packaging science program for earning internship credits. The number of credits and the nature of on-location experience are determined by the student's adviser, subject to approval of the department. **Credit variable 1-8**
- 0607-590 Senior Thesis**  
An in-depth study of a selected phase of packaging that enables the student to use the knowledge and skills acquired during the course of the program. **Credit 4**
- 0607-596 Honors Packaging Science Independent Study**  
A supervised investigation within an advanced packaging science area of student interest. The student must be a registered CAST/RIT Honors program student. Consent of the instructor and the department approval are required. **Credit variable 1-4**
- 0607-598 Independent Study**  
Undergraduate research, in consultation with the instructor, on any packaging-related topic. Approvals are necessary from the department chair. Undergraduate Research and Independent Study (0607-598 and 599) combined total credit allowed is limited to a maximum of 8 credits. **Credit variable 1-8**

**0607-599** **Independent Study**  
Independent study, in consultation with the instructor, on any packaging-related topic. Approvals are necessary from the department chair. Undergraduate Research and Independent Study (0607-598 and 599) combined total credit allowed is limited to a maximum of 8 credits. **Credit variable 1-8**

## Civil Engineering Technology

**0608-198** **Introduction to CET, Freshman**  
This course introduces students to the CET program in order to ease the college transition. Information is provided on cooperative education, technical electives, liberal arts core and concentration courses and pre-registration procedures. Discussion of topics may include PE registration and NICET certification. **Class 1, Credit 1**

**0608-199** **Introduction to CET Transfer**  
This course introduces students to the CET program in order to ease the transition from their previous colleges. Information is provided on cooperative education, technical electives, liberal arts core and concentration courses and pre-registration procedures. Discussion of topics may include PE registration and NICET certification. **Class 1, Credit 1**

**0608-211** **Engineering Graphics with CAD**  
An introduction to engineering graphics as a means of communication in the fields of manufacturing and mechanical design. The course is laboratory oriented and provides the student with basic skills in print reading, spatial visualization, instrument drafting, freehand sketching and computer-aided drafting. Prior knowledge of engineering drawing or CAD is not required. **Class 2, Lab 4, Credit 4**

**0608-220** **Civil Engineering Graphics**  
The objective of this course is to develop an understanding of plans and drawings in civil engineering projects as well as in related disciplines: architecture, mechanical and electrical engineering and landscape architecture. This understanding is implemented by requiring certain drafting exercises relating to these drawings, incorporating pertinent lectures, making field visits to civil engineering works in order to make the connection between plans and actual structures and requiring exercises in the use and interpretation of plans. Civil engineering works include site development, structures, hydraulic structures, water and wastewater transport and treatment facilities and transportation facilities. Students develop an understanding of the technical and legal purpose of plans and how to assemble them. **Class 2, Lab 4, Credit 4**

**0608-225** **Problem Solving and Communications with Computers**  
This course provides students with a solid foundation in the use of basic computer software programs that have common applications in future courses and in the workplace. The programs include word processing, spreadsheets and public presentation software. The class structure includes instruction of new skills and practicing these procedures with laboratory problems. **Class 1, Credit 2, Lab 2**

**0608-303** **Land Development Computer Applications**  
Civil engineers will learn to use AutoDesk Land Desk Development (including Civil Design and Survey modules) software to create a mortgage survey map and a topographic base map from field notes and to design a site plan that will include a building layout, roadway alignment, profiles, cross sections, grading, storm sewers, earthwork and pond design. (0608-211,0608-220) **Credit 2**

**0608-304** **Structural Loads and Systems**  
An introduction to structural loading and load combinations. Calculation of structural loads on buildings in accordance with the New York State 2002 Code (NYS 2002), the International Building Code (IBC) 2000 Code and the ASCE 7-02 Code. Structural loads to be studied include dead loads, live loads, snow loads, wind loads and seismic or earthquake loads. Selection of structural systems for resisting lateral loads in building structures. (0610-302, 0610-303) **Credit 2**

**0608-305** **Structural Computer Applications**  
Introduction to commercially available structural analysis and design software that is widely used in structural engineering practice. The software is used in the analysis of 2-D and 3-D trusses and frames, beams, slabs and walls. (0610-302, 0610-303) **Credit 2**

**0608-320** **Plane Surveying**  
An introduction to surveying. Topics include note keeping, leveling, vertical and horizontal measurement, traverses and topographic mapping. Students apply lecture lessons to assignments in the field using modern surveying equipment. **Class 3, Credit 4, Lab 2**

**0608-330** **Materials of Construction**  
A study of Portland cement concrete and asphalt cement concrete. Aggregates, Portland cement and asphalt cement (each an ingredient in the concretes) are studied extensively. Mass-volume relationships are explored. Laboratory work focuses on testing aggregates, designing Portland cement concrete mixes and testing Portland cement concrete cylinders using ASTM standards. Students also test mortar (ASTM standard) and asphalt concrete (NYSDOT standards) in the laboratory. **Class 3, Credit 4, Lab 2**

**0608-340** **Route Surveying**  
An introduction to the fundamentals of route surveying and earthwork. Topics include simple horizontal curves, reverse curves, compound curves, transitional spiral curves and vertical curves. Techniques for estimating earthwork volume quantities are covered, along with development of drawing profiles and cross sections. Mass-haul diagrams are explored. Laboratory exercises include designing and laying out various types of curves in the field. (0608-320 Plane Surveying) **Class 3, Credit 4, Lab 2**

**0608-360** **Elements of Soil Mechanics**  
An introduction to soil mechanics and its application to problems encountered in civil engineering. Major topics include soil classification, strength and compressibility analysis, effect of water on soil characteristics and modern and traditional soil improvement techniques. Laboratory tests commonly used to evaluate engineering properties of soils are performed. (0610-302, 303 or equivalent) **Class 3, Credit 4, Lab 2**

**0608-380** **Elementary Structures**  
Applications of the principles of statics and strength of materials to the design and analysis of basic structural elements such as beams, T beams, columns, slabs and footings. The available time is split evenly between structural steel (allowable stress design using AISC guidelines) and reinforced concrete (strength design using ACI code). Design and analysis of steel connections are covered. (0610-302, 0610 303) **Class 4, Credit 4**

**0608-404** **Applied Mechanics of Materials**  
Basic strength of materials and statics are reviewed. Advanced topics covered include stress and strain, Mohr's circle concept, transversely loaded members, statically indeterminate problems, Euler's equations and column design principles. (0610-302, 303) **Class 3, Recitation 2, Credit 4**

**0608-420** **Hydraulics**  
A study of principal physical and mechanical properties of liquids, hydrostatic pressure and forces; pressure measuring devices; buoyancy and flotation; principles of kinematics and dynamics; Bernoulli's Law; concept of momentum. Flow of liquids in closed conduits and introductory principles of piping systems design; pumps and pump selection; flow of water in open channels and introduction to their design. (Physics, 0610-302, 303) **Class 3, Credit 3**

**0608-421** **Hydraulics Laboratory**  
An experimental study of principal physical properties of liquids and major laws of fluid mechanics. Operating various laboratory equipment and devices along with concurrently taking 0608-420, Hydraulics, for principal theoretical studies of physical and mechanical properties of liquids, hydrostatics, fluid kinematics and dynamics, hydraulic machinery and their operation. **Class 3, Credit 1**

**0608-422** **Elements of Building Construction**  
Elements and details of building construction, both residential and commercial, are explored. The course does not focus on design, but rather on specific building components and on how these components work together to create a functional building. Some of the topics include: foundations, light wood frame, heavy timber frame, steel, concrete, masonry, glass, roofing, curtain wall systems and interior finishes. The role of building codes in design and construction is introduced. **Class 4, Credit 4**

**0608-432** **Water and Wastewater Transport Systems**  
A brief overview of surface and groundwater sources. Hydraulic design of sewers, storm drains and potable water systems, including piping and pumping systems, storage and ancillary facilities. **Class 1, Recitation 1, Credit 2**

**0608-438** **Principle Treatment Water and Sewer**  
An introduction to water and wastewater treatment and interpretation of analyzed physical, chemical and biological water quality parameters associated with the design and operation of treatment processes. Fundamental principles and applications of physical, chemical and biological processes employed in water and wastewater treatment and the analysis of waste. Assimilative capacity of streams is introduced. (1011-272, 276, 0608-420) **Class 3, Credit 4, Lab 2**

**0608-444** **Mechanical Equipment for Building**  
A presentation of mechanical and electrical equipment used in both residential and commercial building construction. The course investigates HVAC, plumbing and electrical systems/equipment with an emphasis on function rather than design. Heat loss, psychrometrics, duct sizing and refrigeration systems are among the topics covered. **Class 2, Credit 2**

**0608-460** **Construction Equipment**  
The fundamentals of equipment characteristics, uses and earthwork productivity are explored. The course investigates excavators, loaders, scrapers, off-highway trucks, bulldozers and other earth-moving machines as well as cranes. Students gain practice in machine selection and equipment fleet assembly using productivity, operating costs and owning costs as criteria. **Credit 2**

**0608-470** **Timber and Design Construction**  
Discussion of the properties of structural lumber, including grades, sizes and design properties. Design of beams, columns, trusses, plywood diaphragms, shear walls and glued-laminated timber. The provisions of various building codes are investigated and the specifications of the American Forest and Paper Association are followed. A comprehensive group design project is assigned and some computer work using a spreadsheet program is involved. (0608-404) **Class 4, Credit 4**

**0608-480** **Groundwater Hydraulics**  
Groundwater movement and engineering applications. Topics include construction dewatering, groundwater remediation, flow-net analysis, flow analysis to wells and trenches, design of groundwater collection systems, pump selection and groundwater's interaction with engineered structures. Application of groundwater software. (0608-420) **Class 4, Credit 4**

**0608-482** **Hydrology**  
Presents the concept of the hydrologic cycle and the evaluation of its components. Course concentration on the analysis of stream and surface water hydrology, management of stormwater runoff, practical engineering procedures and hydrologic software. (0608-420) **Class 4, Credit 4**

**0608-485** **Hydraulic Structures**  
Analysis and design of engineered systems in lakes and streams. Topics may include drainage channels, erosion protection, bridge piers and scour, dam spillways and ancillary structures, docks, breakwaters, harbor structures and roadway systems. Many of these hydraulic systems will be evaluated using USCOE and USDOT design manuals. Approximately half of the course work involves the application of various software in analysis and design. (0608-420) **Class 3, Recitation 2, Credit 4**

**0608-490** **Structural Analysis**  
An introduction to loads and the analysis of statically determinate and indeterminate structures by classical and modern techniques. The types of structures covered include beams, trusses and frames that are loaded in the plane of the structure. Topics include introduction to cables and arches, influence lines and the effect of moving loads, determination of the degree of indeterminacy, approximate methods (including the Portal Method), moment distribution and an introduction to matrix methods. Some computer work using a popular structural analysis software program is involved. (0608 404) **Class 4, Credit 4**

**0608-496** **Reinforced Concrete Design**  
Design of members and frames of reinforced concrete. Topics include principles of structural design; loads; properties of concrete and reinforcement; design of slabs, beams, columns and footings. Emphasis is on the use of the ACI code and a comprehensive group design project is assigned. Some computer work is involved. (0608-303, 305, 404, 490) **Class 4, Credit 4**

**0608-497** **Structural Steel Design**  
Design of members and frames of structural steel and their connections. Topics include principles of structural design, loads, types of steels, tension members, columns, noncomposite and composite beams, beam-columns, column base plates and simple bolted and welded connections. The use of the AISC LRFD specification is emphasized and a comprehensive group design project is assigned. Some computer work is involved. (0608-303, 305, 404, 490) **Class 4, Credit 4**

**0608-499** **Civil Tech Co-op**  
One quarter of appropriate work experience in industry. (0606-099) **Credit 0**

**0608-500** **Labor Relations**  
An introduction to the fundamentals of labor laws as well as the understanding that good workplace relations depend upon interpersonal skills on a one-on-one basis. Topical legislative and regulatory subjects include the Fair Labor Standards Act, National Labor Relations Act, Davis-Bacon Act, Americans with Disabilities Act, Civil Rights Act and other requirements of the workplace. In addition, time is devoted to an understanding of conflict resolution, sexual harassment, age-in-hiring, family leave and other managerial requirements and considerations that make the workplace effective and productive. Course content applies to conduct in engineering offices, construction firms and public works agencies and authorities. Several speakers from open shop and union backgrounds share their views and experiences with the class. The assumption is that graduates of the program will assume managerial positions.

**0608-509** **Cost Estimating**  
An introduction to direct cost estimating for construction projects. The estimating techniques covered include quantity take-off, labor productivity and pricing (labor, material and equipment). Drawings, sketches and specifications are used as a basis for developing quantities involving site work, concrete, masonry, steel and carpentry. Students also gain experience using Timberline Inc.'s Precision Estimating, an application software package used as a tool in the development of cost estimates. (0608-422) **Class 4, Credit 4**

**0608-510** **Design of Water Treatment**  
Principles of water treatment plant design. The course emphasizes the components of common municipal treatment works, although some industrial treatment processes are also covered. (0608-420, 438) **Class 2, Credit 2**

**0608-511** **Design of Wastewater Facilities**  
Principles of wastewater treatment plant design, conceptual and hydraulic design of activated sludge and trickling filter plants are studied. Tertiary treatment processes, such as nitrogen and phosphorous removal, are discussed. (0608-420, 438) **Class 3, Recitation 2, Credit 4**

**0608-514** **Land Use Planning**  
The environmental and social aspects as well as the engineering and cost considerations of land-use planning are covered. Topics included are zoning concepts, master plans, subdivision regulations and design criteria, flood plains, environmentally sensitive areas, wetlands, other planning and control tools, solar access planning and urban revitalization. Students are involved in an independent project consisting of a concept design for a subdivision or other land-use project. Extensive use is made of field trips and attendance at appropriate meetings or work sessions. (Drafting, Surveying and 0608-432) **Class 4, Credit 4**

**0608-525** **Civil Engineering in Resource Recovery and Waste Management**  
An introduction to civil engineering aspects of resource recovery and waste management, on source reduction and resource recovery. Topics covered are the history of the problems, societal reaction and legislation, minimizing and recovering wastes. Emphasis is on those aspects in which the civil engineer plays a role such as municipal solid waste landfills and hazardous waste permanent storage facilities, land application of biosolids, composting and environmental protection projects, including the brownfields program. Use is made of lectures, reading materials, outside speakers, field trips and certain projects. A section of the course focuses on international aspects of resource recovery and waste management. (0608-438) **Class 4, Credit 4**

**0608-527** **Soil Mechanics and Foundations**  
A study of physical, mechanical and engineering properties of soils; methods of determining bearing capacity; stress distribution within soil mass and settlement; spread footing analysis and design; lateral earth pressure and retaining walls analysis and design; pile foundation analysis and design principles and slope stability (0608-360, 404; 0608-528, Soil Mechanics Laboratory, must be taken concurrently) **Class 3, Credit 3**

**0608-528** **Soil Mechanics Laboratory**  
The soil mechanics laboratory is to be taken concurrently with 0608-527. Exercises include tests in internal friction by direct shear, unconfined compression, triaxial compression and consolidation. **Credit 1, Lab 2**

**0608-530** **Transportation Engineering**  
This course exposes students to the fields of highway, airport and rail engineering. The areas of administration, planning, design, construction, maintenance and operation are covered. After the introductory material is presented, stress is placed on specific skills needed in these fields, including highway, rail and airport standards; geometry and alignment; drainage; earthwork; safety standards; and structures. Ample field exposure to all elements is part of the formal structured program. Each student is required to perform an independent project consisting of the design of a section of highway. (Route Surveying) **Class 3, Credit 4, Lab 2**

**0608-535** **Pavement Design**  
This course works in conjunction with Transportation Engineering, providing detailed engineering knowledge on asphalt and Portland cement concrete pavement design. Included with the theoretical knowledge will be the development of and practice in, the necessary design skill. The course includes the design of new pavements and also addresses the very active programs in pavement recycling and bridge and pavement rehabilitation and strengthening. Problems are attacked in a practical manner, utilizing the expertise of national organizations and state highway departments involved in this work. **Class 4, Credit 4**

**0608-544** **Contracts and Specifications**  
This course includes a fundamental overview of contract law, followed by the application of this material in the contracts for construction. Subsequently, the student is exposed to construction specifications. Substantial use is made of actual documents such as those of the New York State Department of Transportation, the Construction Specification Institute and trade standards such as ANSI, ASTM and others. Students are required to develop and assemble a mock-up set of contract documents. Arbitration, design-build and partnering are discussed. **Class 2, Credit 2**

**0608-546** **Professional Principles and Practice**  
A treatment of legal and ethical aspects of the profession; review of codes of ethics and current professional problems. Features several guest speakers representing different segments of the civil engineering technology field. **Class 1, Credit 1**

**0608-560** **Construction Project Management I**  
An introduction to construction management. Topics include the various project delivery systems for building construction, along with planning, project organization, bonds, insurance, change orders, submittals and contract documents. CPM scheduling is covered in detail. Students gain experience using Primavera Inc.'s Suretrak, a Windows-based application software package used for construction project planning and scheduling. (0608-509) **Class 4, Credit 4**

**0608-570** **Principles of Dynamics in CET**  
Study of the basic principles of engineering dynamics. Topics include kinematics of particles, force, mass and acceleration, work and energy, force impulse and momentum and an introduction to vibrations and structural dynamics. Applications to practical engineering problems are emphasized. (0608-404, 490) **Class 4, Credit 4**

**0608-599** **Independent Study**  
A supervised investigation within a civil engineering technology area of student interest. Consent of the sponsor and departmental approval are required. Students are limited to a maximum of 4 quarter credit hours of independent study projects and two sections in any quarter, plus a maximum of 8 quarter credit hours of independent study credits earned toward degree requirements. **Credit 1-4**

## Electrical Engineering Technology

**0609-051** **ECTET FYE I**  
This course provides first-year students an opportunity to develop skills necessary to succeed in the ECT Engineering Technology Program. Through interactions in a small group environment, students will make friends with other students in their major, create a stronger bond with RIT and develop a working relationship with their academic adviser. The students will become more knowledgeable about the ECT engineering technology disciplines, career options and ethical issues. Students are required to successfully complete both quarters of ECT ET FYE.

**0609-201** **DC Circuits**  
This course has been replaced by 0609-214 Circuits Theory I and 0609-215 Circuits Theory II.

**0609-202** **AC Circuits**  
This course has been replaced by 0609-216 Circuits Theory III.

**0609-203** **Electronics I**  
This course has been renumbered. The new number is 0609-360.

**0609-207** **First-Year Orientation**  
An introduction to electrical engineering technology. Topics include engineering technology versus engineering, registration system, learning styles, cooperative education, time organization and management and electives in electrical engineering technology. (Enrollment as a freshman in the electrical engineering technology program) **Class 1.5, Credit 1**

**0609-214** **Circuit Theory I**  
An introduction to DC circuit analysis techniques. Topics include resistance with circuit techniques of Ohm's Law; current and voltage division; simplification of series, parallel, series-parallel circuits, bridge and ladder networks, Kirchhoff's Laws, Thevenin's Theorem, mesh analysis. (Corequisite 1016-204) **Class 2, Lab 2, Recitation 2, Credit 4**

**0609-215** **Circuit Theory II**  
A continuation of Circuit Theory I. This course continues the development of circuit analysis and design techniques, including Thevenin, Norton and Superposition theorems and nodal analysis. Inductance and capacitance are introduced and transient circuits are studied. An introduction to AC circuits is included. (0609-214) **Class 2, Lab 2, Recitation 2, Credit 4**

**0609-216** **Circuit Theory III**  
A continuation of Circuit Theory II with emphasis on the characteristics and analysis of AC circuits, including the topics of reactance, impedance, AC power and power factor, resonance, maximum power transfer, frequency, bandwidth and three-phase circuits. (0609 215) **Class 2, Lab 2, Recitation 2, Credit 4**

**0609-221** **DC Circuits and Simulation**  
This course has been replaced by 0609-214 Circuits Theory I.

**0609-222** **AC Circuits and Simulation**  
This course has been replaced by 0609-216 Circuits Theory III.

**0609-333** **Concepts in Systems and Signals**  
Continuous-time and discrete-time linear, time-invariant and causal systems are examined throughout the course. Theoretical concepts covered are the Fourier representation of a periodic waveform; the Laplace transform; convolution; signal sampling; and the z-transform. MATLAB is presented and used extensively. (0609-202 or 0609-216; corequisite 1016-304) **Class 3, Credit 4, Recitation 2**

**0609-337** **Electric Machines and Transformers**  
Topics include power concepts, magnetism, electro-magnetic force, fields, armature, commutators, rotors, stators, brushes, starters, controllers, DC machines, AC motors, alternators, single-phase and three-phase dynamos, three-phase circuits, phasors, transformer properties, isolation, efficiency and voltage regulation. (0609-202 or 0609-216 or 0609-411) **Class 3, Lab 2, Credit 4**

**0609-360** **Electronics I**  
An introduction to electronic circuits using semiconductor diodes and bipolar junction transistors. Emphasis is placed on device characteristics and specifications, biasing circuits, transistor modeling and applications in small signal amplifiers. (0609-202 or 0609-216) **Class 3, Lab 3, Credit 4** Note: This course has been renumbered and was originally 0609-203.

**0609-361** **Electronics II**  
A continuing course in the analysis and design of electronic circuits. Emphasis will be on the characteristics, operation and biasing of both insulated gate field effect transistors and the use of small signal parameters. Students are introduced to frequency response of circuits, differential amplifiers and power electronics, including class A, B and D amplifiers. (0609-360 or 0609-203) **Class 3, Lab 2, Credit 4**

**0609-362** **Electronics III**  
The operational amplifier is covered in detail. A wide range of its applications are explained and explored, including many amplifiers and comparators. DC and AC characteristics are studied. Frequency responses of RC and op-amp circuits are covered. (0609-361 and 1016-231) **Class 3, Lab 2, Credit 4**

0609-363

#### Electronics IV

This course applies the concepts of circuits and electronics to basic analog communication circuits for amplitude and frequency modulation. Topics studied are Fourier analysis, AM and FM transmission and reception, phase-locked loops, synthesizers, oscillators and DSB and SSB communication systems. (0609-362) **Class 3, Lab 2, Credit 4**

0609-403

#### Advanced Circuit Theory

An introduction to advanced circuit analysis techniques, including signal decomposition by Fourier Series, circuit characterization in the plane using Bode straight line approximation or pole-zero plots, Laplace transform methods for solution of circuit transients and investigations of active circuit stability. (1016-304, 0609-333, 0609-202 or 0609-216 or equivalent with Pspice or other simulation software) **Class 4, Credit 4**

0609-404

#### Control Systems I

Closed-loop control systems are analyzed with respect to their stability, steady-state accuracy and transient response. The design of compensation to improve system performance is included. (0609-403, 1016-304) **Class 3, Lab 2, Credit 4**

0609-407

#### Career Orientation

This course is an introduction to the cooperative educational placement process at RIT, the programs in the department and RIT resources. Topics include engineering technology vs. engineering, review of resources available at RIT, the co-operative education placement process, the ethical expectations of employers for co-op students and RIT during a job search. (Third-year student in electrical computer or telecommunications engineering technology during the current academic year) **Class 1, Credit 1**

0609-408

#### Transmission Lines

Development and application of the general transmission line equation starting from the distributed lumped LC model. Topics include the propagation of electromagnetic waves in a coaxial line; voltage, current and impedance; graphical methods for analysis; transmission lines as circuit elements. (1016-304, 0609-202 or 0609-216, 0609-403) **Lecture 3, Lab 2, Credit 4**

0609-410

#### Patents and Trade Secrets

This course explores the legal characteristics and limitations of intellectual property rights protected by patents and trade secrets through study of relevant statutes, court decisions and inventor behavior. The course is appropriate for anyone who anticipates involvement in the creation or management of intellectual property rights. Note: A party's legal rights depend upon his or her unique and specific factual situation. This course does not provide legal advice or direction. (Third-year status or POI) **(Credit 4)**

0609-411

#### Electrical Principles I

A service course offered to non-electrical majors studying in the technical disciplines. Topics covered include basic electrical circuits, network theorems, power and energy concepts, power factor correction and basics of transformers. The laboratory is an integral part of the course, where the experiments complement lecture material. (1016-204 or equivalent) **Class 3, Lab 2, Credit 4**

0609-412

#### Electrical Principles II

An introductory survey course in the basics of analog and digital electronics. Analog topics include basic semiconductors, transistor circuits and operational amplifiers. Fundamental digital logic concepts include an introduction to combinational and sequential logic. Various transducers and associated circuits are introduced. (0609-411) **Class 3, Lab 2, Credit 4**

0609-413

#### Applied Microprocessors

Applications of a contemporary microcontroller will be used to teach engineering technology students digital logic, assembly programming and microprocessor interfacing. This course is intended as a service course for non-electrical majors who have not taken digital fundamentals. (0609-411) **Class 3, Lab 2, Credit 4**

0609-414

#### Basic Electrical Principles

This is a basic study of important electrical concepts for both AC and DC circuits. Topics covered include AC/DC circuit theory, single- and three-phase power distribution, power factor, line losses, efficiency, AC motors and transformers, energy costs, wiring methods, instrumentation and circuit protection. (1016-232) **Class 3, Lab 2, Credit 4**

0609-416

#### Automated Data Acquisitions

This course is an introduction to automated data acquisition and analysis. The LabVIEW software package is introduced and used to perform data acquisition, analysis of data and control of instrumentation. (0609-202 or 0609-216 or 0609-411) **Class 3, Lab 2, Credit 4**

0609-426

#### Analog Simulation Seminar

This is an introductory course in schematic entry simulation and simulation results interpretation of analog circuit designs. The analog simulation tool will be used to perform DC, time domain and frequency domain analysis of both passive and active analog circuits. (0609-202 or 0609-216) **Class 1, Lab 2, Credit 2**

0609-442

#### Advanced Electronics

A review of basic operational amplifier circuits is supplemented by applications of special-purpose amplifiers. Use of op amps in signal generation, regulation and active filtering is examined. Use of discrete transistors to augment power capabilities of integrated devices is included. (0609-362 or equivalent) **Class 3, Lab 2, Credit 4**

0609-499

#### Electrical Technology Co-op

One quarter of appropriate work experience in industry. (0609-362, 0618-438, 0609-407, or permission of adviser) **Credit 0**

0609-511

#### Laser Technology

This course in laser technology focuses on laser sources, laser drive electronics, temperature control and laser optics. In the laboratory students create real images using a laser and electronics they design. Motion control and image data synchronization techniques are discussed and utilized in creation of a working printer. Laser safety training will precede lab work. **Class 3, Lab 2, Credit 4**

0609-534

#### Communication Systems I

Analog modulation schemes and systems and the Fourier series are reviewed. The Fourier transform is introduced. The noise figure, noise temperature and signal-to-noise ratio of a system are introduced. Phase-locked loop concepts and applications to communications systems and an introduction to digital communication signals and systems are presented. (0609-363, 0609-333) **Class 3, Lab 2, Credit 4**

0609-547

#### Digital Signal Processing

Concepts of sampling theory are introduced along with the discrete-time Fourier transform (DTFT) and z-transform. Linear systems are reviewed, followed by an introduction to digital signal processing. System transfer function in the z-domain is analyzed, followed by the design of digital filters and the Fast-Fourier transform (FFT). Emphasis is on digital filter design and digital spectral analysis. (1016-304, 0609-333) **Class 3, Lab 2, Credit 4**

0609-550

#### Power Systems I

Basic elements of a power system, energy sources, substation configuration, load cycles, balanced and unbalanced three-phase circuits, power factor correction, transmission line configurations and impedance, voltage regulation of transformers and the per-unit system are studied. Load flow and economic operation are introduced. (0609-337 or 0609-411 and permission of instructor) **Class 3, Recitation 2, Credit 4**

0609-552

#### Power Systems II

Load flow and economic operation of power systems are studied. The symmetrical component method of three-phase circuit analysis is used for fault analysis. Power system relay protection, supervisory control, power quality and system stability are introduced. (0609-550) **Class 3, Recitation 2, Credit 4**

0609-554

#### Electronic Optic Devices

Lecture topics to be covered include light measurement and units, optics and optoelectronic transmitters and drivers. Radiometric and photometric units, black body radiators, optical flux and intensity of LEDs will be calculated using numerical and definite integration. Reflection and refraction from mirror and lens surfaces will be studied. LEDs and laser theory of operation and applications will be analyzed. Laboratory topics to be covered include fiber optic construction, splicing, connector application and polishing, testing, bends and OTDR, theory and advanced operation. (0609-362) **Class 3, Lab 2, Credit 4**

0609-580

#### Senior Project

Selected independent study of design project by electrical technology students with the approval of the department. Approval must be granted first week of fall or winter quarter for spring quarter registration. **Class/Lab as required, Credit 4**

**0609-596 Honors Independent Study**  
This course allows upper-class electrical engineering technology Honors students the opportunity to independently investigate, under faculty supervision, aspects of the electrical industry that are not currently covered in existing courses. Proposals for an Honors independent study must be approved by the sponsoring faculty, the electrical engineering technology program chair and ECT-ET Honors advocate. **Credit variable 2-4**

**0609-599 Independent Study**  
This course allows upper-class electrical engineering technology students the opportunity to independently investigate, under faculty supervision, aspects of the electrical industry that are not currently covered in existing course. Proposals for an independent study must be approved by both the sponsoring faculty and the electrical engineering technology program chair. **Credit variable 2-4**

## Mechanical Engineering Technology

**0610-211 Introduction to Materials Technology**  
This is a survey course of engineering materials and how these materials are matched to the service requirements of components. Emphasis is on metals; their structure, properties, heat treating and applications. (0610-304 concurrently) **Class 3, Credit 3**

**0610-220 Design Dimensioning and Tolerancing**  
This course focuses on dimensioning and tolerancing of parts and assemblies. Geometric dimensioning and tolerancing is emphasized throughout lectures, CADD exercises and physical measurement of parts. The course is project based: students examine an assembly to produce freehand sketches, 3D models of the assembly and its parts, 2D prints and a bill of materials. Emphasis is placed on proper dimensioning and modeling techniques. (0617-220, 262) **Class 3, Studio 2, Credit 4**

**0610-302 Introduction to Statics**  
An introduction to the analysis of static structures covering free-body diagrams, forces, moments, vectors, equilibrium, friction and analysis of structures and machine members. Applications are drawn from mechanical and civil engineering technology. (1017-211) **Class 4, Lab 1, Credit 4**

**0610-303 Strength of Materials**  
Students study how forces and moments affect axial, shearing and bending stresses and deflections of structural and machine members. The relationships between stress and strain, for both axial and torsional loading are explored. Beams, shafts, bolted or pinned joints and columns are analyzed and designed based on stress and deformation. Combined stress states are analyzed, including the use of Mohr's circle. Applications are drawn from the fields of mechanical and civil engineering technology. (C or better in 0610-302) **Class 4, Lab 1, Credit 4**

**0610-304 Materials Testing**  
A laboratory course that deals with the equipment, instrumentation and ASTM Standard Test Procedures used to perform physical tests on various materials and the preparation of laboratory reports. (0610-211 concurrently) **Class 0, Lab 2, Credit 1**

**0610-305 Pneumatic and Hydraulic Systems**  
This course involves the study of the basics of fluid power. Areas of study are pressure viscosity, turbulence, flow, thermal properties and displacement. Hydraulic/pneumatic components such as pumps, actuators, valves accumulators, lines, directional controls, sealing devices servomechanisms, hydraulic fluids and fluid containers are studied. **Class 3, Lab 2, Credit 4**

**0610-309 Computational Methods for Engineering Technology**  
Students develop proficiency in solving simultaneous equations, numerical differentiation and integration and curve fitting of data using mathematical and computational techniques. These applications are evaluated critically and students develop the ability to select the most appropriate methodology for a given problem. Students critically evaluate the solution results while working on project assignments in teams. (0610-302) (Corequisite 1016-232) **Studio 2, Credit 1**

**0610-312 Macroscopic and Microscopic Aspects of Metal Fusion**  
This course introduces students to the macroscopic and microscopic aspects of different types of welding. Students will experience and learn different welding techniques such as MIG, TIG, Stick and Oxyacetylene welding. Actual practice with the latest technologies such as MIG and TIG will reinforce concepts and provide practical hands-on experience. Several sample test parts will be welded in a lab and broken with a tensile tester to evaluate the calculated load compared to the welded joint strength. Weld samples will also be microscopically inspected to determine the HAZ (heat affected zone) of the material. Oxyacetylene and plasma cutting will be experienced. Interpreting weld symbols on drawings will be learned and applied. Lab fee: \$75 payable to local welding company. Students receive safety glasses, welding gloves and lab coat which they keep. NOTE: Lab is held offsite. Transportation required. (0610-211, 304) **Class 1, Lab 2, Credit 2**

**0610-315 Principles of Mechanical Design I**  
This course provides design fundamentals for mechanical systems that utilize components such as brakes, clutches, shafts, gears and pulleys. This project-based course will use reverse-engineering techniques to investigate component form, fit and function along with parts reduction, fabrication alternatives and feature improvements. Parts fabrication vs. catalog selection will be discussed. Ethics, as it relates to mechanical design and lifelong learning skills, will be enforced through examples of job expectations and direct student practice in the classroom. (C or better in 0610-303 and 0610-220 and 0617-220) **Class 3, Lab 1, Credit 4**

**0610-403 Failure Mechanics**  
In this course, the modes of failure of mechanical parts—static, fatigue and surface—are studied. The mechanisms of the different failure modes are presented as well as the different models used to predict behavior of mechanical parts under various loading conditions. Concepts are applied to the analysis and design of mechanical components. The computer is used extensively in the design process. (0610-303, 1016-231) **Class 3, Studio 2, Credit 4**

**0610-405 Applied Dynamics**  
The principles of dynamics and the solution of practical engineering problems are studied. The two-dimensional dynamic analysis of particles and rigid bodies is performed using the three fundamental analytical methods. These problems are also solved using computer simulation software. (0610-302 and 1016-231) **Class 3, Studio 2, Credit 4**

**0610-406 Dynamics Machinery**  
A study of the kinematics and kinetics of machine elements. Applications in robotics mechanisms are studied. Both graphical and computer methods are used. (0610-405) **Class 3, Lab 2, Credit 4**

**0610-407 Mechanical Engineering Technology Lab**  
This is a course in mechanical laboratory techniques and the preparation of laboratory reports. Experiments utilize principles of statics, strength of materials and dynamics. Students work independently and in groups to prepare formal and informal reports and an oral presentation. (0610-303 or 408, 0610-405 or 410) **Class 1, Lab 2, Credit 2**

**0610-408 Applied Mechanics I**  
Elements of statics and strength of materials. Topics include plane equilibrium, friction, stress, strain, torsion and the bending of beams. Offered as a service course to electrical engineering technology students and electrical/mechanical engineering technology students. (1017-211) **Class 3, Recitation 1, Credit 4**

**0610-409 Mechanical Engineering Technology Lab II**  
Students characterize polymers, ceramics and composites by performing tests of mechanical and processing properties according to ASTM standards. Emphasis is on analyzing experimental results and preparing professional-quality laboratory reports. (1011-208) **Class 1, Lab 2, Credit 2**

**0610-410 Applied Mechanics II**  
The basic concepts of statics and strength of materials are briefly reviewed. Additional strength of materials topics are introduced with the view of developing basic analytical procedures for the preliminary design of engineering structures and machine components. Topics include combined stress, transformation of plane stress, principal stresses and maximum shear stress, Mohr's circle, thin-walled pressure vessels, columns and structure stability. The fundamentals of kinematics and kinetics of particle motion are developed, including the study of Newton's Laws of Motion, energy methods and impulse and momentum. Offered as a service course to electrical engineering technology and electrical/mechanical technology students. (0610-408; 1016-232 concurrently) **Class 3, Recitation 1, Credit 4**



- 0610-416** **Materials Technology**  
The interrelation of properties, structure, processing and performance for non-metallic materials is studied. Emphasis is on materials and process selection for design application. Failure mechanisms are discussed, along with ways to minimize the effects of these mechanisms. (0610-211, 1011-208) **Class 4, Credit 4**
- 0610-432** **Computers in Mechanical Technology**  
This course reviews the fundamental operations and features of the Microsoft Windows operating system. A set of projects is assigned to utilize the most common features of Word, Excel and PowerPoint and to introduce other features that are important to engineering analysis and related report generation. The basic capabilities of MathCAD are utilized to perform calculations to generate graphs and to solve equations as well as to organize and document solutions to a variety of engineering analysis problems. **Class 1, Lab 2, Credit 2**
- 0610-440** **Applied Thermodynamic I**  
This is the first course in the first and second laws of thermodynamics and their applications. Thermodynamic properties of fluids including ideal gases and pure substances are studied. Thermodynamic processes and applications of thermodynamic principles to steam cycles and refrigeration cycles. (1016-232 or permission of adviser) **Class 3, Recitation 2, Credit 4**
- 0610-441** **Thermodynamics and Heat Transfer**  
The first and second laws of thermodynamics and their applications. Thermodynamic properties of fluids, including ideal gases and pure substances, are studied. Introduction to heat transfer by conduction, radiation and convection. Selection of heat exchangers. (1016-232 or permission of adviser) **Class 3, Recitation 2, Credit 4**
- 0610-442** **Heat Transfer**  
The first course in heat transfer. The theory and application of the fundamentals of heat conduction, convection and radiation. The design and application of heat transfer apparatus. (0610-440; corequisite 0610-460) **Class 3, Lab/Recitation 2, Credit 4**
- 0610-451** **Vibration and Noise**  
A study of the basic concepts of vibration and noise. Designing equipment for survival in vibration and shock environments. Methods of reducing noise in machinery structures. Environmental tests for vibration and shock. Methods of vibration and noise analysis will be demonstrated. (1016-304, 0610-405) **Class 4, Credit 4**
- 0610-460** **Applied Fluid Mechanics**  
The fundamentals of fluid statics and dynamics are studied. This includes the principles and applications of fluid statics, fluid kinematics, fluid kinetics, the energy conservation principle, dimensional analysis and fluid momentum. Also covered are laminar and turbulent flow in pipes and products, fluid machinery, fluid meters and lifting vanes. **Class 3, Recitation 2, Credit 4**
- 0610-465** **Thermo Fluid Lab**  
Students perform laboratory experiments in thermodynamics, fluid mechanics and heat transfer. Students will do a group project involving the design of an experiment, its instrumentation, method of test, data analysis and final report presentation. Special emphasis on report preparation and computer-aided data reduction. (0610-440, 460) **Class 1, Lab 3, Credit 3**
- 0610-499** **Mechanical Technology Co-op**  
One quarter of appropriate work experience in industry. (0606-099) **Credit 0**
- 0610-506** **Machine Design I**  
The static theories of failure and mechanical fatigue analysis are reviewed. These concepts are applied to the selection, analysis and design of power transmission shafts, power screws, fasteners, springs and spur gears. The design and selection of both hydrodynamic and rolling element bearings are studied. (0610-403) **Class 3, Studio 2 Credit 4**
- 0610-508** **Machine Design II**  
The study of the machine design principles in a design team environment to conceptualize design, build and test a product or mechanical system. Group projects from industry or school laboratory are emphasized. (0610-405, 506) **Class 3, Lab/Project 2, Credit 4**
- 0610-509** **Product Design**  
Integrates product development and design processes with establishing a need for the product; developing concepts; generating and evaluating the product concepts; developing specifications and design reviews; considering production, service and retirement. Special emphasis on teamwork (concurrent engineering), determining customer requirements (quality function deployment), design for manufacturing and assembly (DFMA) and quality/reliability. Students learn how to reduce material and part costs, assembly time and the number of parts in the product. **Class 4, Credit 4**
- 0610-512** **Computer Integrated Mechanical Design**  
The use of computer simulation and finite element method in solving mechanical design problems, such as stress concentration, dynamic impact, thermal stresses. Industrial projects are emphasized. (0610-405, 506) **Class 2, Lab 3, Credit 4**
- 0610-515** **Plastics Processing Technology**  
Various methods used to manufacture plastics products. Topics include compression molding, rotational molding, extrusion, injection molding, blow molding and thermoforming. (Fourth-year status) **Class 4, Credit 4**
- 0610-516** **Plastic Product Design and Materials Selection**  
The study of design guidelines for plastics products based on the interrelationships between product design, the material selected, the manufacturing process selected and the tooling to be used. (0610-515 or permission of the adviser) **Class 4, Credit 4**
- 0610-517** **Product Ideation and Concept Solution**  
This course introduces the principles utilized in the early phase of the design process. Topics include the process of generating and formulating an idea, developing a voice-of-the-customer (VOC) survey, utilizing a house of quality (HOQ) matrix for developing a product requirements document, brainstorming and ranking concepts through the Plough Concept Selection Matrix technique, among others. Patenting and intellectual property issues will be discussed and selected ideas will be evaluated against patent searches. This is the first in a series of three courses that will result in the completion of a product utilizing these methods. (Third-year status or permission of instructor) **Class 4, Credit 4**
- 0610-518** **Development and Design of New Products**  
This course is designed to offer the student an experience of what it is like to develop an idea into a real product. In this second of three courses the student will be responsible for taking the info from a previously selected concept and developing that into a working design. This design process will require the student to perform a design feasibility study, develop a product specifications document and be responsible for defining a preliminary manufacturing and assembly feasibility assessment. CAD will now be the "tool-of-choice" with which all work will be documented and handled with a standard release procedure that parallels industry protocols. It is expected that this product phase will require the implementation of many foundation principles from previous courses. (Third-year status or permission of instructor) **Class 3, Credit 4**
- 0610-519** **Product Realization**  
This course is intended to offer the student an experience of what it is like to develop an idea into a real product. In this third of three courses the student will be responsible for taking a project that is in the final design phase (from the Development and Design of New Products course) and provide the support necessary to develop models and working prototypes. The student will be responsible for applying design, manufacturing and assembly analysis along with other appropriate disciplines such as value analysis and process control. The results of these disciplines will guide the student into developing a fabrication process that will actually produce products at a reasonable quantity to sell. The student will also be responsible for setting up test procedures and evaluating the product for robustness according to a product specification document. (Third-year status or permission of instructor.) **Credit 4**
- 0610-523** **Instrumentation and Characterization in Plastics**  
This course is intended for fourth- or fifth-year students interested in understanding fundamental instrumentation used for the characterization of plastics. Major emphasis is on interplay between analytical and experimental methods in the solution and development of plastic products. In addition to theory and basic principles, the instrumentation and apparatus necessary for methods are examined in polymer permeability testing and characterization by differential scanning calorimeter (DSC), thermogravimetric analysis (TG A), Fourier transform infrared spectroscopy (FT-IR) and mechanical testing in an environmental chamber. **Credit 4**

**0610-530 Instrumentation**  
The design and use of force, torque, pressure, flow, temperature, acceleration, velocity and displacement instrument transducers. Laboratory experiments demonstrate calibration and set-up techniques and analysis of data. Principles of uncertainty, dynamic response, signal conditioning and computerized data acquisition are explained. (0609-411, 1016-304) **Class 4, Credit 4**

**0610-540 Applied Thermodynamics II**  
The application of thermodynamics to vapor power cycles, internal combustion engines, compressors, refrigeration, air conditioning, psychometrics and combustion processes are studied. Emerging technologies such as distributed generation, cogeneration and total energy plants are covered. (0610-440) **Class 3, Lab 1, Credit 4**

**0610-542 HVAC System Engineering**  
Principles and applications of refrigeration, air conditioning, comfort heating and ventilating are studied. Thermodynamics of air conditioning processes, psychometrics, moisture calculations and load estimating and operating costs are covered. (0610-440, 460) **Class 4, Credit 4**

**0610-543 Energy Management**  
Technical, management and cost aspects of energy conservation. Technical aspects of reducing energy consumption in utilities; processes; buildings; and heating, air conditioning and ventilation systems. Special topics such as furnace efficiency, heat recovery, heat pumps, pumping and piping and architectural considerations. (0610-542 or permission of instructor) **Class 4, Credit 4**

**0610-570 Robust Design**  
The fundamental principles of robust design are developed. The history of the robust design engineering methodology is presented. The concepts of the loss function, concept selection, parameter design and tolerance design are covered in detail. A structured design engineering methodology is taught with strict attention to the importance of linking engineering knowledge to Taguchi's approach to designed experiments. Metrics and analysis techniques are developed to optimize the performance of product or process components in spite of the variability of their design, manufacturing, or customer use environments. Specific attention is paid to a number of case studies to reinforce the students' conceptualization of the methods and their focus on engineering of optimized products and processes. (Fifth-year student or department approval) **Class 4, Credit 4**

**0610-596 Honors MET Independent Study**  
A supervised investigation within an advanced mechanical engineering technology area of student interest. The student must be a registered CAST/RIT Honors program student. Consent of the instructor and department approval are required. **Credit variable 1-4**

**0610-599 Mechanical Technology Independent Study**  
A supervised investigation within a mechanical technology area of student interest. Consent of the instructor and departmental approval are required. **Credit 1-8**

**0610-630 Tolerance Design**  
This is a comprehensive course on the topics of analytical and experimental development of design and production tolerances. The course covers worst case and statistical tolerance analysis, six sigma methods for tolerancing, Monte Carlo simulation sensitivity analysis of systems and Taguchi's approach to tolerance design. Special emphasis will be given to developing tolerances for complex aggregations of technologies. System tolerance and cost balancing are covered in detail. The use of tolerance design in critical parameter management will be covered. Students will conduct a project in computer-aided tolerance analysis. **Credit 4**

## Telecommunications Engineering Technology

**0614-207 TET First-Year Orientation**  
This course is designed to be an introduction to telecommunications engineering technology and the skills students need to be successful at the university. (Enrolled freshman in the telecommunications engineering technology program) **Class 1, Credit 1**

**0614-208 Cisco CCNA 1**  
CISCO Certified Network Academy (CCNA) course 1 provides coverage of layered network models, industry standards, network topologies, IP addressing, networking components, structured cabling, cable testing and basic network design. This course is part 1 of the CCNA curriculum. (1016-204 or equivalent or permission of instructor) **Class 1, Lab 2, Credit 2**

**0614-209 Cisco CCNA 2**  
CISCO Certified Network Academy (CCNA) course 2 provides coverage of beginning router configuration for and troubleshooting of WANs and LANs using concepts in the layered network models. This course is part 2 of the CCNA curriculum. (0614-208 and 1016-204) **Class 1, Lab 2, Credit 2**

**0614-210 Cisco CCNA 3**  
CISCO Certified Network Academy (CCNA) course 3 provides coverage of switching configuration, network segmentation and network management issues. This course is part 3 of the CCNA curriculum. (0614-209 and 1016-204) **Class 1, Lab 2, Credit 2**

**0614-211 Cisco CCNA 4**  
CISCO Certified Network Academy (CCNA) course 4 provides advanced coverage of switching configuration, network segmentation and network management issues. This course is part 4 of the CCNA curriculum. (0614-210 and 1016-204) **Class 1, Lab 2, Credit 2**

**0614-250 Fundamentals of Audio Engineering**  
This 4-credit course provides an introductory level study of the technology used in sound recording, production and distribution. Topics include microphone design types; selection and application; digital recording; the mixing console and mixing techniques; introduction to signal processing equipment and associated techniques; an introduction to the concepts relating to digital audio technology such as sampling, the Nyquist theorem, alias frequencies, quantization, dynamic range, compression and applications will be covered. (1016-204, 1016-225) **Class 4, Credit 4**

**0614-271 Telecom Fundamentals**  
A survey of and introduction to the structure and regulation of the telecommunications industry. The basics of data communications, telephony, switching systems, ISDN, multiplexing and networks are introduced. Data communication components, codes and techniques are identified. Methods for selecting, implementing and managing a computer network or telephone system are reviewed. **Class 4, Credit 4**

**0614-440 Management Topics for Engineering**  
This course provides future engineers and engineering technologists with a sound foundation in business principles. It will encompass four main topics in one course (4-in-One): engineering economics, ethics, diversity and project management with business principles as part of each topic. It is envisioned that the course will lay a foundation in project management basics and utilize a contemporary PC-based project management tool. This topic will be covered primarily in one two-hour lab each week. The first half of the lecture series will introduce and develop a keen understanding of core engineering economics. The latter part of the lecture series will introduce and develop business engineering ethics and the role of diversity in the workplace. (Third year or higher, at least one co-op block, knowledge of a spreadsheet application like Excel and knowledge of algebra) **Class 3, Lab 2, Credit 4**

**0614-464 Voice Communication Systems**  
Voice is perhaps the most basic form of communication and modern networks must continue to support high-quality voice communication. This course examines the basic characteristics of voice in both the time and frequency domains and shows on-line how these characteristics affect the requirements of communication networks. Both analog and digital representations of voice signals are considered, including advanced voice coding (e.g., G 729) for wireless and VoIP systems. The course covers baseband and carrier-based transmission of voice as well as real-time protocol (RTP) for VoIP. Signaling protocols for call processing for both circuit-switched and packet-switched communication are also covered. This course is similar to 0614-465, but it has no associated laboratory course and it requires a research paper. Students may not take both this course and 0614-465 for credit. (0614-271) **Credit 4**

**0614-465 Voice Communication Technology**  
Voice is perhaps the most basic form of communication and modern networks must continue to support high-quality voice communication. This course examines the basic characteristics of voice in both the time and frequency domains and shows how these characteristics affect the requirements of communication networks. Both analog and digital representations of voice signals are considered, including advanced voice coding (e.g., G 729) for wireless and VoIP systems. The course covers baseband and carrier-based transmission of voice as well as real-time protocol (RTP) for VoIP. Signaling protocols for call processing for both circuit-switched and packet-switched communication are also covered. Students may not take both this course and 0614-464 for credit. (0614-271) **Credit 3**

**0614-466** **Voice Telecommunications Lab**  
This course provides the laboratory component for material presented in 0614-465 and 0614-464. Day and evening sections are offered in sequence with offerings of course 0614-465. Distance learning sections are offered as an intensive weekend lab in conjunction with distance learning section 0614-464. Distance learning students must have completed either prerequisite prior to attending the scheduled RIT intensive weekend lab. On-campus day and evening students may register concurrently with on-campus offerings of 0614-465. **Class 0, Lab 2, Credit 1**

**0614-475** **Switching Technologies**  
This course covers modern and current switching, protocol, transmission, signaling and transport concepts used in public and private telecommunications networks. MPLS, GMPLS, signaling system #7, SONET, optical, packet and circuit switching fabrics are studied. Circuit switching, frame relay and ATM are introduced for comparison. (0614-465 and 0614-466 or 0614-464, 0614-477) **Class 4, Credit 4**

**0614-477** **Networking Technologies**  
This course provides a practical study of voice and data communications from the point of the OSI seven-layer and the TCP/IP five-layer protocol model. Traditional circuit switched telecommunications as well as VoIP are studied. This course covers the operation of the lower four layers in detail by examining some of the foundation laws, including Nyquist and Shannon as well as selected protocols. Emphasis is on data internetworking, local-area networking and wide-area networking. This course is problem based in that students apply the learning to various computer and networking mathematical problems. Lab work ensures a level of networking competency and provides reinforcement of concepts developed in the lecture. (1016-319, 1016-261, 0614-271 or permission of the instructor)

**0614-479** **Network Management**  
This course provides an intensive overview of the art and science of management of emerged and emerging telecommunications networks. It integrates technical, management and financial aspects of network management with emphasis on defining requirements and identifying methods of proactive measurement as well as providing specific study of the telecommunications management network (TMN) architecture model and interface specifications. The OSI and TMN compliant network management package NetExpert is used as a real-world reference. Where possible, other real-world examples are utilized to illustrate lecture topics. A case study/team project is researched and presented. (0614-465 and 0614-466 or 0614-464, 0614-477) **Class 4, Credit 4**

**0614-480** **Introduction to Telecommunications Policy**  
This course provides an introductory overview of domestic and international telecommunications policy and issues with special emphasis on domestic policy, regulation and law. Current issues, trends and standards will also be discussed. The course starts with a basic definition of telecommunications and why an understanding of policy, regulation/deregulation and law are important. It then moves to the history of U.S. telecommunications development with emphasis on the regulatory environment and continues with discussions of current U.S. regulatory policy at the state and federal levels. Current sweeping changes in the regulatory and legal arenas and the move to a new national and world model will be discussed. **Credit 4**

**0614-483** **Telecommunications Transmissions Systems**  
Fundamentals of transmission systems are introduced. Different types of transmission systems such as coaxial, fiber optic, microwave and satellite systems are studied and compared. At the end of this course students will be able to apply transmission system theory to the analysis and design of copper, fiber-optic and wireless transmission systems. (0609-333, 1016-304) **Class 3, Lab 0, Credit 3**

**0614-484** **Telecommunications Transmissions Lab**  
Laboratory and applications experience with transmission system concepts and analysis is provided to complement the lecture material in 0614-483 Telecommunication Transmission Systems. Students will use circuit simulation software, spreadsheet software and laboratory equipment to analyze, measure and characterize transmission system hardware components. (0614-483) (On-campus offerings allow concurrent registration in 0614-483) **Class 0, Lab 2, Credit 1**

**0614-499** **Telecommunications Engineering Tech Co-op**  
One quarter of appropriate work experience in a telecommunications-related industry. (0609-363, 0609-407, 0614-465 and 0614-466, 0614-477 or permission of academic adviser) **Credit 0**

**0614-520** **Fiber-Optic Telecommunications Technology**  
An introduction to fiber optic telecommunications technology. Review of basic optics, including ray, wave and quantum optics. Light propagation through multi-mode and single-mode fiber attenuation, dispersion and nonlinear effects. Introduction to optical components used in communications systems, including light-emitting diodes, laser diodes, photodiodes and passive optical components. Optical amplifiers and wave division multiplexing. Emphasis on reading and understanding manufacturers' data sheets for fiber and optical devices. (0614-483 or 0609-408,1017-212/272 and 1016-304 or equivalent courses) **Class 4, Credit 4**

**0614-561** **Telecommunications Network Engineering**  
Today's telecommunications networks rely on timing and synchronization, quality of service and capacity engineering. This course studies current and next generation methods and practices in the implementation of the above mentioned topics with respect to carrier networks that handle real time and non-real time traffic. Routing protocols and layer 3 addressing are also covered with respect to IP networks. (0614-475, 0614-477, 1016-304; corequisite 0614-562) **Class 3, Credit 3**

**0614-562** **Telecommunications Network Engineering Lab**  
This course provides the laboratory experience to complement 0614-561 Telecommunications Network Engineering. IP-based voice switches and routers are configured and tested for interoperability between traditional voice, IP telephony, data and transport equipment. (Corequisite 0614-561) **Lab 2, Credit 1**

**0614-574** **Network Planning and Design**  
This course is an introduction to the art and science of wide area network design. Various design approaches are introduced and several heuristic design algorithms are utilized. Blocking networks (telephone voice circuit networks) and delay networks (packet) are studied; greater emphasis is on delay networks. The course instills in participants the concept that most networks are holistic entities and, therefore, piecemeal approaches to their design yield limited results. A design tool called Delite (design "lite" version) is utilized. The course is taught in a collaborative participatory manner with considerable student interaction as opposed to straight lecture. Whenever possible, real-world examples are utilized to illustrate topics. (0614-479, 0614-561 and 562) **Class 4, Credit 4**

**0614-596** **Honors Independent Study**  
This course allows upper-class telecommunications engineering technology Honors students the opportunity to independently investigate, under faculty supervision, aspects of the telecommunications industry that are not currently covered in existing courses. Proposals for an Honors independent study must be approved by the sponsoring faculty, the telecommunications engineering technology program chair and ECT-ET Honors advocate. **Credit variable 2-4**

**0614-598** **Special Topics in Telecommunications**  
This is an experimental upper-level course that will allow innovative topics in the rapidly changing telecommunications field to be offered and evaluated as potential permanent components of the ET curriculum. **Class 4, Credit 4**

**0614-599** **Independent Study**  
This course allows upper-class telecommunications engineering technology students the opportunity to independently investigate, under faculty supervision, aspects of the electrical industry that are not currently covered in existing course. Proposals for an independent study must be approved by both the sponsoring faculty and the telecommunications engineering technology program chair. **Credit variable 2-4**

## Manufacturing Engineering Technology

**0617-220** **Manufacturing Processes I**  
This course will focus on the understanding and application of basic manufacturing processes. Students will be challenged to discover and learn how typical industrial piece parts and assemblies are constructed. Topics include material properties, powder metal processes, bulk deformation processes, metal removal processes and sheet metal forming processes. **Class 3, Lab 3, Credit 4**

**0617-262** **Solid Modeling and Design**  
This course introduces students to the engineering design process and solid modeling. Students learn visualization skills, parametric solid modeling and creation of engineering drawings that meet industrial drafting standards. Design projects are used to reinforce concepts and provide practical design experience. **Class 3, Lab 2, Credit 4**

- 0617-271** **Fundamentals of Solid Modeling**  
This course is intended for transfer students who have a background in a solid modeling package other than that used in 0610-220. Students will learn the fundamentals of Solidworks in preparation for taking 0610-220. **Lab 2, Credit 1**
- 0617-411** **Design for Manufacturing Assembly**  
The basics of Manufacturing Processes (I and II) are expanded and applied to the design process. Design is taken from early courses that deal with function and theories of failure and now is considered from the viewpoint of manufacturability. Part concepts will be considered for various manufacturing processes to determine which process will yield the lowest cost part that meets all product functional requirements. Cost will consider the sum of both piece part associated tooling and assembly costs (0617-420 and 0610-220 or instructor permission) **Credit 4**
- 0617-420** **Manufacturing Processes II**  
This is the second of two courses that teaches manufacturing processes. The first covers basic traditional processes and this course goes on to cover what are commonly referred to as nontraditional manufacturing methods. Within this category are processes such as electrical discharge machining, water jet machining, photochemical machining, ultrasonic machining, lasers, plasma cutting, rapid prototyping, etc. This is a project-based course; the student will individually, or in a team, investigate one of the processes in depth and study its application to a specific part. (0617-220) **Class 4, Credit 4**
- 0617-436** **Engineering Economics**  
A study of techniques required to make economic decisions. Topics covered in the course include cash flow analysis, present worth analysis, annual worth analysis, rate of return evaluations, benefit cost analysis, break even analysis, replacement analysis, bonds, the effect of tax on cash flows and sensitivity analysis. **Class 4, Credit 4**
- 0617-440** **Production and Operations Management I**  
This course in production and operations management focuses on operations terminology, operations strategy, design for manufacturing, project planning/control, value analysis and statistical quality control. (1016-319 or equivalent statistics course) **Class 4, Credit 4**
- 0617-441** **Production and Operations Management II**  
This course is designed to provide the student with knowledge of the latest theories and practices of operations management employed by world-class manufacturing organizations. Topics include TQM, MRP, JIT, lean manufacturing, six sigma, theory of constraints, work simplification and operations research. **Class 4, Credit 4**
- 0617-455** **Introduction to Surface Mount Electronics**  
This course will provide a thorough understanding of the technology, components, equipment, design and manufacturing process for surface-mount electronics manufacturing. As an introductory course, it will provide students with a strong foundation needed for advanced work in surface mount technology (SMT). The laboratory demonstrations will provide the students an orientation to and familiarization with the manufacturing equipment and process for printed circuit board assembly (0609-411 or equivalent electronics course) **Class 4, Credit 4**
- 0617-456** **Advanced Concepts in Electronic Packaging**  
This course deals with advanced topics in surface-mount electronics packaging. Topics include: electronics packaging standards, single-chip and water-level packaging technologies, advanced passive component technology, high-density interconnection and microvia technology, thermal management, thermomechanical behavior of packaging, solder metallurgy and joint formation for packaging, failure modes, mechanisms and reliability testing. (0617-455) **Class 2, Lab 2, Credit 4**
- 0617-457** **Electronics Packaging Lab**  
This laboratory class will provide the hands-on training in surface-mount electronics packaging. Students will learn to set up and operate production scale equipment, understand process parameters and their influence and characterize the entire PCB assembly process. Lab experiments will also include analytical evaluation of raw materials such as solder paste viscosity, tackiness, wetting, component and board solder ability, solder balling, etc. **Class 0, Lab 2, Credit 1**
- 0617-460** **Computer-Aided Design**  
CAD is introduced as an integral part of the computer-integrated manufacturing process. Basic concepts of CAD software and hardware, interactive graphics, CAD applications, CAD economics and the inter-relationship of CAD and CAM are discussed. The course work gives the student the skills needed to create 3D solid models using a parametric 3D solid modeling application. Emphasis is on laboratory work such as creating solid models and assemblies containing solid models with limited view creation and dimensioning. **Class 4, Credit 4**
- 0617-470** **Controls for Manufacturing Automation**  
This course deals with the principles and application of programmable logic controllers (PLC). Topics include PLC hardware, programming and application of PLCs in a computer-integrated manufacturing (CIM) environment. Students will also be exposed to man-machine interface (MMI) and PLC networks. (0609-411) **Class 3, Lab 2, Credit 4**
- 0617-471** **Computer Numerical Control**  
An advanced course in computer numerical control. Emphasis is on machine language and computer-aided parts program generation, tool path verification and program editing. Students create three-axis programs for CAD, generate models, then moderm their instructions to CNC machine tools to actually cut the finished part from raw stock. CAD/CAM integration and product lifecycle management (PLM) concepts are presented. (0617-220) **Class 22, Lab 2, Credit 4**
- 0617-472** **Tool Engineering**  
The course teaches the principles of design for industrial tooling. The course discusses the concepts of jig, fixture, measurement, die and automated equipment design, engineering analysis and manufacture. Workplace locating, supporting and clamping systems are emphasized. (0617-420, 262) **Class 2, Lab 2, Credit 4**
- 0617-475** **Computer-Aided Manufacturing**  
This course deals with the design and evaluation of manufacturing systems and the use of computers in support of integrated product design, development and manufacturing activities. Group technology, process planning, shop floor control, concurrent engineering and flexible manufacturing systems are the principal topic areas, while computer integrated manufacturing(CIM) is the primary theme. Lab activity is focused on integrated product/process development and process improvement. (0617-440, 470, 471, 485) **Class 3, Lab 2, Credit 4**
- 0617-485** **Robots in Manufacturing**  
This course deals with the technology and application of robots in a computer-integrated manufacturing (CIM) environment. It will provide a thorough understanding of robotic hardware and software. The hardware aspects include robot configurations, drive mechanisms, power systems (hydraulic, pneumatic and servo actuators), end effectors, sensors and control systems. The software aspect deals with the various methods of textual and lead-through programming. Digital interfacing of robots with other CIM components such as programmable logic controllers, computer-controlled machines, conveyors, etc. will be introduced. Robotic cell design and the socio-economic impact of robotics will also be discussed. A strong laboratory hands-on training component is part of the course. **Class 3, Lab 2, Credit 4**
- 0617-499** **Manufacturing Technology Co-op**  
One quarter of experience in a job related to the student's major. (0606-099) **Credit 0**
- 0617-510** **Process Design**  
A project-oriented capstone course to enable students to design, develop, implement and test a CIM cell. The students are required to work in teams and identify suitable product and process concepts that fit into a CIM environment. The students must demonstrate successful operation of the cell to receive a satisfactory grade. (0617-475 must be taken immediately prior to this course) **Class 1, Lab 4, Credit 4**

**0617-530** **Special Topics in CIM**  
This course is a technical elective offered to enable students to pursue subjects of special interest to themselves. Subject matter is limited to the area of CIM. Students will be given the opportunity to present a proposal outlining their goals for the course. Upon approval by the course instructor, students will be given wide latitude to investigate their CIM area of interest to a breadth and depth not available in a structured course. Students will be expected to work in areas and on problems of concern to the manufacturing industry. Acceptable projects will include those undertaken in response to specific requirements of an industry contact, individual research or research in conjunction with faculty or fellow students, library research, intercollegiate competitions, or investigative or original (innovative) papers suitable for publication. **Credit 2-5**

**0617-596** **Honors Manufacturing Engineering Technology Independent Study**  
A supervised investigation within an advanced manufacturing engineering technology area of student interest. The student must be a registered CAST/RIT Honors program student. Consent of the instructor and the department approval are required. **Credit variable 1-4**

**0617-599** **Independent Study**  
A supervised investigation within a manufacturing technology area of student interest. Consent of the instructor and department approval are required. **Credit 1-8**

## Computer Engineering Technology

**0618-101** **Freshman Seminar**  
This course provides first-year students an opportunity to develop skills necessary to succeed in the computer engineering technology program. Through small group interactions, students will make friends with other students in their major, create a stronger bond with RIT and develop a working relationship with their academic adviser. The students will become more knowledgeable about the computer engineering technology discipline, career options and ethical issues. (Enrolled as a freshman in the computer engineering technology program) **Class 1, Credit 1**

**0618-200** **Digital Fundamentals AP**  
This course is used ONLY for the purpose of transferring advanced placement (AP) credit for Digital Fundamentals (0618-301). Transfer credit will be granted only to students who receive a letter grade of B or better in Project Lead the Way's digital electronics course. **Credit 4**

**0618-206** **Computers and Their Applications**  
This is an introduction to the fundamental concepts and problem areas of computers and their applications through a survey of the major sub areas of the field. Students will learn the nature of programming and how to create simple programs using HTML. Students will also spend time using Word, Excel and other applications. Since this course is a combination of concepts of computers and applications, students will also study the history of computing, how computers are built, the Internet, automation and control systems, the future of computers and ethical and social issues associated with computers and their applications. **Class 4, Credit 4**

**0618-213** **Excite—Introduction to ECT-ET**  
In this course, electrical, computer and telecommunications engineering technology freshmen will construct a TekBot, an autonomous robot platform. Through engaging hands-on activities, the TekBot will be used to excite and inform students about their chosen program of study and expose them to the basic concepts utilized within. These topics include systems of units and notation, voltage, current, resistance, component identification, circuit construction and schematic entry. **Credit 4**

**0618-220** **Electrical Fabrication Techniques**  
This course has been replaced by 0609-214 Circuits Theory I.

**0618-231** **Technical Programming I**  
The first course in a three-course sequence in developing software for the solution of technical applications. Specifically, procedure-oriented programming of the C++ language will be employed to develop software solutions for engineering and scientific applications. Object-oriented programming will be introduced by the use of predefined objects. **Class 3, Lab 2, Credit 4**

**0618-232** **Technical Programming II**  
The second course in a three-course sequence in developing software for the solution of technical applications. Specifically, object-oriented programming of the C++ language will be employed to develop software solutions for engineering and scientific applications. Fundamental data structures (arrays, pointers, records) will be introduced. (0618-231) **Class 3, Lab 2, Credit 4**

**0618-233** **Technical Programming III**  
The final course in a three-course sequence in developing software for the solution of technical applications. Specifically, classical data structures and advanced data types (lists, strings, stacks, queues, trees and graphs) will be studied and employed to develop software solutions for engineering and scientific applications. These applications will include an introduction to numerical methods (i.e., root finding, bisection method, secant method, numerical integration, trapezoidal rule and Simpson's rule) (0618-232) **Class 3, Lab 2, Credit 4**

**0618-301** **Digital Fundamentals**  
A first course in digital fundamentals. Topics include binary arithmetic, Boolean algebra, logic gates, Karnaugh mapping, sequential and combinational logic circuits and an introduction to state machines. (0609-201, 221 or 0609-214; corequisite 0609-215) **Class 3, Lab 2, Credit 4**

**0618-303** **Microcomputers**  
An introductory course involving the hardware and structure of a basic microprocessor-based microcomputer. Emphasis will center on hardware characteristics, design considerations, troubleshooting skills and interfacing principles. (0618-301 and a formal, structured programming course) **Class 3, Lab 2, Credit 4**

**0618-339** **Microcontrollers**  
An advanced course in interfacing microcontrollers to sensors, actuators and input/output devices. Topics include the measurement of light and temperature levels, interfacing issues related to keypads, LCD panels and LED display modules and concepts of analog-to-digital conversion, pulse-width modulation and serial communications. It is assumed that the student is already familiar with assembly and machine language programming of microprocessors. (0618-301 and 0618-303) **Class 3, Lab 2, Credit 4**

**0618-371** **Special Topics**  
Special Topics is an experimental lower-division course intended as a means for offering innovative topics not reflected in the current curriculum. **Class, Credit variable**

**0618-438** **Digital Systems Design**  
An advanced course in the design techniques of complex combinatorial and sequential logic circuits and subsystems. Emphasis is on the use of systematic design procedures for implementing state machine designs. The internal structure and functions of various logic gates and families are analyzed. The problems of interfacing various logic families are discussed. (0618-303, 0609-360) **Class 3, Lab 2, Credit 4**

**0618-439** **Principles of Electronic Design Automation**  
An advanced course in the VHSIC hardware descriptive language (VHDL). The course provides an in-depth coverage of the language and describes the VHDL design environments that will be used for synthesis and verification. Topics include the behavioral, dataflow and structural modeling of both combinatorial and sequential logic, design methodologies, synthesis and optimization. An IEEE-1076 standard VHDL development system will be extensively utilized to synthesize VHDL for PLD, CPLD and FPGA applications. (0618-438 and a formal, structured programming course) **Class 3, Lab 2, Credit 4**

**0618-499** **Computer Engineering Technology Co-op**  
One quarter of appropriate work experience in a computer-related industry. (0618-339, 0618-233, 0609-407 or permission of academic adviser) **Credit 0**

**0618-502** **Verilog Design I**  
An introductory course in the Verilog language. The course provides an in-depth coverage of the language and describes the Verilog design environments that will be used for synthesis and verification. Topics include the behavioral, data-flow and structural modeling of both combinatorial and sequential logic, design methodologies, synthesis and optimization. Verilog development system will be extensively utilized to synthesize FPGA applications. (0618-438 and a formal, structured programming course). **Credit 2**

**0618-503 Verilog Design II**  
An advanced course in the Verilog language. The course provides an in-depth coverage of the language and describes the Verilog design environments that will be used for synthesis and verification. Topics include the behavioral, advanced testbenching techniques, file IO, memory models, clock generation models, self-checking testbenches, regression testing and synthesis techniques—designing for speed and cost. Project-based labs targeting the Spartan II family of Xilinx FPGAs. Advanced FPGA techniques, delay lock loops, IO configuration, constraints and static timing and gate simulations. Complex RTL design project using hierarchy and multiple designers on a project. Configuration management and coding standards. (0618-502) **Credit 2**

**0618-561 Embedded Systems Design I**  
A beginning course in embedded systems architecture. This is the first in a three-course sequence. System design principles are developed and analyzed. Formal modular assembly language and C are studied for embedded systems. Focus is on monitor operations and peripheral interfacing. Students design and debug hardware and software to augment an existing system. (0618-438 and a formal, structured C or C++ programming course) **Class 3, Lab 2, Credit 4**

**0618-562 Embedded System Design II**  
This is the second of a three-course embedded systems sequence. General hardware and software principles are expanded upon as students build their own 32-bit microprocessor-based system from the ground up. Debugging techniques unique to a new system design are explored in detail as students bring to life a completely untested system. Concepts such as dynamic bus sizing, burst accesses, interfacing to a standard bus and design for test and manufacture are covered in detail. (0618-561 and a formal, structured C or C++ programming course) **Class 3, Lab 2, Credit 4**

**0618-563 Embedded System Design III**  
This is the final course in a three-course embedded systems sequence. Students expand upon the 32-bit microprocessor-based system they built in 0618-562. More complex peripherals, cache principles, multi-master systems, arbitration and resource sharing and bus standards are covered in detail. (0618-562 and a formal, structured C or C++ programming course) **Class 3, Lab 2, Credit 4**

**0618-580 Senior Project**  
A course that provides the student an opportunity to pursue a supervised design project of mutual interest to him/herself and the sponsoring faculty. The design project must be within the computer engineering technology discipline. (Fifth-year status in the computer engineering technology program) **Credit 4**

**0618-596 Honors Independent Study**  
This course allows upper-class computer engineering technology Honors students the opportunity to independently investigate, under faculty supervision, aspects of the computer industry that are not currently covered in existing courses. Proposals for an Honors independent study must be approved by the sponsoring faculty, the computer engineering technology program chair and ECT-ET Honors advocate. **Credit variable 2-4**

**0618-599 Independent Study**  
This course allows upper-class computer engineering technology students the opportunity to independently investigate, under faculty supervision, aspects of the electrical industry that are not currently covered in existing courses. Proposals for an independent study must be approved by both the sponsoring faculty and the computer engineering technology program chair. **Credit variable 2-4**

## Hospitality Management

**0619-220 Survey of Service Industry**  
Seminar designed to define career opportunities in the hospitality, nutrition and service management industries. Students receive guidance in developing career objectives. Leading industry executives participate. **Class 2, Credit 2**

**0619-221 Basic Computer Applications**  
This course teaches students basic computer applications used in the service industry. Emphasis is on word processing, spreadsheets and computer-developed presentations. Students have projects and tests in each of the three areas. **Class 2, Credit 2**

**0619-320 Global Standards in the Service Industry**  
Globalization of commerce carries with it increasing global standards. This course examines different kinds of standards, especially those related to international trade and commerce. Students are expected to identify situations in which standards are mandated, identify the relevant standards and then describe the applications of the appropriate standards. The course also looks at current issues and emerging trends in standards. **Credit 4, Class 4**

**0619-322 Service Management in a Global Economy**  
This course is an introduction to the basic concepts of service quality management and the service economy in the United States and worldwide. A large proportion of the U.S. economy is based on purchase of services, including information, hospitality, business, education and training, financial, design, consulting, and legal services. Demand for quality service experiences is expanding globally. Developing and managing appropriate high quality, personalized service offerings is critical to business success. Concepts of designing, implementing, monitoring, and evaluating quality in services delivery will be explored. **Class 4, Credit 4**

**0619-410 Assessing Service Quality**  
Excellence in customer service is the hallmark of success in service industries. But what exactly is service excellence? This course surveys the various issues related to measuring customer satisfaction. It examines those issues that cause service quality problems and what service organizations can do to solve these problems and improve service. Guidelines for developing questionnaires are discussed, with emphasis on issues of reliability and validity. The role and mechanisms associated with focus groups are addressed. (1016-319 or permission of instructor) **Class 4, Credit 4**

**0619-426 Technology in Service Systems**  
Predicting the future ... adapting to change ... connecting and communicating ... lifelong learning. A fundamental societal revolution has begun that is changing the nature of work and leisure. Explore the emerging and future work worlds, consumer trends and the technologies that are changing the way society works. Emphasis is on technologies impacting the food, nutrition, hotel and travel service industries. Technologies explored may include those associated with communication, information retrieval, imaging, marketing, employee training, product quality, production customization, customer service, security, health, entertainment and customer interface, as time permits. Student teams will chart the flow of product/service systems and identify technologies to enhance them to meet customer needs. Individual (personal) and team (business) websites will be constructed. **Class 4, Credit 4**

**0619-470 Leadership in Service Culture**  
The leadership and executive development course prepares you to assume leadership and management roles as you prepare to enter the work force. Principles, applications and exercises specifically designed around hospitality and tourism industry examples will enable you to more effectively progress as future leaders and managers in the hospitality and tourism industries. You also will begin to establish your own personal leadership and management style based on examples and exercises. The course makes extensive use of lectures, laboratories and industry expertise. **Class 4, Credit 4**

**0619-480 Human Resource Management**  
This course presents hospitality and service management students with a complete repertoire of human resource management (HRM) issues. It addresses all the current HRM topics and is designed to enhance the student's ability to deal effectively with HRM topics. The laboratories attempt to develop conceptual thinking abilities. The course also focuses on HRM training techniques—an area of specific concern in the hospitality industry. By emphasizing various training techniques and practices, highly skilled graduates can immediately employ one of the hospitality industry's most valuable tools—training to aid in the retention and management of human resources. The course makes extensive use of lectures and laboratory exercises. **Class 4, Credit 4**

**0619-490 Senior Project**  
A capstone course that explores the integration of disciplines in addressing problems and issues facing the service/hospitality industries. Students have the opportunity to identify and investigate (as individual projects) challenges to these industries. Various modes of research, problem-solving techniques and presentation styles are utilized. Students also have the opportunity to select a faculty mentor. The class culminates with a presentation made by the student to peers and faculty. Fulfills department writing requirement **Class 4, Credit 4**

**0619-501** **Service Management**  
This course is designed to evaluate management software applications, new service technologies and best management practices and implementation of strategies in hospitality and service organizations. Students will interact with departmental managers, hospitality and service management faculty and various market segments in order to gain experience in a service environment. **Class 1, Lab 3, Credit 2**

**0619-506** **Franchising in the Service Sector**  
Franchising has been a successful method for business expansion. This course covers the advantages and disadvantages of franchising as well as the key factors in obtaining, developing and operating a franchise operation that meets specific customer needs. Legal and financing issues are also covered. Major project developing a franchise plan is required. **Class 4, Credit 4**

## Nutrition Management

**0620-210** **Nutrition and the Mediterranean Diet**  
The focus of this course is on understanding the unique characteristics of the Mediterranean diet and the effects on one's health of adhering to it. The course will compare the Mediterranean diet to other ethnic cuisines and food guide pyramid tools. The student will become familiar with foods typically consumed on the Mediterranean diet and will demonstrate recipes using these foods. The course will evaluate the various oils used in Mediterranean cooking. For a culminating experience, the student will develop a one-week menu featuring the key characteristics of the Mediterranean diet, including nutritional analysis. Principles of the diet will be introduced via weekly lecture and labs will provide a hands-on application of topics discussed in the lecture. **Credit 4**

**0620-213** **Contemporary Nutrition**  
The study of specific nutrients and their functions; physiological, psychological and sociological needs of humans for food; development of dietary standards and guides; application of nutritional principles in planning and analyzing menus for individuals of all ages; survey of current health nutrition problems and food misinformation. **Class 4, Credit 4**

**0620-300** **Sports Nutrition**  
This course will provide an introduction to the integration between exercise and nutrition-related topics by exploring the intimate links among nutrition, energy metabolism and human exercise response. The course content will sort fact from fiction and help students and practitioners obtain the knowledge they need to give sound advice to athletes and active individuals. (1026-305 or college-level science) **Class 4, Credit 4**

**0620-402** **Dietetic Environment**  
Introductory supervised practice course. Students interact with a representative sampling of personnel in all areas of food and nutrition. Supervised observations are planned in food management systems, health care facilities and community nutrition programs. Practicum hours by arrangement. Nutrition majors only. **Class 1, Credit 4**

**0620-510** **Nutrition Alternative Medicine**  
This class offers an overview of controversial and accepted alternative diet therapies, basic medicine guidelines and vitamin/ mineral supplementation. Nutrition majors only. **Class 2, Credit 2**

**0620-519** **Techniques of Dietetics**  
This course teaches dietetic and nutrition specialists to prepare and give presentations for the purpose of informing, persuading and training a variety of audiences. Topics include communication methods, audience analysis, developing communications and training objectives, selecting media, designing and making presentations, evaluating and communications effectiveness. Students are required to make presentations as part of the course. **Class 4, Credit 4**

**0620-525** **Medical Nutrition Therapy I**  
The applied study of metabolism and the interrelationships between nutrients and other biochemical substances in humans. Etiology, symptoms, treatment and prevention of nutritional diseases; evaluation of nutritional status; role of the diet in gastrointestinal, renal, musculoskeletal, cardiac, endocrine, surgical and other diseases. Nutrition majors only. **Class 5, Credit 5**

**0620-526** **Medical Nutrition Therapy II**  
The applied study of metabolism and the interrelationships between nutrients and other biochemical substances in humans. Etiology, symptoms, treatment and prevention of nutritional diseases; evaluation of nutritional status; role of the diet in gastrointestinal, renal, musculoskeletal, cardiac, endocrine, surgical and other diseases. Nutrition majors only. **Class 4, Credit 4**

**0620-550** **Community Nutrition**  
Study of current nutrition problems and delivery of nutrition information and service in the community. Survey of facilities involved in giving nutrition information or nutritional care. Emphasis on acquiring skills necessary for delivering nutrition information and services in traditional and nontraditional markets. Independent practicums involving nutrition care in community facilities are required. Assignments are arranged by the instructor. Practicum hours by arrangement. Nutrition majors only. **Class 2, Credit 4**

**0620-554** **Nutrition in Life Cycle**  
An applied course in nutritional needs throughout the life cycle. Emphasis is given to nutrition during pregnancy, infancy, early childhood, adolescence, young and middle adulthood and the elderly. Practicum in facilities delivering nutrition services to these age groups is required. Practicum hours by arrangement. Nutrition majors only. **Class 4, Credit 5**

## Food Management

**0621-221** **Food Identification and Assessment**  
The focus of this course is on experiencing essential aspects of important food categories. The experiences will include tasting and touching the foods, describing the sensory characteristics of each, observing aspects of production and preparation and some hands-on opportunities for cooking. The food items will be related to the food pyramid nutrition guidelines of the USDA and to current and anticipated food trends and issues. Projects, videos and field trips will be used to maximize student learning. Because foods are rarely eaten alone, information on pairing of various food items with each other and with wines will be included. Food categories will include fruits, vegetables, meats, seafood, dairy products, oils, chocolate, breads, pasta, grains and rice. Common specifications, safety issues, cultural connections and information on processing will be covered as appropriate to each category. **Credit 4**

**0621-225** **Principles of Food Production**  
Introduction to the basic principles involved in the preparation of high-quality food. Topics include product identification, market forms, varieties' availability, composition, standards of quality, preparation techniques and function of foods and ingredients. Standard methods of preparation will be introduced. Professionalism in appearance and work habits, self-organization, sanitation, management, team work and techniques for efficient food production are stressed. Uniform and professional knife and pastry kits are required. **Class 2, Credit 4, Lab 4**

**0621-310** **Commodity Market Analysis**  
An overview of the commodity futures and options market. Special emphasis on the fundamental economic factors affecting agricultural and energy-based futures prices. The economic principles and policies supporting hedging and speculating strategies are analyzed. Students are introduced to technical price analysis, basis analysis and global economics of foodservice commodities. **Class 4, Credit 4**

**0621-314** **Sanitation and Safety**  
Survey of micro-organisms of importance to the food industry; emphasis on causes and prevention of food spoilage and poisoning. Responsibilities of management to provide and establish safe working conditions and policies; discussion of current problems confronting the industry as a result of recent legislative developments as they relate to safety and health. **Class 2, Credit 2**

**0621-315** **Foodservice Marketing**  
Provides students with a business-to-business perspective of the marketing of products to the foodservice industry. Also provides an understanding of distribution systems and foodservice marketing environments. Both macro and micro marketing environments and issues are explored. The class considers various marketing mix elements as they relate to segments of the foodservice industry. Case studies and readings are utilized to give students realistic opportunities to analyze and develop practical solutions. **Class 4, Credit 4**

**0621-318** **Food and Beverage Marketing**  
An introductory course involving the basic principles involved in the management of food and beverage operations. Topics include food and beverage marketing, menu planning, nutrition principles, staffing, cost, production and preparation procedures, service and design. Both commercial and non-commercial food operations will be discussed. **Class 4, Credit 4**

**0621-321** **Menu Planning and Merchandising**  
The menu is the main focus of the foodservice operation and its relationship to efficient operation, merchandising, theme and customer satisfaction is considered. Truth in menu issues, layout, copy writing, standardized recipes and pricing techniques are explored. A wide variety of menus are critiqued. The student plans and produces a menu for a theme restaurant and also creates a cycle or other menu for a specific customer and situation. **Class 2, Credit 2**

**0621-324** **Food Purchasing**  
Principles of foodservice purchasing; selection and procurement, distribution systems and the purchasing function and activities. Topics include measurement, foodservice purchasing terminology, organization, specifications, recipe standardization, recipe conversion, optimal purchasing practices and purchasing principles for major food commodity categories, including government and industry standards. **Class 2, Credit 2**

**0621-331** **Restaurant Operations**  
Entry-level production and service skills for line positions currently used in the hospitality industry. Laboratory assignments are in the operation and maintenance of Henry's, a full-service restaurant modeled after industrial, hotel and restaurant operations. Students are assigned to defined job descriptions in production and service on a rotating basis. (0621-225, 314) **Class 3, Credit 6**

**0621-334** **Integrated Service Management**  
Students will develop management, marketing and customer service skills appropriate for current and future hospitality industry environments. Laboratory assignments are designed to develop front-of-the-house operation and management skills, including the adaptation of new technologies to foodservice businesses. Henry's, a full-service restaurant modeled after industrial, hotel and restaurant operations, is the laboratory setting. Students will be asked to define roles needed to operate and market Henry's restaurant and to create individual professional goals and objectives that they will meet during the quarter. **Class 4, Credit 4**

**0621-410** **Food Processing and Quality Assurance**  
An introduction to traditional and contemporary food processing methods with emphasis on applications to foodservice operations. The effect of these technologies on the storage life and sensory qualities of the products is examined along with common modes of quality loss in foods. Students are introduced to industry-standard quality assurance measures. **Class 4, Credit 4**

**0621-416** **Product Development**  
Students will explore their creativity through instructor- and student-planned experiments involving sensory and objective evaluation of food quality, recipe development, problem solving, experimental design and written and oral communication of research. Individual research projects focus on assessing new ingredients or technologies, creating new products and/or evaluating the marketability of new products. (0621-225) **Class 2, Credit 4, Lab 4**

**0621-424** **Food and Labor Cost Control**  
Deals with industry-related problems. Combines classroom study of the fundamental principles of costs and controls as applied by management, with on-location application of financial practices and specialized methods and techniques utilized in solving cost and management problems in the hotel/motel and foodservice industries. **Class 4, Credit 4**

**0621-499** **Cooperative Education**  
Career-related work experience. Employment within the hospitality and service management industry monitored by the office of cooperative education and career services and the hospitality and service management program. Designed for the student to experience progressive training on the job as related to the academic option. Freshmen begin co-op the summer following their first-year studies. Graduation requirement. **Credit 0**

**0621-501** **Wines of the World**  
An introduction to wines: history, points of origin, production, handling techniques, flavor characteristics and commercial value. Includes guest speakers and sampling of products. Lab fee required. **Class 2, Credit 2**

**0621-502** **Decorative Techniques**  
Introduction to techniques of food decoration with emphasis on elementary and advanced pastry-bag work, design and color in the creation of special-occasion cakes, molding of gum paste, marzipan and pulled-sugar decorative items and the art of molded and piped chocolate pieces. Students design and create four projects representing these skills. **Lab 4, Credit 2**

**0621-504** **Wines of the World II**  
A further exploration into wines: history, places of origin, production, handling techniques, flavor, characteristics and commercial value. Includes guest speakers and sampling of products. (0621-501) Lab fee required. **Class 2, Credit 2**

**0621-506** **Wine Connoisseur**  
The technical aspects of wine production and marketing are presented by a variety of experts in their field. Topics include the annual crop cycle in the vineyard, terroir—the effects of environmental factors on the grapes and wine—a comparison of European and American wine production techniques, blending and aging wine—including oak barrels vs. stainless steel vats—the wine business, wine trends and wine futures. Lab fee required. (Wines of the World I) **Class 2, Credit 2**

**0621-508** **Beers of the World**  
An introduction to beers: history, the brewing process, distribution systems, production, flavor characteristics, partnering with foods, handling and serving techniques. Beers produced from the major beer brewing centers of the world will be tasted and compared with similar brews from different countries. The way alcohol is processed in the human body is considered and the economic impact of brewing and distributing beer will be explored. Lab fee required. **Class 2, Credit 2**

**0621-509** **Foods of the World**  
This course is an introduction to many different cuisines from around the world. An exploration of indigenous ingredients, dishes, growing conditions. Customs and special food techniques of various cultures will be addressed. Lab fee required. **Class 2, Credit 2**

**0621-512** **Design and Layout of Foodservice Operations**  
Evaluation of different foodservice facilities with regard to design and layout. Review of layouts in operating full-service facilities and suggestions for innovative ways to utilize the space to its fullest potential. (0621-331 or permission of instructor) **Class 2, Credit 2**

**0621-513** **Wine and Food Pairing I**  
This course is an introduction to food and wine pairing. Students will experience "what grows together, goes together" and discover how regional wines and foods have a natural affinity for one another. Students will design their own four-course menu. This course experience includes food and wine sampling, cooking demonstrations and guest speakers. Lab fee required. **Class 2, Credit 2**

**0621-525** **Restaurant Management**  
Students develop entry-level management competence through the operation of a full-service restaurant with beverage operations. Students rotate through various management positions for exposure to four major areas: planning, organization, leadership and control. Use of the school's computer lab in planning is an integral part of the course. **Class 2, Credit 6**

**0621-554** **Special Topic Classes**  
A variety of courses are offered under this course number. Titles will appear in the course listings each quarter. The course may be taken more than once as the topics change. Contact the department for a course description of a specific title. **Credit 1-4**

**0621-599** **Independent Study**  
The student will work independently under the supervision of a faculty adviser on a topic not covered in other courses. The proposal must be signed by a faculty member. **Credit 1-6**

## **Hotel and Resort Management**

**0622-200** **Hotel Operations**  
Introduction to the distinctive nature of hotel operations through identifying the standard interrelated functions that produce the whole hotel service. The hotel's principal product, the guest room, is given detailed study as well as the various forms of business organization that comprise the accommodation sector of the hospitality industry. **Class 4, Credit 4**

**0622-205** **Hospitality Industry Real Estate**  
Provides the student with insight into the development of hospitality real estate and the elements that contribute to decisions on construction, development and expansion of properties. Attention is given to site selection and development processes as they relate to the commercial hotel, resort, foodservice and travel locations. Contributing elements of market conditions, financial feasibility, construction needs and property sizing are explored. **Class 4, Credit 4**



**0622-110** **Hotel Marketing and Sales Management**  
Introduces the student to the application of marketing concepts in hotel operations and the visitor industry. Included are conventions and visitors' bureaus, hotels and convention centers. This is accomplished by defining the marketing function, situation analysis, marketing organization, sales office work flow, customer contact methods and servicing procedures generally practiced in the hotel industry. **Class 4, Credit 4**

**0622-310** **Resort Development and Management**  
Gives the student an understanding of how resort and hotel properties are developed as tourist and business destinations. Focus is on the planning, development, operation, design and special needs of recreational surfaces and financing of such properties. As part of this study, students select a specific type of property and analyze the methods used to develop it. **Class 4, Credit 4**

**0622-315** **Facility and Property Management**  
Provides the student with information on the maintenance and engineering discipline in hotel and resort facilities. Management and administrative practices, life safety concepts, energy monitoring, computer applications and budgeting in the realm of hotel maintenance are studied. **Class 4, Credit 4**

**0622-355** **Financial Management for Hotels**  
Presents hospitality and service management students with accounting and finance concepts that are essential in hospitality management. Hotel accounting principles, income statement analysis, industry-accepted ratio analysis, operational forecasting and budgeting strategies are examined. (0101-301 or permission of instructor) **Class 4, Credit 4**

**0622-420** **Hospitality Law**  
This course introduces the student to contract, tort and agency law as they relate to the hospitality industry. The course covers the legal rights and responsibilities of patrons and owners as they relate to public accommodations, providers of transportation and livery and common law. The course focus is on civil rather than criminal law. A considerable amount of case work is anticipated in this course that should enable students to develop a preventative attitude toward liability and assumption of responsibilities. **Class 4, Credit 4**

**0622-510** **Convention Management**  
Provides the student an opportunity to explore the function of conventions from the point of view of the convention center manager. Consideration is given to various methods used to sell a location to a planner and the servicing of large groups. Also included are the identification of vocabulary and the role of the meeting planner as a force in convention marketing. Trade shows, floor layouts and local codes affecting conventions also are reviewed. **Class 4, Credit 4**

**0622-534** **Space Tourism Development**  
This course extends the boundaries of traditional hospitality and tourism planning and management. Students will explore the unusual and often unique factors of hospitality and tourism management in an earth orbit habitat (like the international space Station) or other celestial bodies (like the moon or an asteroid). Students will investigate market demand for tourism and business and compare it with the plans and objectives of organizations already developing space tourism. Students will make recommendations for future development in one or more areas in the earth terrestrial habitation and tourism. **Class 2, Credit 2**

**0622-540** **Risk Management**  
An examination of the environment in which the hospitality manager functions. Focus is on the management of risk as part of operations. The implications of tort and contract law specifically relating to the industry are undertaken and an explanation of how persons may avoid exposure to risk is made. These methods include forms of insurance, hold-harmless clauses and management decisions on the importance of coverage given different degrees of risk. **Class 4, Credit 4**

**0622-550** **Casino Management I**  
This course gives students an advanced introduction to the casino environment. After satisfactorily completing this course, students will have a strong working knowledge of casino operations and the interrelationship of the casino with other major departments (lodging, food, beverage, entertainment, etc.). Topics include the history of gaming in America, recent trends that impact growth and acceptance rates of legalized gaming, the rules and protection of table games, the various types of "slots," the role of computerized information systems, layout and design within a casino operation, surveillance in a casino environment, casino accounting and back office procedures, consumer behavior, casino marketing strategies, gaming regulations and economic impact issues. **Class 4, Credit 4**

**0622-552** **Casino Management II**  
This course gives students an advanced introduction to the casino environment. After satisfactorily completing this course, students will have a strong working knowledge of casino operations and the interrelationship of the casino with other major departments (lodging, food, beverage, entertainment, etc.). Topics include casino marketing strategies, gaming regulations and economic impact issues. **Class 4, Credit 4**

## Travel and Tourism Management

**0623-206** **Distribution Systems**  
A functional approach is used to describe the market distribution channels for service industry inputs and products/services. The role of retail and business travel agents, tour wholesalers and operators and specialty channelers such as meeting planners, convention bureaus and corporate travel buyers, food processors, producers, distributors and transportation suppliers are discussed. Various economic models are examined in order to analyze the pricing structure associated with the selling and distribution of service industry inputs and outputs. The service philosophy and its application to distribution in the travel/tourism and foodservice industries are explored. **Class 4, Credit 4**

**0623-375** **Travel Destinations**  
Geographers are concerned with the physical, political and cultural composition of the world. Geography is a field in which the concerns of both the social and physical sciences converge in the study of specific places. Touristic geography applies these themes to the travel, tourism and transportation industries. It is also concerned with the social, cultural and economic environmental aspects of places. The identification of major touristic locations as attractors of people's leisure time, energies and interests is the basis of this course. **Class 4, Credit 4**

**0623-410** **Meeting and Exposition Management**  
Introduces the student to the field of meeting management. We take the point of view of a corporate or independent meeting planner in examining the various phases of meeting planning. Students also examine the formulation of goals and how meetings may be evaluated from both a return-on-investment perspective and the satisfaction of the attendees. Computer programs are investigated and tested and a variety of budget strategies are examined. **Class 4, Credit 4**

**0623-418** **Corporate Travel Planning Marketing**  
This course focuses on the specific goals and objectives required to develop control and evaluate guidelines established by corporate travel departments and how to market these programs to the organization. Three major orientations of corporate travel are examined: purchasing travel services, the corporate travel communications process and the evaluation and acceptance of globalized corporate travel service. Emphasis will be on the forging of partnerships within these relationships. **Class 4, Credit 4**

**0623-438** **Tourism Planning and Development**  
Examines the processes involved in planning and developing a tourist destination, including the required infrastructure. A major focus is on benefits and impacts associated with tourism development as well as the strategies for maximizing benefits and minimizing adverse effects. **Class 4, Credit 4**

**0623-522** **Negotiation and Conflict Management**  
Examines the negotiation process within the hospitality/tourism industry by exploring the nature and sources of interpersonal conflict and its dynamics. Collaborative versus competitive approaches to managing conflict are discussed. Role-play situations are used to differentiate and reinforce negotiation strategies. **Class 2, Credit 2**

## Human Resource Management

**0626-234** **Interviewing Techniques**  
A practical approach to interviewing techniques with emphasis on role plays and case studies. Coverage includes employment, disciplinary, counseling and performance appraisal interviews. **Class 4, Credit 4**

**0626-239** **Human Resources Administration**  
An introduction to human resource administration, including an overview and discussion of employment, equal employment opportunity, job evaluation, training, performance appraisal, compensation, benefits, personnel planning, labor relations and related topics. **Class 4, Credit 4**

**0626-333 Compensation Administration**  
The course is designed to acquaint the student with the practical problems of employee compensation. Topics include compensation issues and theory, compensation as a motivator, wage and salary levels and structures, individual wage determination and indirect compensation. (0626-239) **Class 4, Credit 4**

**0626-390 Compensation and Benefits Administration**  
An examination of the general structure of an organization and the rewards employees seek in exchange for the efforts and contributions they provide. Topics will include: rewards and motivation; government and market influence; job content analysis, description and evaluation; developing pay structures and administering them; pay for performance; the range of benefit programs; choosing and administering benefit programs for your organization; the relationship between compensation and benefits; employee expectations; costing of benefit programs. **Credit 4**

**0626-427 Employment Law**  
Employment Law provides knowledge of legislation relevant to human resources, including the Fair Labor Standards Act, Equal Pay Act, Title VII of the Civil Rights Act of 1994, Age Discrimination in Employment Act, Occupational Safety and Health Act, Americans with Disabilities Act, Family Medical and Leave Act and legislation relevant to labor relations, including the Wagner and Taft-Hartley acts. Students learn the legal status, their application in an employment context, ramifications of not complying with the law and how the courts have interpreted the laws. (Human Resource Management 0619-480) **Class 4, Credit 4**

**0626-428 Training Design and Delivery**  
The new workplace requires new solutions. In this environment, training that is well-planned, presented and meets organization needs takes on a critical strategic role. This course is aimed at managers, team leaders, HR specialists and those involved in the continuous, self-directed, formal and informal learning needed to help their organizations improve their business success. Core topics include design and delivery of training, the needs assessment process, job and core competencies analysis, targeting learner needs, training program design and program development issues. **Credit 4**

**0626-433 Benefits Administration**  
A study of the theory, design and practical administration of employee benefit plans, including paid excused time, health care, capital accumulation plans, life insurance, retirement, Social Security and other related benefits. Government regulations as well as issues and trends will also be covered. (0626-239) **Class 4, Credit 4**

**0626-434 Advanced Human Resources Administration**  
Study of application of advanced principles and techniques of personnel administration to particular firms and special personnel problems. Extensive use of individual and group projects as well as case studies. (0626-239 or equivalent) **Class 4, Credit 4**

## **Environmental Management and Safety**

**0630-200 Environmental Health and Safety Seminar**  
This course will present the key principles of environmental health focusing on human life and the support of human existence. Since most of what we do in the environmental arena can be reduced to basic human needs and desires, and all of what we do in the occupational health and safety arena is concerned with the human condition, this will provide an appropriate basis upon which to introduce students to these vital disciplines. **Class 2, Credit 1**

**0630-350 Solid and Hazards Waste Management**  
An examination of strategies and technologies currently in use for reducing, recycling, handling, treating, storing and disposing of solid and hazardous waste in industry. Associated environmental impacts, regulatory concerns, technical feasibility and costs are considered. Students learn to identify applicable environmental regulations and monitoring and measurement requirements, and develop strategies for managing wastes and protecting human health and the environment. (0630-201, 1011-211) **Class 4, Credit 4**

**0630-352 Industrial Wastewater Management**  
Investigates characteristics and sources of industrial wastewaters, related environmental impacts, regulatory implications, and technical considerations of current treatment and disposal methodologies. Students learn to identify appropriate methods, technologies and sequences for source reduction, treatment and pretreatment, direct discharge and management of associated industrial wastewater treatment plant sludges. (0630-201,1011-211) **Class 4, Credit 4**

**0630-354 Air Emissions Management**  
This course will provide an overview of industrial air pollution and its sources. Subjects covered will include the history of air pollution, the chemistry and effects of pollutants, regulations and standards, control technologies, air quality management and global concerns and trends. (0630-201) **Class 4, Credit 4**

**0630-360 Environmental Monitoring and Measurement**  
An in-depth view of environmental monitoring and measurements, giving the student the knowledge to plan, execute and interpret a sampling project. Covers techniques for sampling air, soil, surface water and groundwater with an emphasis on remedial investigations and contaminated sites. Students learn to plan sampling events, collect quality assurance/quality control samples, determine correct sampling technique and specify analysis. (1011-211, 213; 1001-201; 0630-380, 382) **Class 4, Credit 4**

**0630-370 Environmental Geology**  
This course covers many subtopics within the broad field of geology. Students will learn the theoretical background, and practical applications of the science. Topics include internal earth forces, geological materials and resources, surface processes, and geologic waste disposal. Geology has important applications to environmental management, and these applications will be highlighted in the class. Geology is a descriptive science so students will learn a great deal of new vocabulary, and will come to understand the mechanisms and results of continuous change to our planet. **Class 3, Credit 3**

**0630-372 Environmental Geology Lab**  
Laboratory to accompany 0630-370, Environmental Geology. Lab includes field trips to significant local geologic features and mines. (Credit or co registration in 0630-370) **Class 2, Lab 3, Credit 1**

**0630-380 Introduction to Hydrology**  
This course will cover most subdisciplines within the broad field of hydrology. Students will learn the theoretical background, and practical applications of selected aspects of the science including the hydrologic cycle, surface water calculations, vadose zone flow, groundwater hydraulics, groundwater monitoring, water chemistry and groundwater contaminant transport. The class culminates in an investigation of a mock contaminated site in which the students apply aspects of all of the above mentioned topics. Hydrology has important applications for environmental managers, and these applications will be highlighted in the class. (0630-370,372) **Class 3, Credit 3**

**0630-382 Introduction to Hydrology Lab**  
Laboratory to accompany 0630-380, Introduction to Hydrology. The lab focuses on field and computational techniques. Field activities include stream gauging in Oatka Creek and well installation. (Credit for or coregistration in 0630-380) **Lab 3, Credit 1**

**0630-440 Environmental Permitting**  
This course will provide a practical knowledge of Federal and State environmental permitting processes and procedures. Regulatory requirements will be reviewed with emphasis placed on the major programs in New York State, including Water, Air and Solid and Hazardous Waste. Students will become familiar with the environmental review and audit as a part of the application process. Discussion will introduce the environmental permit as a management tool for the environmental professional. The use of facility audits, development of proper information for permit applications and negotiation of permit terms and conditions will be explored as means to assure compliance with State and Federal statutes. The course will also explore the consequences of non-compliance with regulations by presenting enforcement options available to government agencies. (Open only to fourth-year environmental management majors with department approval) **Class 4, Credit 4**

**0630-444 Remedial Investigation/Corrective Action**  
Delineates and describes the sequence of events required in remedial investigations (RI), feasibility studies and corrective actions at hazardous waste sites. Explains the process flow logistics, concepts and rationale behind each RI action. Investigates the strategies, technologies and methodologies commonly in use for site investigation and characterization and corrective action. Explores current issues of "how clean is clean?" and "Superfund" liability. Students learn to develop conceptual site characterization plans; effective solicitations for RI proposals; review and evaluate work plans, procedures and operations plans, and contingency plans. (Open only to fourth-year environmental management majors or with departmental approval) **Class 4, Credit 4**

**0630-450 Occupational Health**  
This course will provide students with an overview of the fundamentals of industrial hygiene. Emphasis will be placed on the toxicological effects of various industrial substances on the body; monitoring and personal sampling for these substances and personal protection against such substances. (1011-211, 1001-201, 1017-211) **Class 4, Credit 4**

**0630-451 Occupational Health Lab**  
Hands-on practical hazardous material response. Must be taken in conjunction with 0630-450 or with permission of the instructor. **Credit 1**

**0630-454 Occupational Safety**  
This course is an overview of the safety management tools utilized in today's industry. Students are expected to have a foundational knowledge of safety management techniques upon completion of this course. Topics examined include recordability and safety indices; incident investigation; guarding, electrical and material handling; welding, fire prevention, excavation; medical surveillance and worker's compensation; inspection techniques and auditing; committee's incentives and voluntary programs. **Class 4, Credit 4**

**0630-465 Product Stewardship**  
This course examines the principles of product stewardship. The ethical, legal, liability and economic issues which product manufacturers face will be covered. In addition students will be exposed to the methods used to identify and manage product environmental, health and safety (EHS) issues in today's world. The concept of sustainability will be covered and students will learn the principles of product life cycle assessment. Students will also learn and use specific EHS analysis techniques. Case studies will also be reviewed. This course is open to fourth and fifth year engineering technology, packaging science, safety technology and environmental management and technology students who have completed at least one co op or with permission of the instructor. **Class 4, Credit 4**

**0630-480 Environmental Regulatory Law I**  
An overview of environmental law and regulatory activities at the federal and state levels, with emphasis on New York State. Topics include a review of the historical and modern sources for environmental protection and regulation, including Federal and State roles, the responsibilities of the separate branches of government and the emergence of administrative law. The class will discuss how the current enthusiasm for private property concepts, state's rights and deregulation are being used to limit or revise existing environmental programs. In addition, the environmental review and permitting process will be discussed, using New York State and DEC procedures as representative models. Open only to fourth-year or fifth-year students. **Class 4, Credit 4**

**0630-490 Project Management**  
This course has been designed to give the student an overview of the fundamental concepts of modern project management. Areas of focus include: the Project Life Cycle (PLC), the Project Management Body of Knowledge (PMBOK), Review Technique (PERT), Critical Path Method (CPM) and various budgeting and resource allocation techniques. Discussion of project management organizations, negotiation and conflict resolution and project termination will be included, along with an introduction to Project Management Institute (PMI) and Microsoft Project for Windows. (Open only to upper division students) **Class 4, Credit 4**

**0630-500 Environmental Study Elect**  
Special topics are courses offered periodically. Watch for the titles in the course listing each quarter. Examples include alternative energy, contaminate hydrology and wetland delineation. **Class 4, Credit 4**

**0630-505 Resource Reduction**  
This course will focus on strategies for reducing the use of material and environmental resources. It builds upon environmental management & technology courses for controlling air emissions, wastewater and solid and hazardous waste and moves upstream into the production process to reduce or eliminate waste by not producing it in the first place. Students learn how to conduct resource reduction assessments and identify opportunities to reduce or conserve resources. This course will take you beyond end-of-the-pipe controls and look at life cycle assessment as an environmental management tool. (0630-350, 352, 354) **Class 4, Credit 4**

**0630-509 Senior Project Planning**  
This individualized course prepares the student for the senior project, 0630-511. **Credit 1**

**0630-511 Senior Project**  
Consists of independent work demonstrating the ability to solve a significant safety or environment management problem in a comprehensive fashion. The problem will focus on future or emerging technologies as well as current techniques. (0630-509) **Credit 3**

**0630-515 Corporate Environmental Management**  
Presents the fundamentals of how companies manage their environmental issues. Explores regulatory and environmental motivations and strategies for corporate environmental management. Identifies organizational considerations in managing corporate environmental programs. Introduces concepts of total quality management and its applications to corporate environmental problem solving. The course focuses on elements of environmental management systems including: environmental policies, codes of conduct, setting objectives and targets, implementing programs, and evaluating and auditing environmental performance. The course also addresses the environmental manager's role in training and corporate environmental reporting. (Open only to fifth-year environmental management majors) **Class 4, Credit 4**

**0630-521 Environmental Health/Safety Engineering Technology**  
Today's professional engineers and technologists face ethical, legal and economic responsibilities to incorporate environmental protection, health and safety (EHS) elements into the design of products, activities and services of the organizations they serve. This course will provide engineering technology and other technology students with an overview of key EHS issues. This course will also provide students with an awareness of the role of EHS professionals, and of the integrated role engineers and technologies play in recognizing and controlling EHS issues. Students will also be provided with an overview of the legal and liability concerns associated with EHS, the principles of incident causation and prevention, the role of perceptions and behaviors (i.e. the human element) in EHS, the identification and control of EHS issues, and the fundamental techniques for managing EHS issues in a cost. **Class 4, Credit 4**

**0630-570 Environmental Risk Management and Communication**  
This course focuses on an overview of risk management systems, risk management systems, risk management and risk reduction strategies, implementation of risk management and risk reduction strategies, and discussion of the principles of risk perception and risk communication. Leading-edge topics such as product stewardship, sustainability, and life cycle analysis are covered in detail including interesting case studies embodying real-life decisions in a corporate environment. Additional discussions on risk analysis, technological risk, cost benefit analysis and decision-making under uncertainty are brought to bear on these techniques where appropriate. **Class 4, Credit 4**

## Safety Technology

**0633-401 Fire Protection**  
Introduces fundamental concepts in protection of industrial workers and property from fire and explosion. Fire chemistry, control of ignition sources in industry, and properties of combustible materials are discussed. Fire detection and extinguishment are covered along with building construction for fire prevention, life safety, fire codes and related topics. (Engineering technology and safety technology students only or permission of department; 0630-454) **Class 4, Credit 4**

**0633-505 Construction Safety**  
The course is designed to cover construction health and safety hazards and study OSHA regulations in depth. Students get to handle and investigate construction safety issues. The topics covered will allow the students to receive an OSHA 30 hour construction outreach training card. The OSHA standards addressing trench excavation, scaffolding, temporary electric circuits, fall protection, HAZCOM, and underground construction are studied. **Class 4, Credit 4**

**0633-526 Occupational Health II**  
The course focuses on industrial hygiene applications and hands on participation. Particular attention will be given to sampling strategies from similar exposure grouping, actual sampling experiences with a wide range of industrial hygiene instruments, and sampling analysis using statistical protocols. Field experience with instrumentation, as well as professional written and oral communication of results is emphasized. There are several out of classroom learning experiences required (team based). This course also explores environmental health engineering applications including ventilation systems, process safety, and inspection/audit protocol skill building for many different types of processes, including: laboratories, machining centers, painting and solvent usage. (0630-450) **Class 4, Credit 4**

**0633-530 Mechanical and Electrical Controls and Stand**  
Discussion of machinery safety with emphasis on hazard analysis, risk estimation, safeguarding techniques and electrical considerations. Particular attention will be paid to applicable OSHA regulations, ANSI, NFPA and EN standards as they relate to wood, metal, films and automation. A portion of the course will change regularly to reflect emerging issues in industry. (Engineering technology and safety technology students only or permission of the department) (0630-454) **Class 4, Credit 4**

**0633-540 System Safety/Incident Investigation**  
Focuses on the evaluation of systems designs using detailed system analysis techniques. Topics covered include system definition, economics of system safety, systems safety methodology, ergonomic approaches, mathematics of system analysis, including statistical methods, Boolean algebra and reliability, preliminary hazard analysis, application of fault tree analysis, and incident investigation. **Class 4, Credit 4**

### Emergency Management

**0633-545 Safety and Health Program Management**  
This course presents an in-depth examination of the concepts, methods and techniques involved in safety & health program management. The strengths and weaknesses of existing safety programs, performance management techniques, behavior-based safety, design safety, legal aspects of safety & health management and emerging trends in safety & health management are covered. This course expands on concepts presented in introductory topics. Case studies are utilized in order to foster application of management techniques and involve the resolution in an ethical manner. (Fourth or fifth year status in Safety Technology) **Class 4, Credit 4**

**0634-311 Earth Science**  
This is the first course in the Emergency & Management Disaster Certificate. Students gain a theoretical understanding of the causes of extreme geological and meteorological events such as earthquakes, volcanoes, landslides, floods, hurricanes, and tornados. Students also research the likely effects these disasters have on populations, infrastructure, and the environment. Significant emphasis is placed on emergency response and the role of the emergency manager in each type of extreme event. **Class 4, Credit 4**

**0634-321 Man-made Hazards**  
This course introduces the fundamental aspects of chemistry using man-made hazards as the vehicle. The course covers the chemistry of hazardous materials, including toxics, caustics, flammables, and their effects on humans. Additionally, the physics of radiation, the design of commercial power reactors, and reactor disaster scenarios is covered in the course. The course uses current events in man-made hazards to facilitate the learning of the chemistry principles behind the events. (Minimally high school chemistry. Recommend college level chemistry) **Class 4, Credit 4**

**0634-401 Emergency Preparedness Law**  
Principle statutes, regulations, and court cases governing emergency preparedness (0634-311 or 321) **Class 4, Credit 4**

**0634-471 Emergency Planning and Methods**  
Comprehensive emergency planning and methods of risk and hazard analysis. Also, turf problems with multi-agency plans, command structures, and the role of new technologies in disaster response. Preparation of hazard analyses and sections of plans for actual communities. (0634-311 or 321 and 401) **Class 4, Credit 4**

**0634-475 Counter Terrorism for the First Responder**  
This advanced course in the emergency and disaster management certificate program uses a technical approach. The course examines the issues of terrorism as they relate to the planners and responders at the local level. The history and patterns of terrorism are examined by reviewing specific incidents. The technical aspects of terrorism are presented for the participants. Concepts of planning for a terrorist incident are presented with emphasis on integrating emergency operation plans. The course will also discuss preparations and guidelines for terrorist attacks focusing on planning problems, countermeasures, response actions and the roles of local, state, and federal government agencies. Policy development related to the media and critical incident stress will be presented. Significant emphasis will be placed on examining incident management tools such as the incident command system. (0634-321 or substantial field experience) **Class 4, Credit 4**

**0634-481 Emergency Operations**  
Roles of fire, police, EMS and volunteer agencies like the Red Cross on disaster sites. Also, command posts and off-site operations centers, the incident command system, and how to critique incidents. (0634-311 or 321 and 401) **Class 4, Credit 4**

### Health Systems Administration

**0635-310 Survey of Health Care Systems**  
An overview of the development, structure and current forces transforming the health care system. Topics include the status of the national and regional populations, physician practice and payment, private and government health insurance, the impact of medical technology, manpower issues, hospital services and reimbursement systems, ambulatory care and alternative delivery systems and mental health and long-term care. (Offered on campus and online) (Previous experience or course work in health care and permission of chair) **Class 4, Credit 4**

**0635-320 Health Systems Administration**  
A survey of administration in health care facilities focusing on the application of general management principles in the unique health care environment. Issues such as organizational structures, planning and performance monitoring, personnel management, finance and the respective roles of medical professional and administrator in managing the facility are discussed. (0635-310, previous experience, course work in health care and permission of chair) **Class 4, Credit 4**

**0635-351 Health Care Economics and Finance**  
An introduction to the efficiency, effectiveness and equity of the new economics of health care; a conceptual and practical knowledge of health care finance, including sources of funding, accounting and reporting; and the influence of third-party payers. No previous work in economics is assumed. (0635-310 or 320) **Class 4, Credit 4**

**0635-421 Legal Aspects of Health Care Administration**  
An overview of statute and regulation as they apply to the health care field. Topics include an overview of the American legal system, licensure of institutions, licensure and discipline of practitioners, physician-patient relationship, reproductive issues, the right to die, organ donations, medical records, legal liability, malpractice and labor law. (0635-310 or 320) **Class 4, Credit 4**

**0635-431 Health Care Quality Assurance**  
An introduction to quality assurance in health care. Course explores past and current definitions of quality and competing concepts of quality assurance; reviews existing quality assurance requirements and accrediting organizations, federal and state agencies and third-party payers; describes and explains quality assurance methods and tools and their application in various settings. (0635-310 or 320) **Class 4, Credit 4**

**0635-441 Health Planning and Program Development**  
A review of the methodology of planning effectively for health care services. The use of data systems, forecasting and identifying and analyzing problems are explored, along with the process of strategic planning, setting priorities, developing projects and allocating resources. Students prepare actual applications for new programs to regulatory agencies. (0635-310 or 320) **Class 4, Credit 4**

**0635-510 Complementary Medicine for the Millennium**  
As the use of alternative and complementary medical treatments grows rapidly among the public and is increasingly found among the therapeutic services offered in conventional medical settings, it is important that the professional health systems administrator and also the lay consumer of medical services have a basic understanding of these alternate treatments and treatment systems. This course will not teach the application of particular techniques or therapies. It is a descriptive and analytic survey and comparison of different approaches to health and healing, the research bearing on their effectiveness and to what extent, clinically and administratively, they can be integrated into conventional medical practice and settings. **Credit 4**

## Reserve Officer Training Corps—Army

**0640-201 Introduction to Military Science/Personal Development**  
Introduces students to the personal challenges and competencies that are critical for effective leadership. You will learn how the personal development of life skills such as goal setting, time management, physical fitness and stress management relate to leadership, officership and the Army professional. Provides a practical introduction to the basic military organization and rank structure; the historical basis for customs and traditions found in the military and current discussions on the military and its impact upon society. **Class 1, Lab 2, Credit 2**

**0640-202 Introduction to Military Leadership**  
The purpose of 0640-202, Introduction to Military Leadership, is to develop basic knowledge and comprehension of Army leadership dimensions while gaining a big-picture understanding of the ROTC program, its purpose in the Army and its advantages for the students. Topics of primary interest include the organization of the U.S. Army, the National Guard, the Army Reserve; career branches; and the role of an officer. Students will explore the many facets of the demanding world of an effective Army officer. **Class 1, Lab 2, Credit 2**

**0640-203 Introduction to Tactical Leadership**  
Overviews leadership fundamentals such as setting direction, problem solving, listening, presenting briefs, providing feedback and using effective writing skills. You will explore dimensions of leadership values, attributes, skills and actions in the context of practical, hands-on and interactive exercises. Other topics of interest are military writing, map reading, orienteering, introduction to tactics and weapons and marksmanship training. **Class 1, Lab 2, Credit 2**

**0640-301 Military Geography**  
A study of military land navigation with special emphasis given to navigation using a map and compass. Geographic concepts and realities are studied as they apply to the solution of military problems. Major topics for discussion include identification of terrain features, use of grid coordinates, polar coordinates, military correspondence and first aid tasks. Stresses practical application rather than theory; leadership lab. Students must register for lab under the department of physical education. **Class 1, Lab 2, Credit 2**

**0640-302 Psychology and Leadership**  
Provides the student with the basic principles of leadership and management of human resources; motivation, morale and communication. Special emphasis is on applying the theories and models of the behavioral sciences and personnel management to leadership as it functions in a military environment; leadership laboratory. Students must register for lab under the department of physical education. **Class 1, Lab 2, Credit 2**

**0640-303 Military and American Society**  
Examines the challenges of leading tactical teams in the complex contemporary operating environment (COE). This course highlights dimensions of terrain analysis, patrolling and operation orders. Continued study of the theoretical basis of the Army leadership framework explores the dynamics of adaptive leadership in the context of military operations. 0640-303 provides a smooth transition into 0640-401. Cadets develop greater self-awareness as they assess their own leadership styles and practice communication and team building skills. COE case studies give insight into the importance and practice of teamwork and tactics in real-world scenarios. Leadership laboratory. Students must register for the lab under the department of physical education. **Class 1, Lab 2, Credit 2**

**0640-401 Military Tactics**  
Stresses practical exercises on basic map-reading skills and provides working knowledge of fundamentals and principles of combat operation as planned for and executed at light infantry squad and platoon level. Leadership laboratory. Students must register for lab under the department of physical education. **Class 2, Lab 2, Credit 3**

**0640-402 Military Communications**  
Provides knowledge and training of basic military skills essential as junior officer; an introduction to military communication equipment and techniques; the leadership communication process. Leadership laboratory. Students must register for lab under the department of physical education. **Class 2, Lab 2, Credit 3**

**0640-403 Military Operations**  
A continuation of military skills training with emphasis on military intelligence/security; operations at the small-unit level; staff functions and leadership laboratory; field training exercise. Students must register for lab under the department of physical education. **Class 2, Lab 2, Credit 3**

**0640-501 Army Training System**  
An introduction to the U.S. Army's training philosophy and training system. Students learn how to assess, develop, plan and evaluate training. Provides instruction in how to plan, conduct and assess a training meeting. Both short- and long-range training plans are developed. The importance and use of the after action review process is stressed and continued refinement of proper military briefing techniques is emphasized. Students must register for lab under the department of physical education. **Class 2, Lab 2, Credit 3**

**0640-502 Military Administration and Logistics**  
Includes discussions and seminars on the Army training management system, military justice, supply and property accountability, maintenance management, officer-enlisted personnel management. Leadership laboratory. Students must register for lab under the department of physical education. **Class 2, Lab 2, Credit 3**

**0640-503 Military Ethics**  
Examines the ideas and issues that define the role of the military in our larger society. Emphasis is on the professional and ethical standards required of the military officer. Other topics include planning and conducting meetings, teaching and counseling, active duty orientation, preparations for commissioning; leadership laboratory and field training exercise. Students must register for lab under the department of physical education. **Class 2, Lab 2, Credit 3**

**0640-510 Senior Project and Seminar**  
For military science students who have completed their junior year of military study. The seminar is directly related to military science projects that students are working on and consists of written and/or oral presentations given during the quarter. Students also may be required to present this material to other students in a classroom environment. Students must register for lab under the department of physical education. **Class 2, Credit 2**

**0640-520 Survey of American Military History**  
A study of American military history from the 1700s to the present day. Discussions will show how military actions affected U.S. history; how developing technologies impacted U.S. military doctrine, tactics and strategy; and the change of the U.S. military from a part-time civilian volunteer militia to a professional full-time force. **Credit 4**

## Reserve Officer Training Corps—Air Force

**0650-210 The Air Force Today I**  
The first in a three-course series designed to introduce students to the U.S. Air Force and Air Force Reserve Officer Training Corps. Featured topics include mission and organization of the Air Force, officership and professionalism, military customs and courtesies, Air Force officer opportunities and an introduction to communication skills. **Credit 1**

**0650-211 The Air Force Today II**  
The second in a three-course series designed to introduce students to the U.S. Air Force and Air Force Reserve Officer Training Corps. Featured topics include mission and organization of the Air Force, officership and professionalism, military customs and courtesies, Air Force officer opportunities and an introduction to communication skills. **Credit 1**

**0650-212 The Air Force Today III**  
The last in a three-course series designed to introduce students to the U.S. Air Force and Air Force Reserve Officer Training Corps. Featured topics include mission and organization of the Air Force, officership and professionalism, military customs and courtesies, Air Force officer opportunities and an introduction to communication skills. **Credit 1**

## Electrical Mechanical Engineering Technology

**0660-401 Thermal Fluid Science I**  
First course in thermal sciences sequence. Properties of pure substances, gas laws, first and second laws of thermodynamics are studied and applied. The Thermal Fluid Science I, II and III course sequence is offered exclusively in distance learning or blended format. The course is required for electrical/mechanical majors and may be an elective for other majors. This course is not for MET majors. (1016-231 or equivalent) **Credit 3**

**0660-402 Thermal Fluid Science II**  
Continuation of Thermal Fluid Science sequence covering fluid statics, fluid kinematics and fluid dynamics. The course emphasis is on those elements of fluid mechanics with particular relevance to conduit flow, heat loss and future heat transfer applications. The Thermal Fluid Science I, II and III course sequence is offered exclusively as distance or blended learning. The course is required for electrical/mechanical students and may be an elective for other majors. This course is not for MET majors. (Thermal Fluid Science I or equivalent) **Credit 3**

**0660-403 Thermal Fluid Science III**  
Third course in the thermal fluid science sequence. Thermal Fluid Science III focuses on heat transfer mechanisms and heat exchanger performance and selection. The Thermal Fluid Science I, II and III course sequence is offered exclusively for distance learning or blended format. This course is not for MET majors. (Thermal Fluid Science II or equivalent) **Credit 3**

**0660-405 Laboratory Practicum for Electrical/Mechanical Engineering Technology**  
This course will provide a single on-campus laboratory experience for online learning electrical/mechanical engineering technology students. The course focuses on testing of engineering materials. Components of electrical and manufacturing labs are also included. Requires one week on campus. (0610-211, 416, 0617-220, 0609-337, 441) Cannot also receive credit for 0610-304 and 409) **Credit 2**

**0660-419 Experimental Methods in Problem Solving for Electrical/Mechanical Engineering Technology**  
This is a course in experimental and laboratory techniques and the preparation of laboratory reports. Experiments utilize, but are not limited to, principles of statics, strength of materials, dynamics, electronics and controls. Students will be given problem statements and will develop and perform experiments to solve, or gain insight into, possible solutions. Students work independently to prepare formal and informal reports and an oral presentation. (0610-303, 408, 405, 410, 432, 0535-403) Cannot also receive credit for 0610-407. **Class 2, Lab 2, Credit 3**

## Accounting and Business Systems

**0680-201 Financial Accounting**  
Emphasis is on analyzing and recording business transactions and understanding the results of these transactions. Preparation of basic financial statements required by any business are included. **Credit 4**

**0680-203 Managerial Accounting**  
The functions and uses of accounting information are presented. Emphasis is on the preparation and operation of dynamic budgets and the use of accounting data for control and profit planning. (0680-201) **Credit 4**

**0680-224 Personal Financial Management**  
Manage your personal finances more effectively: personal budgeting, protection of personal assets, consumer credit, investments and estate planning are presented. **Credit 4**

**0680-308 Intermediate Accounting**  
Designed to broaden the understanding of accounting practices and improve skills in gathering, analyzing, reporting and evaluating accounting theory and concepts as they relate to business problems. (0680-203) **Credit 4**

**0680-309 Intermediate Accounting II**  
A continuation of Intermediate Accounting (0680-308) with advanced study of accounting theory and concepts as they relate to business problems. **Credit 4**

**0680-311 Business Law I**  
Introductory course in business law, including basic legal principles and procedures, criminal law, torts, contracts, sales and real property. **Credit 4**

**0680-312 Business Law II**  
Continuation of 0680-311 includes law agency, partnerships, corporations, insurance and bankruptcy. Also presents survey of commercial paper, secured transactions and bank deposits. **Credit 4**

**0680-315 Legal Environment of Business**  
Foundation course that introduces the function of law in society, the fundamentals of the federal and state court systems, contract formation (offer, acceptance, consideration and capacity) and related ethical issues and the emergence of the federal regulatory agencies and practical impact of these agencies on the American business community. **Credit 4**

**0680-341 Information Resources/Network Tool**  
An overview of the evolution and structure of the computing environment and information networks. Topics include the evolution of the computer; personal computers, workstations and local area networks; tools for managing information; systems design and analysis tools; electronic mail; and using the Internet. Labs explore information resources and data communication tools available on the RIT computer network and the Internet. **Credit 4**

**0680-353 Management Science**  
Foundation course that introduces mathematical model building and the use of management science in the decision-making process. Mathematical techniques include linear programming, the assignment model, the transportation model, inventory control models, critical-path models (PERT/CPM) and computer simulation. Homework assignments include running "canned" computer application programs. **Credit 4**

## Business Administration Management

**0681-200 Management Process**  
A comprehensive three-quarter course in effective supervision and management for supervisors and potential supervisors. Approximately 50 topics of current importance to supervisors are presented as well as essential management principles, business communication and practical supervision techniques. Specific supervisory problems of course participants are discussed in informal sessions and through projects conducted outside the classroom. Instruction is usually guided by a team of management specialists. Lecture discussion, panel presentations, audiovisual presentation, simulation exercises and case studies. (Course sequence extends over three consecutive quarters and should be taken in sequence when possible.) A management certificate is awarded for successful completion of the three-course sequence. **Credit 4 (12 credits total)**

**0681-201 Management Process II**  
A comprehensive three-quarter course in effective supervision and management for supervisors and potential supervisors. Approximately 50 topics of current importance to supervisors are presented as well as essential management principles, business communication and practical supervision techniques. Specific supervisory problems of course participants are discussed in informal sessions and through projects conducted outside the classroom. Instruction is usually guided by a team of management specialists. Lecture discussion, panel presentations, audiovisual presentation, simulation exercises and case studies. (Course extends over three consecutive quarters and should be taken in sequence.) A management certificate is awarded for successful completion of the courses. **Credit 4 (12 credits total)**

**0681-202 Management Process III**  
A comprehensive three-quarter course in effective supervision and management for supervisors and potential supervisors. Approximately 50 topics of current importance to supervisors are presented as well as essential management principles, business communication and practical supervision techniques. Specific supervisory problems of course participants are discussed in informal sessions and through projects conducted outside the classroom. Instruction is usually guided by a team of management specialists. Lecture discussion, panel presentations, audiovisual presentation, simulation exercises and case studies. (Course extends over three consecutive quarters and should be taken in sequence.) A management certificate is awarded for successful completion of the course. **Credit 4 (12 credits total)**

- 0681-205** **Organization and Management**  
A general introduction to the major management functions and the organization of business. Topics include business and personal planning, organizing, staffing, implementing, directing, control, time management, appraisal, compensation, organization theories, decision making, problem solving, influences on managerial decision making, communication, management styles and motivation. Extensive use is made of learning groups in which students work together to discuss and apply concepts. Some out-of-class time is required to prepare for a learning group presentation. **Credit 4**
- 0681-221** **New Venture Development**  
Course presents factors to be considered by those interested in the ownership and management of small business enterprises. Includes who should be an entrepreneur, guidelines for starting a new business, basic legal consideration and approaches for obtaining capital and credit. **Credit 4**
- 0681-222** **Small Business Management**  
The functions required to successfully manage and finance a small business are presented. A variety of topics include staffing a small business, purchasing and supplier relations, consumer credit policies and the financial and administrative controls necessary to minimize business risk. **Credit 4**
- 0681-223** **Small Business Marketing and Planning**  
Presents various successful planning and marketing approaches (including market determination, distribution and pricing strategies). The regulatory environment facing small business is included along with techniques for planning growth. **Credit 4**
- 0681-241** **Production Management**  
The organization of production functions with emphasis on management responsibilities. All levels of factory operation are discussed and relationships between various aspects of production are presented. **Credit 4**
- 0681-261** **Effective Selling**  
Investigates the importance of the sales function within the overall marketing organization and the necessary general characteristics of a successful sales person. The various steps of the sales process and the practical applications of effective sales presentation are discussed. **Credit 4**
- 0681-263** **Advertising Principles**  
Social, economic and mass communication aspects of advertising with special emphasis on the role of advertising in the marketing mix. Special topics include agency/client relationship, radio and TV ratings, history of advertising, the creative process and psycho-graphics. Guest lecturers discuss corporate campaigns. **Credit 4**
- 0681-264** **Advertising Evaluation and Techniques**  
Course presents basic approaches used in planning, preparation and evaluation of advertising and sales promotional materials. A number of projects involving writing/layout/production for print, broadcast and specialized media advertising are incorporated. **Credit 4**
- 0681-341** **Fundamentals of Industrial Engineering**  
An overview of industrial engineering problems and techniques is presented, including facilities selection and layout, methods analysis, work measurements, operations planning and control, materials handling and an introduction to operations research. **Credit 4**
- 0681-342** **Industrial Engineering Economy**  
The economic factors required for rational decisions are presented. Emphasis is on analytical tools used in a manufacturing environment, including evaluation of capital spending alternatives, depreciation methods, decision making under risk conditions and value analysis methods. **Credit 4**
- 0681-345** **International Standards**  
As the marketplace becomes increasingly oriented toward the international exchange of goods and services, the International Organization for Standardization continues to develop a set of quality standards assuring that goods and services produced by a supplier are capable of meeting the requirements of customers around the globe. The emerging development of international standards in terminology and quality is addressed. Manufacturing standardization in such industries as telecommunications and electronics is considered. Elective for the international business and culture certificate. **Credit 2**
- 0681-361** **Marketing**  
An introductory course in marketing that provides a better awareness of the function of marketing and how marketing relates to other areas of business. Topics include the marketing concept, developing a product strategy, behavioral aspects of consumer marketing, the marketing mix, segmentation and current marketing issues. **Credit 4**
- 0681-398** **Special Topics**  
Special topics are experimental courses offered quarterly. Watch for titles in the course listing each quarter. **Credit variable**
- 0681-409** **Core Concepts of Project Management**  
This course addresses project management from a technological or skill-based aspect rather than a focus on theoretical or historical aspects of project management. Includes substantial demonstration and use of project management application software, spreadsheets and businesses diagramming packages. Course is organized around the project life cycle and draws techniques from the Project Management Body of Knowledge (PMBOK). Includes topics such as project definition, staffing, planning, budgeting, scheduling, resource allocating and terminating. Particular emphasis on the human side of project management: negotiation and conflict resolution. Course not intended for those students planning to take advanced course work in project management and may not be substituted for 0681-410 Introduction to Project Management. **Credit 4**
- 0681-410** **Introduction to Project Management**  
Addresses project management from a multidisciplinary perspective, covering the fundamental nature of managing all types of projects—public, business, engineering and information systems—as well as specific techniques required to manage projects. Topics include project environment, planning, conflict and negotiation, budgeting, scheduling, resource allocation, monitoring and controlling and project termination. Addresses the unique and demanding role of the project manager, the challenges of cross-cultural projects and the behavior and quantitative facets of project management. Introduces the major areas of the Project Management Body of Knowledge (PMBOK) as defined by the Project Management Institute. (Introductory course[s] in management, 0692-211 and 0680-341 or equivalent experience.) **Credit 4**
- 0681-411** **Advanced Project Management**  
Course covers the advanced project management topics necessary for implementation of and excellence in project management. It deals with turning the principles and theory of project management into practice. Addresses the best practices for project management in the world; project portfolio management; the project office; project risk management; multinational cultures and cultural failures; integrated project teams; and virtual project teams. Incorporates aspects of the Project Management Body of Knowledge (PMBOK). (Introduction to Project Management 0681-410 or equivalent experience or permission of the instructor) **Credit 4**
- 0681-412** **International Project Management**  
With the increasing frequency of globalization, mergers and acquisitions, international projects are becoming more prevalent and approaching the norm for many organizations. This course addresses a wide range of international projects based in different industries and multiple countries. It deals with cultural and social differences within firms; cultural and social differences among countries and within countries; languages and dialect variations; different management practices and structures; religious practices; legal, regulatory and reporting requirements; technology differences in different areas; and time zone differences. Incorporates aspects of the Project Management Body of Knowledge (PMBOK). (Introduction to Project Management 0681-410 and Advanced Project Management 0681-411 or equivalent experience or permission of the instructor) **Credit 4**
- 0681-451** **Introduction to Logistics and Transportation**  
Review of the logistics and transportation industry as part of the growing emphasis on distribution technologies. Introduces basic understandings of the function areas of logistics management and their interrelationships and how transportation and distribution play a significant role in the success of a business. **Class 4, Credit 4**
- 0681-525** **Strategic Logistics Management**  
Introduces the role of the government in the transportation industry. The evolution of past and current regulatory and promotional policies is explored. The determination and utilization of freight rates are examined. Various methods to forecast and control transportation costs also are discussed. **Credit 4**

**0681-526** **Logistic Law and Economics**  
Introduces the basic skills required to move materials in support of the logistics function internationally. Includes discussions of duties, customs regulations and the various instruments used to facilitate international trade. **Class 4, Credit 4**

## Quality Management

**0684-225** **Recruiting, Training, Supervising Person**  
Problems and solutions related to establishing realistic and attractive wages and career paths for employees in service sector businesses are examined. Also explored are the motivation, training and communication techniques that lead to the performance quality required in service industries and organizations to optimize customer satisfaction. **Class 2, Credit 2**

**0684-227** **New Service Economy**  
Provides an overview of the emerging national and regional service economies. Defines the service sector, both consumer and producer of services, using a variety of local examples drawn from health care, information and communication, hospitality, financial and personnel services. Economic and labor force implications of the service economy are analyzed along with the structure of service organizations, service delivery systems and levels of service. **Class 2, Credit 2**

**0684-310** **Introduction to Quality**  
An introduction to the fundamental concepts of total quality management. Includes an overview of the competitive environment, the cost of non-quality and the history of quality; a systematic examination of the leading definitions of quality and models of quality management; and an exploration of the implication of quality management concepts for organizational structure and roles, decision making and interpersonal relations. **Class 4, Credit 4**

**0684-340** **Quality Data Analysis**  
An introductory course in statistics and probability that emphasizes the analysis and interpretation of variation in quality control. Topics include descriptive statistics (statistical tables and graphs, measures of central tendency and dispersion), a brief overview of probability theory, probability distributions, sampling distributions, confidence interval estimates and one and two sample hypotheses tests of means and proportions. The statistical package MINITAB is used extensively by the instructor to illustrate statistical procedures and by students to complete assignments. (Certificate in basic quality or approval of department) **Class 4, Credit 4**

**0684-350** **Customer Service Technology**  
An overview and analysis of technological systems for handling goods and information quickly and cost effectively to maximize customer satisfaction. **Class 4, Credit 4**

**0684-362** **Marketing Practices for Service Economy**  
Focuses on applications of traditional marketing concepts and techniques to the service sector (e.g., banking, health care, transportation and services within organizations) to optimize quality, customer satisfaction and sales/revenues/profits. Includes a brief review of the increased role of service in the economy. **Class 2, Credit 2**

**0684-370** **Reliability I**  
Reliability I introduces the students to the concepts embodied in maintenance strategies, mainly reactive maintenance, preventive maintenance, predictive maintenance and proactive maintenance and in reliability-based maintenance. These strategies will be defined and their goals set forth. Reliability concepts and tools will be introduced that will form the foundation of a reliability-based maintenance program. **Class 4, Credit 4**

**0684-375** **Problem Investigation, Isolation and Analysis**  
An introduction to problem solving methodologies and tools used in reliability-based maintenance. Topics include: root cause analysis, fault tree analysis, FMEA, FRACAS, mechanical system failure processes, diagnostic systems/devices, RCM and multi-vari analysis. (0692-211 or permission of department chair and 0684-370) **Class 4, Credit 4**

**0684-376** **Reliability II**  
This course examines the underlying probability distributions and statistical tests that are used in reliability-based, -centered maintenance. Included are: the exponential distribution, curve fitting techniques, the normal distribution, the lognormal distribution, extreme value statistics, the Weibull distribution and reliability analysis of repairable systems. Graphical techniques will be emphasized along with data analysis using the statistical package MINITAB and reliability software programs provided by the instructor. (0609-221 or equivalent and 0684-370, 375) **Class 4, Credit 4**

**0684-377** **Reliability III**  
Continuation of Reliability II focusing on theoretical and practical applications of reliability, availability and maintainability. Topics include parts selection and control, reliability analysis, reliability test and evaluation, equipment production and usage, spare parts forecasting, reliability/maintainability trade-offs and improvement techniques. (0692-212 or equivalent; 0684-370, 0684-375, 0684-376) **Class 4, Credit 4**

**0684-378** **Reliability IV**  
Continuation of theoretical and practical applications in Reliability III focusing on reliability test and evaluation, equipment production and usage, spare parts forecasting, reliability-maintainability trade offs and improvements. Reliability software is used extensively to illustrate analytical procedures and for assignments and term paper. **Class 4, Credit 4**

**0684-410** **Introduction to Lean Six Sigma**  
An introductory course in the decision-making process used for determining and evaluating the cost of quality in support of manufacturing, government, or service industries. Topics include a review of basic accounting and an analysis of items that are directly and indirectly affected by conformance or nonconformance to customer requirements. (Certificate in basic quality or approval of department) **Class 4, Credit 4**

**0684-420** **Statistical Quality Tools**  
An introductory course in Statistical Quality Control techniques used in determining operating quality levels and recognizing degrees of process control and capability in a service industry or a manufacturing process. Topics include acceptance sampling; tools for diagnosing sources of variation; construction and interpretation of charts for variables, attributes, CUSUM, multivariate charts and other approaches; process capability; and ANOVA. Students will also be given a short overview of design of experiments (DOE) concepts and Taguchi methods. Offered online only. (Permission of the instructor) **Credit 4**

**0684-430** **Management for Quality**  
Theory and techniques for introducing and institutionalizing quality management concepts and practices in all areas of organizational activity. Includes fundamental principles of organizational development, model programs for improving quality throughout the organization and techniques for analyzing organizational culture and identifying and remediating barriers to quality management. Introduces benchmarking and identifying and translating customer requirements as the foundations of the implementation process. (Certificate in basic quality) **Credit 4**

**0684-480** **Introduction to Asset Management**  
Unscheduled downtime costs businesses millions of dollars each year, but asset management and maintenance is often the last area to attract the attention of managers trying to lower costs. Usually thought of as non-value-added, maintenance and asset management policies can have a significant impact on a company's profit. This course introduces the student to the wide range of policies and practices, including capital budget issues related to asset acquisition, cost of ownership and depreciation; inventory/procurement; maintenance policies such as run-to-failure, preventive maintenance and reliability centered maintenance; training issues; and developing performance indicators for management programs. Co-listed with 0684-780. Note: Students may not receive credit for both 0684-480 and 0684-780. This is an online course. **Credit 4**



## Humanities and Social Sciences

**0686-298** **Special Topics: Humanities**  
Experimental lower-division courses are offered under this number; titles appear in each quarter's course listing. **Credit variable**

**0686-331** **Psychology: Behavior in Industry**  
Industry presents one environment for understanding human behavior. This course applies psychological and social concepts to the industrial setting. Topics covered are motivation, performance, assessment of quality of work life, group behavior, leadership, organizational structure, communication and decision making. (0514-210 recommended) **Credit 4**

**0686-332** **Psychology of Stress and Adjustment**  
Physiological, psychological and social stress can have serious consequences in one's daily life. This course familiarizes students with basic concepts, the positive and negative ramifications of stress and strategies for stress management. (0514-210 or equivalent) **Class 4, Credit 4**

**0686-333** **Psychology of Persuasion**  
This course examines important research on persuasive communication, covering: What causes people to respond to persuasive communication in different ways? How can the communicator predict group responses to a given persuasive message? Projects require students to use theory in designing effective strategies for various purposes and audiences. Required for the public relations communications certificate. **Class 2, Credit 2**

**0686-341** **Values and Experience**  
A study of the interaction between values and experience. Focuses on the impact of social institutions (religion, family, education, government) and technological developments on values and beliefs (including the definition of reality). This is a science, technology and humanities elective. **Class 4, Credit 4**

**0686-342** **Contemporary Moral Problems**  
A one-quarter course that presents moral issues that arise in the professions and other vocations of technical expertise. These problems in applied ethics are studied through contemporary literature by moral philosophers (e.g., Habermas, Singer) as well as key classical texts (e.g., Plato, Locke, Hume, etc.) **Class 4, Credit 4**

**0686-351** **African-American Film**  
Five thematic periods of African American filmmaking are explored through the lenses of history, theme type and sociological content. Special emphasis is given to the evolution of roles played by African American actors and to the achievements of African American directors. **Credit 4**

## Technical Communication

**0688-214** **Dynamic Communication**  
Dynamic Communication focuses on developing and improving writing skills. The achievement of clarity, coherence, logical development of ideas and effective use of language are emphasized. Basic research techniques are included. (Requires pretest) **Credit 4**

**0688-220** **Communications**  
Focuses on refining writing skills, emphasizing organization, support and effective expression of ideas in multiparagraph papers. The major exercise is preparation of a position paper and an oral defense of the paper's thesis. Research methods and principles of effective argumentation are studied. (Requires pretest or completion of 0688-214) Note: Students who apply for Dynamic Communication, 0688-214, or Communications 0688-220, must take a pretest to determine the course most appropriate for their communication needs. Only students who have credit for 0688-214 or equivalent may register for this course. **Credit 4**

**0688-225** **Interpersonal Communication Skills**  
Knowing when to speak, what to say and how to say it is a prime asset for achieving success in many areas of our lives. This course focuses on techniques for communicating successfully in career, social and personal interactions. Topics include assessing communication situations, clarifying ideas, listening, persuading and managing conflicting viewpoints. **Credit 2**

**0688-260** **Art for Reproduction**  
This course prepares students to enter the field of graphic design by providing orientation and the studio experience in the presentation of imagery for reproduction. Presentations include board techniques, materials, tools, mechanical art procedures, printing and bindery processes, etc. **Class 3, Credit 3**

**0688-261** **Graphic Communication for Non-Artist**  
This course introduces basic skills in communication graphics, including elements of design (line, shape, texture, color, space) and their application to two-dimensional projects, typography and commercial layout procedures (from rough layouts to comprehensives), rendering techniques, marker sketching, shadowing and perspective). Designed for people with little or no previous art training. Lecture/demonstration and studio format; student projects followed by critiques. **Class 3, Credit 3**

**0688-262** **Graphic Communication Non-Artist II**  
This course gives an exploration of current approaches to solving graphic design problems in the communications professions, applying basic skills in design, lettering, layout and rendering, with emphasis on the use and selection of art materials, photographs and photographic/electronic image producing equipment; and an exploration of design in the advertising process, involving planning, creating, producing and evaluating media. (0688-261 or equivalent) **Class 3, Credit 3**

**0688-271** **Basic Computer Graphics**  
Experimenting with basic principles and elements of design, students approach the computer as a tool for image making. The software application CorelDraw is used to design and develop all assignments and projects. No prior design training or computer background is necessary. **Class 2, Credit 2**

**0688-272** **Special Topics: Design**  
Special topics are experimental courses announced quarterly. Watch for titles in the course listing each quarter. **Credit variable**

**0688-320** **Professional Presentation**  
Focuses on the principles of preparing and delivering oral presentations. Students deliver a variety of speech types representative of those commonly occurring in business, industrial, community and social settings. Self, peer and instructor critiquing are used for evaluation of in-class and videotaped speeches. **Credit 4**

**0688-321** **Discussion Skills and Leadership**  
Students study the theory of leadership in small groups and the dynamics of group behavior. The major exercises of the course are leading and participating as members in conferences that stimulate those of civic, business and industrial settings. Peer critiquing and videotaping allow students to apply theory as they learn to recognize the elements of successful conferences. **Class 4, Credit 4**

**0688-322** **Interpersonal Communication for Customer Service**  
Interpersonal Communication for Customer Service is a 10-week course for cable telecommunications personnel and part of the cable college foundations certificate. The course helps participants define interpersonal communication for customer service and show professionalism in customer service. Participants will learn how to listen effectively, apply assertiveness appropriately and apply telephone skills, conflict resolution skills and problem-solving methods. Participants will learn how to educate the customer on new or changed products and services and contribute to building customer satisfaction and loyalty through quality customer service. **Credit 4**

**0688-325** **Communicating in Business**  
Focuses on the development of those communication skills essential to functioning effectively in the business world. Students learn the process of analyzing communication situations and responding to them appropriately. Topics include reports, memos, letters, oral presentations and interpersonal skills. (0688-220 or equivalent) **Class 4, Credit 4**

**0688-327** **Environmental Communication**  
Communication of environmental information and issues is critical for awareness, information and action. Students develop skill in reporting and conveying environmental and scientific information as well as an understanding of the role of the media and public relations in the environmental communication process. Writing and speaking skills are sharpened for successful business and media communication. (0502-227 or equivalent) **Class 4, Credit 4**

**0688-330** **Technical Report Writing**  
Students learn to prepare reports of the sort required by practicing engineers and managers in industry and business. Focus is on developing the ability to analyze audiences and purposes, state problems, design reports and write and edit them. Assigned reports are discussed and critiqued by peers and instructor. (0688-220 or equivalent) **Credit 4**

**0688-331** **Report Writing**  
Principles of organizing information into clear, concise reports. Techniques for oral reports, formal reports and informal letter and memo reports. Also includes proposals, project status and progress reports. **Credit 2**

**0688-333** **Technical Writing and Editing**  
Focuses on the writing skills required for preparing technical documents. Adapting material and language for audience and purpose and conventions of technical writing style are emphasized. Strategies for evaluating technical discourse are studied and applied. Prior to enrolling in this course, students must demonstrate command of standard written English prose. (For students in basic technical communication program. Others contact program chair) **Credit 4**

**0688-347** **Promotional Writing**  
Focuses on practical guidelines for preparing marketing materials, including brochures, data sheets, trade press articles, press kits and advertising copy. (0502-227 or equivalent) **Credit 2**

**0688-348** **Managing the Project**  
Principles of project management are studied and applied in cases and examples taken from the fields of technical and public relations communications. Major topics include planning, organizing, scheduling, budgeting, controlling, monitoring and reporting. Conflict resolution, team building and motivation are also covered. Use of project management software is introduced. **Credit 2**

**0688-350** **Introduction to Public Relations**  
An overview of the public relations function, covering tasks, responsibilities and roles of the PR practitioner as researcher, image developer, designer, editor, coordinator, marketer and advertiser; as adviser to management; and as spokesperson, media manager and services purchaser and provider. **Credit 2**

**0688-352** **Writing for the Organization**  
Introduction to public relations writing at the corporate level, including planning, writing and producing documents and publications intended to interpret the organization both internally and externally. Provides practice in writing a variety of news and feature copy, including crisis communication, covering meetings, adapting interviews for print and statements for various media. **Credit 2**

**0688-353** **Scripting and Audio Video Presentations**  
Introduces writing and production techniques for audiovisual and video presentations. Scripting prepares students to write a specialized form of communication-dialogue that is to be spoken and heard. Instruction on enhancing the verbal message with visuals is presented. Dimensions of wording, voice characterization, sound, motion and color are explored. Includes storyboarding and an introduction to traditional and emerging production methods. **Class 2, Credit 2**

**0688-354** **Speechwriting**  
Introduces principles of speechwriting, a highly specialized form of professional communications. Speechwriting covers techniques for preparing a speech in the "voice" of another. Writing for the "ear" and adapting the message, wording, body language and tone to the speaker are included. Techniques for enhancing message retention are studied. (0688-220 or equivalent) **Credit 2**

**0688-355** **Coordinating Public Productions**  
A survey course for professional communicators. Provides an overview of major phases of print production and general understanding of the factors that must be considered in purchasing print production services: estimates, schedules, paper and binding options, colorization, print trade customs and illustrations; and guidelines for coordinating the stages of production. **Credit 2**

**0688-356** **Strategic Communications**  
This is a survey of strategic reactions to organizational communication problems. Case studies are used to analyze how communications research, planning, implementation and evaluation are used to contribute to organizational goals and respond to needs and crises. Students study real cases where organizations have developed strategies for communication with consumers, employees, investors, government bodies, communities and other publics. **Credit 2**

**0688-357** **Media Relations**  
Designed for writers whose positions frequently require preparation of public relations correspondence as well as copy for inbound and outbound company publications. Emphasis is on developing clarity, precise use of language and style in writing media letters and news release, reporting information and creating feature articles. **Credit 2**

**0688-361** **Research Techniques**  
This course offers exposure to and experience with electronic and traditional resources for information generation. Student assignments simulate workplace fact-finding assignments and culminate in an extended feasibility project of the student's choice. Students work in teams and use problem-solving strategies, assess project requirements, collect data, report periodically on their progress and formally present their results. A variety of research methodologies are introduced, including interviewing skills, developing and using questionnaires, testing procedures, review and use of literature and blueprint and specification reading. **Credit 4**

**0688-362** **Instructional Design Principles**  
This course presents an overview of the process of designing instructional packages from need and task analysis through identifying goals and objectives, media selection, program development and validation testing. **Class 4, Credit 4**

**0688-363** **Technical Document Design**  
This course presents an overview of the principles and contemporary techniques involved in document design and provides the student with an opportunity to exercise them in the preparation of a technical manual. Topics include the basic principles of graphic design and visual communication, use of computer graphics and page layout programs, typography and its role in document design and reproduction and distribution methods. Students will plan, research, design, write, format, edit and produce a finished technical manual. **Class 4, Credit 4**

**0688-371** **Designing with Computers I**  
An introduction to the computer as a design tool. This course, the first of a two-course sequence, was created for people just beginning to apply their design skills to a computer. In a hands-on lab the software application Freehand (vector-based program) for illustrative techniques is introduced. A variety of related topics, such as design concepts, other software, computer needs and misconceptions, will be discussed. Previous design experience is recommended. (0688-271 or equivalent) **Class 3, Credit 3**

**0688-372** **Designing with Computers II**  
In a hands-on lab setting, page and document layout techniques are introduced using the graphic design software application InDesign. A variety of related topics, such as design concepts, other software, computer needs and misconceptions, will be discussed. (0688-271 or equivalent) **Credit 3**

**0688-373** **Electronic Presentation Design**  
This course introduces basic techniques for the creation of electronic presentations using computer software. Students learn to design individual slides and transparencies and dynamic and effective assembled presentations. The software application Power Point is used. **Class 3, Credit 3**

**0688-374** **Designing with Corel Draw**  
The second course of a two-course sequence, this provides a foundation in raster and vector-based computer graphics. Students design text and graphics for press and Internet using the Corel Draw suite. Skills and information gained will carry into other software applications. (0688-271 or permission from instructor) **Credit 3**

**0688-381** **Photo Imaging with Computers I**  
An introduction to the computer as a photographic tool for people just beginning to apply their photography or photo-design skills to a computer. Adobe Photoshop is presented in a hands-on, two-quarter lab sequence. In the first-quarter lab, students explore traditional photographic techniques using a computer with an electronic camera; second quarter, photographic manipulation using a computer with a flatbed scanner. **Credit 3**

**0688-382** **Photo Imaging with Computers II**  
Adobe Photoshop is presented in a hands-on, two-quarter lab sequence. In the second-quarter lab, students explore photographic manipulation using a computer with a flatbed scanner. **Credit 3**

**0688-383** **Introduction to Internet Design**  
This course introduces basic techniques for the creation and design of electronic sites and pages for the Internet and the World Wide Web. Students learn the graphic techniques and tools to construct a well-designed and effective homepage and site. **Credit 3**

**0688-384** **Designing with QuarkXPress**  
In-class lecture, instructor demonstration and guided practice are used to familiarize students with the techniques of using QuarkXPress, a sophisticated desktop publishing program. Students are instructed in basic document design principles, including layout and typography and using Quark to implement them. **Credit 3**

**0688-410** **Advanced Internet Design**  
This course concentrates on building Web design skills beyond basic HTML while exploring current topics in Web development. Students focus on learning Flash interaction and animation through exercises and projects to produce Web sites that apply effective information architecture and usability concepts. Students are introduced to the Flash Action Script programming language. Emphasis is on learning how to keep abreast of current Internet technologies through an overview of related technologies such as JavaScript, XML, PHP and Cold Fusion. **Credit 4**

**0688-412** **Advanced Photoshop Techniques**  
This course will offer a strategic view of the Photoshop/digital imaging work environment. It will focus on broader techniques with an emphasis on preparing high-quality images for print publication. Topics such as masking, color models, image correction and file formats will be discussed in detail. This course has a graduate section that is co-listed with 0688-712. Students taking 0688-412 may not receive credit for 0688-712. (0688-382) **Credit 3**

**0688-465** **On Camera! On Mike!**  
Focuses on preparation and delivery skills for effective radio and TV appearances by non-professionals serving as spokespersons for their organizations. Audio and video tapings of simulated interviews, press conferences and panel presentations provide opportunities for student practice and for instructor and peer critiques. Also presents a framework for understanding the perspectives and functions of the broadcast media as well as guidelines for effective use of broadcast formats to achieve public relations or marketing goals. **Credit 4**

**0688-475** **Writing Software User Documentation**  
Defines and provides examples of end-user documentation for software products; defines the conventional audience, content, structure and language of software user manuals; identifies typical problems in user manuals; explores types of online user information; and defines usability testing. Practice in writing step-by-step procedures, defining system and software concepts and describing functional processes. **Credit 2**

**0688-476** **Instructional Design Principles**  
This course presents an overview of the process of designing instructional packages from need and task analysis through identifying goals and objectives, media selection, program development and validation testing. **Class 4, Credit 4**

**0688-477** **Managing Media Presentations**  
An introduction to design principles and software applications for creating and organizing media presentations on technical topics. Includes principles of Web page design, the development of computer-based illustrations and electronic presentations. Covers the use of Power Point and other software applications. Project management skills are introduced. **Credit 4**

**0688-500** **Communications Elective**  
This course covers special communication topics and subject areas and is offered on demand. **Credit variable**

**0688-510** **Technical Information Design**  
Intensive practice in the creation of content for online and multimedia documents with emphasis on the presentation of technical and scientific concepts, products and processes. A survey of graphic methods for the display of complex technical relationships and processes. Students will also be introduced to contemporary topics and applications in technical information design. **Credit 4**

**0688-511** **Documentation Usability**  
This class presents concepts, tools and techniques used to increase the usability of printed and online documentations, including multimedia interfaces, through usability evaluation and usability testing. It discusses ways to incorporate usability testing into the design process, saving time and money by eliminating design and functionality problems early in the design process. (0688-333 or equivalent) **Credit 4**

**0688-512** **Writing Procedures and Online Help**  
The development of task-oriented procedural documentation. Covers procedures for complex physical and mental tasks, including time-constrained activities, emergencies, diagnostics and troubleshooting and multiple-path processes, and formats for print, electronic and multimedia instructions. Provides an introduction to applications used for the creation of online help, including we-delivered and HTML help. The course will also cover the principles of designing and writing online help, regardless of the help authoring tool used to create it. Practice will be given in writing procedures of various formats, as well as writing online delivery, particularly via online help. **Credit 4**

**0688-514** **Technical Proposals**  
The elements of proposal writing, including responsiveness, establishing credibility and technical clarity. Covers the proposal process as practiced in government and industry, including an understanding of RFPs, RFIs and the decision process, as well as specialized proposals, including NDAs, online and multimedia proposals and technical marketing presentations. **Credit 4**

**0688-520** **International Communication**  
This course provides students with an overview of the techniques and problems encountered in communication that crosses cultural and national boundaries. During this course students will examine strategies and methodologies for effective global communication and determine the best ways to convey their messages despite barriers imposed by differences in language, culture and time zone as well as global distance and administrative considerations. A variety of cases in marketing, government, entertainment and publishing will be studied to provide a working context for the theoretical considerations. **Credit 2**

**0688-544** **Writing for the Sciences**  
Course introduces students to the writing requirements for describing scientific and technological subject matter for presentation to general audiences. Students will learn to write and edit material for professional, in-house, trade and popular publications that cover developments in the scientific and technical areas. The editing of scientific writing is also introduced. **Credit 4**

## Math and Science

**0692-201** **Math Thought and Processes**  
An examination of mathematical thought and processes through a study of elementary mathematical concepts. This course will acquaint the student with the "mathematical way of thinking." Topics include sets, numeration systems, number theory, real numbers and finite systems. **Credit 4**

**0692-202** **Modern Math Methods**  
A continuation of 0692-201 with an examination of selected modern mathematical methods used in today's society. This examination includes a study of equations, inequalities, problem solving, graphs and functions, probability, statistics and the usefulness of these methods today. **Credit 4**

**0692-211** **College Math for Business**  
An introduction to mathematical concepts and quantitative methods required in business management. Included are sets and real number system; linear, nonlinear and exponential functions; and system of equations and inequalities. Differential and integrated calculus is introduced, as well as some special topics in quantitative analysis such as linear programming and simulation. **Credit 4**

**0692-212** **College Math for Business II**  
An introduction to mathematical concepts and quantitative methods required in business management. Included are sets and real number; linear, nonlinear and exponential functions; and system of equations and inequalities. Differential and integrated calculus is introduced as well as some special topics in quantitative analysis such as linear programming and simulation. (0692-211 or department approval) **Credit 4**

**0692-221** **Technical Math**  
A two-quarter sequence introducing college algebra and trigonometry and covering basic algebraic concepts and operations, algebraic and transcendental (trigonometric, logarithmic and exponential) functions. (Three years high school math or equivalent; requires pretest) **Credit 4**

**0692-222** **Technical Math II**  
A two-quarter sequence introducing college algebra and trigonometry and covering basic algebraic concepts and operations, algebraic and transcendental (trigonometric, logarithmic and exponential) functions. (Three years high school math or equivalent; requires pretest) **Credit 4**

**0692-223** **Technical Calculus**  
An elementary applied calculus course covering the basic differential and integral calculus of algebraic and transcendental functions with applications. (0692-222 or equivalent) **Credit 4**

**0692-231** **Contemporary Science-Biology**  
An introduction to the fundamental principles of biology for non-science majors and the application of these concepts to areas of interest in our contemporary technological society. Topics discussed include the cell as a biological unit, the biogenesis-abiogenesis controversy, genetic coding and introduction to plant and animal biology. The course is presented in a lecture-demonstration format. (0692-221 or 0692-201 or 0692-211 or equivalent) **Credit 4**

**0692-232** **Contemporary Science-Chemistry**  
An introduction to the fundamental principles of chemistry for non-science majors and the application of those concepts to areas of interest and concern in our contemporary technological society. Topics discussed include the atomic theory, chemical compounds, chemical reactions, organic chemistry, biological chemistry and macromolecular chemistry. The course is presented in lecture-demonstration format. (0692-221 or 0692-201 or 0692-211 or equivalent) **Credit 4**

**0692-233** **Contemporary Science-Physics**  
An introduction to the fundamental principles of physics for non-science majors and the application of these concepts to areas of interest and concern in our contemporary technological society. The conceptual basis for the phenomena of heat, light, sound, mechanics, electricity and magnetism is discussed and related to such topics as astronomy, space exploration, lasers and environmental concerns. The course is presented in a lecture-demonstration format. (0692-221 or 0692-201 or 0692-211 or equivalent) **Credit 4**

**0692-234** **Oceanus**  
An introduction to the fundamental principles of oceanography for non-science majors and the application of those concepts to areas of interest and concern in our contemporary technological society. The marine environment is investigated in terms of basic scientific concepts; topics discussed include plate tectonics and earthquake prediction, the impact of ocean pollutants, climate fluctuations, cetacean intelligence and resources from the sea. (Distance learning offering) (High school algebra) **Credit 4**

**0692-236** **Contemporary Science-Astronomy**  
An introduction to the fundamentals of astronomy for non-science majors. After learning to locate and identify visible objects in the night sky, students are introduced to the scientific instruments and techniques used to investigate celestial phenomena. Subsequent discussions show how observational data reveal the physical nature and evolution of planets, stars and galaxies. Requires proficiency in algebra and a familiarity with simple trigonometric relationships. This is a distance learning offering. **Credit 4**

**0692-250** **Introduction to Computer Program**  
Basic concepts and overview of computer science. The topics include historical development, algorithms, flowcharting and programming in BASIC. Exposure to hardware concepts, software concepts, binary and hex numbers and logic. Application of the computer to various disciplines. Not for computer science majors. This is a distance learning offering. (High school intermediate algebra) **Credit 4**

**0692-311** **Statistics**  
An introduction to the basic tools of statistical analysis used in business, including charts, frequency distribution, averages, dispersion, probability theory, sampling. Logical procedures for making business decisions under conditions of uncertainty are emphasized. Hypothesis testing, including one, two and k-sample test means; proportions, regression and correlation analysis are also included. (0692-212) **Credit 4**

**0692-312** **Statistics II**  
An introduction to the basic tools of statistical analysis used in business, including charts, frequency distribution, averages, dispersion, probability theory, sampling. Logical procedures for making business decisions under conditions of uncertainty are emphasized. Hypothesis testing including one, two and k-sample test means; proportions, regression and correlation analysis are also included. (0692-212) **Credit 4**

**0692-599** **Independent Study**  
This course number should be used by students who plan to study a math topic on an independent basis. The student must obtain permission of the appropriate faculty member before registering for the course.

**0693-401** **Introduction to Geographical Information Systems**  
This course will introduce students to the world of geographic information systems (GIS). Course readings, lectures and labs cover a mix of practical and technical GIS topics: fundamental GIS concepts, ArcGIS software competency, spatial data, spatial data analysis fundamentals and cartography. This course is co-listed with 0693-701. Students who have taken 0693-401 may not subsequently register for 0693-701 for graduate level credit. **Credit 4**

## Multidisciplinary Studies

**0697-201** **Student Seminar**  
This is a required, developmental course in the University Program in which students focus on the essential college and life success skills. Utilizing individual active learning activities, group work, role plays and class discussion, students explore topics such as personal responsibility, success, career goals, learning and personal style, academic performance and expectations and time and stress management. Specific college success skills such as test taking, textbook reading, using the library and information/communication systems, note taking and study systems, are reviewed. **Credit 2**

**0697-220** **Career Plan and Decision**

**0697-240** **Methods of Learning**  
Provides students with analytical thinking skills and strategies that are effective across academic disciplines. The process of "learning to learn" considers an individual's natural learning skills and how to apply them to academic work. The importance of questioning in the active learning process is established through guided instruction. The application of skills to current academic course work is reinforced through small group sessions and carefully monitored independent student self-assessment. **Credit 4**

**0697-300** **The Leader in You**  
This course introduces students to the concept of personal leadership. Students will identify and evaluate frameworks for successful leadership and learn critical skills and strategies that will enable them to achieve success in their personal and professional lives no matter what their discipline. Focus areas include: personal goal setting through the creation of mission and vision statements, self analysis of values and decision making, emotional intelligence and interpersonal communication techniques. Course work will include readings enhanced by experiential activities, cases studies, written reports and reflections. This course is suitable for all students desiring to develop and learn about their leadership potential or by permission of instructor. **Credit 2**

**0697-301** **Leading Others**  
In this course, students will learn the most effective strategies and skills for leading others and projects. Through a variety of experiential exercises, field work and an in-depth look at a variety of leadership styles and theories, students will evaluate their strengths and weaknesses as a leader and develop a plan of action to improve skills. Areas of focus include leadership theories and styles, teamwork and group dynamics, cultural communication and influence, and ethical decision making. This course is suitable for students with previous leadership experience or by permission of instructor and can be used to meet one of the free elective requirements in the new curriculum. **Credit 2**

**0697-430** **Survey of Organizational Change**  
This course will facilitate a student's understanding of factors that impact and influence behavior in contemporary organizations. In addition, students will develop skills that can be used to function effectively in the workplace. The course focuses on individual behavior, teams, motivation, decision-making and creativity. Leadership, power and politics in organizations are also addressed. Other topics include culture and change, including the need for continuous learning and attention to the learning organization, ethics and values, organizational structure and conflict. The importance of effective communication is stressed throughout the course. **Credit 4**

**0697-431** **Understanding Corporate Culture**  
An introduction to the concepts of organizational/corporate culture and the methods of analyzing it. Focuses on the development of skills required to assess corporate culture in terms of ritual, symbol, structure, language and identity. Also included are a history of the study of corporate culture, an analysis of leadership styles and communication patterns in the workplace, an overview of strategies for managing corporate and organizational change and an orientation to leadership styles appropriate to the successful manipulation of cultural elements. Emphasis is on both individual and interactive learning processes. (0510-210 and either 0514-210 or 0515-210) **Credit 4**

**0697-432** **Managing Organizational Change**  
At a time when America is learning that change—and not stability—is at the heart of business and organizational vitality, this course offers students insight into theories of organizational dynamics and change as well as an introduction to skills for managing change and negotiating. The strategies covered include, but are not limited to, community building, managing corporate and individual change and identifying resistance conflict. **Credit 4**

**0697-433** **Teams and Team Development**  
Meets the increasing need to understand and participate in teams in the workplace. Students establish a strong framework of group theory through topics that include current group and team theory research, individual functions in a team and team leadership, mission and global development, evaluating team effectiveness, negotiating persuasion and conflict resolution. This course is highly interactive, with projects that require the student to use the theory in constructing and observing cross-functional work teams, self-directed teams and integrated work teams. Learning takes place through lectures, case studies, simulations and group projects that develop strong team skills and reinforce team theory. **Credit 4**

**0697-434** **Change and Leadership Project**  
This course integrates the knowledge gained in the courses that make up the organizational change and leadership certificate and, therefore, cannot be taken until all the courses in the certificate have been completed. Students will be expected to identify an area within their studies of change and leadership that is of most interest to them. Once they have identified their area of interest, they will discuss this with the faculty member assigned to the course and begin the process of developing a proposal of the work to be accomplished. Well-planned and fully thought-out proposals lead to the best projects and the ones that are most easily executed and completed. Upon acceptance of the proposal, students will complete the project and write a paper reflecting their area of choice, integrating the knowledge gained from the courses in the certificate. **Credit 4**

**0697-435** **Global Forces and Trends**  
Dealing with unpredictable futures is an on-going challenge for every leader, manager and individual. Whether you are making personal or organizational decisions, your success depends on your ability to envision the future with a proactive, strategic approach. The ability to analyze, adjust to and take advantage of emerging opportunities, trends and forces and to integrate and connect information patterns determines the success or failure of your decisions. In this course, methodologies and approaches such as scenario-based strategy, visual thinking, mind mapping, mental models, strategic thinking theory and challenging prevailing ideas are introduced and used to examine the technical, social, economic and demographic trends and forces affecting people, organizations and the choices they need to make. **Credit 4**

**0697-441** **Creative Critical Thinking and Problem Solving**  
An interdisciplinary approach to the generation and evaluation of ideas and solutions. Includes analysis of the conditions limiting creativity and the development of a “toolkit” of strategies and techniques for discovering, inventing and assessing new, unique and useful ideas, applications and solutions. Applicable to a range of life and work situations, from complex environmental concerns to competitive business challenges to family disputes. **Credit 4**

**0697-442** **Learning Organization**  
This interdisciplinary course combines management thought, control theory psychology and systems thinking. It focuses on theory and techniques for building and sustaining an efficient, creative organization that promotes problem solving and collaborative learning. Learning organization principles of systems thinking, personal mastery, mental models, shared vision, team learning. Provides an introduction to control theory psychology with applications for improved personal interaction and a noncoercive approach for lead managing. Includes analysis of the conditions limiting an organization’s capacity to learn and remediation of organizational “learning disabilities.” **Credit 4**

**0697-444** **Self-Directed Learning in the Workplace**  
This multidisciplinary course provides a practical overview of self-directed learning: theory, design, development and implementation. Students examine self-directed learning from personal and organizational perspectives that include individual learning differences. Student projects focus on identifying learning objectives and utilizing a systematic approach for promoting active learning in the workplace. **Credit 4**

**0697-448** **Managing Learning and Knowledge**  
The new workplace requires new solutions. In this environment, training that is well-planned, presented and meets organization needs takes on a critical strategic role. This course is aimed at managers, team leaders, HR specialists and those involved in the continuous, self-directed, formal and informal learning needed to help their organizations improve their business success. Core topics include design and delivery of training, the needs assessment process, job and core competencies analysis, targeting learner populations and learner needs, training program design and program development issues. **Class 4, Credit 4**

**0697-451** **Preparing for the 21st Century**  
An interactive seminar for advanced students that focuses on interdisciplinary issues of wide interest and application. Course theme and content change periodically, ranging from negotiation and conflict resolution to microeconomic battle plans and organizational culture. Limited to qualified applied arts and science BS degree students. (Approval of adviser) **Credit 4**

**0697-452** **Special Topics**  
This course provides an overview of urban issues and how to develop action plans that address some of a city’s most critical challenges. Student teams will address issues of economic development, education, public safety, the quality of life and metropolitan solutions. **Credit 4**

**0697-462** **Empowered Leadership**  
This multidisciplinary course has a three-tier structure: a fundamental look at the theories and practices of leadership; a study of leadership styles and their impact on the work environment; and a reflection and self-analysis by the students of their leadership styles. Course work will include extensive readings, case studies, written reports and reflections. Much of the course will operate in a team manner. **Credit 4**

**0697-510** **Multidisciplinary Life**  
This is a required undergraduate capstone course for the applied arts and science bachelor’s program. Students should consult their adviser before registering. **Credit 4**

# E. Philip Saunders College of Business

## Index

0101	Accounting	30
0102	Management	30
0104	Finance	31
0105	Marketing	32
0106	Decision Sciences	32
0110	Business Legal Studies	33
0112	Management Information Systems	33
0113	International Business	34
0116	Consumer Finance	34

Course numbering: RIT courses are generally referred to by their seven-digit registration number. The first two digits refer to the college offering the course. The third and fourth digits identify the discipline within the college. The final three digits are unique to each course and identify whether the course is noncredit (less than 099), lower division (100–399), upper division (400–699), or graduate level (700 and above).

Unless otherwise noted, the following courses are offered annually. Specific times and dates can be found in each quarter's schedule of courses, published by the Office of the Registrar. Prerequisites/corequisites are noted in parentheses near the end of the course description.

## Accounting

### 0101-301 Financial Accounting

An introduction to the way in which corporations report their financial performance to interested stakeholders like investors and creditors. Coverage of the accounting cycle, generally accepted accounting principles and analytical tools help students become informed users of financial statements. **Credit 4**

### 0101-302 Management Accounting

Introduction to the use of accounting information by managers within a business. Explores the value of accounting information for the planning and controlling of operations, assessing the cost of a product/service, evaluating the performance of managers and strategic decision making. (0101-301) **Credit 4**

### 0101-335 Cost and Managerial Accounting

An extensive introduction to the use of accounting information by managers within a business. It explores the value of accounting information in planning and controlling operations, assessing the cost of a product/service, activity-based costing, evaluating the performance of managers and strategic decision making. (0101-301, sophomore status. Not for students who have received credit for 0101-302) **Credit 4**

### 0101-345 Accounting Information Systems

Emphasis is on developing a conceptual understanding of accounting information systems. This course combines information systems concepts, computer technology and accounting issues. Topics include computer security, information privacy, accounting cycles, specialized journals, systems development, computer crime, database applications, e-commerce and other information systems issues. Discussion of current literature and use of a computerized accounting system will be included. Students analyze accounting information systems topics through problem solving, essays, presentations, exams and case studies. (0101-301, sophomore status) **Credit 4**

### 0101-408 Financial Reporting and Analysis I

Extensive exposure to the accounting cycle with full integration of the data flow in an accounting information system. Accounting theory developed by accounting standard-setting bodies is covered in depth. Generally accepted accounting principles are discussed as they apply to the preparation of financial statements and the recognition and measurement of financial statement elements. (0101-301 and 0101-302 or 0101-335; junior status) **Credit 4**

### 0101-409 Financial Reporting and Analysis II

In-depth consideration of generally accepted accounting principles and theory as they apply to the recognition and measurement of noncurrent assets, liabilities and owner equities, including partnership accounting. Issues related to convertible securities and the computation of earnings per share are discussed. (0101-408, 0104-350, junior status) **Credit 4**

**0101-431 Cost Accounting**  
Development and use of cost data for external reporting and internal planning and control. Topics include cost estimation and prediction, job costing, process costing, joint product and by-product costing, service department cost allocation, standard costing, activity-based costing and transfer pricing. Development of relevant cost information for special purposes is also considered. (0101-302 or 0101-335, 0104-350, 1016-319) **Credit 4**

### 0101-494 Cost Accounting in Technical Organizations

A first course in accounting for students in technical disciplines. Topics include the distinction between external and internal accounting, cost behavior, product costing, profitability analysis, performance evaluation, capital budgeting and transfer pricing. Emphasis is on issues encountered in technology-intensive manufacturing organizations. (This course is not intended for College of Business students, junior status)

### 0101-522 Personal and Small Business Taxation

A basic introductory course in federal income taxation. Emphasis is on taxation of individuals and sole proprietorships. Topics include income measurement and deductibility of personal and business expenses. (0101-301, junior status) **Credit 4**

### 0101-523 Advanced Taxation

A continuation of Personal and Small Business Taxation. Emphasis is on tax treatment of property transactions and taxation of business entities. Also covers the use of technology to prepare complex returns and to research tax issues. (0101-522) **Credit 4**

### 0101-530 Auditing

A study of the legal, ethical and technical environment in which the auditor works. Current auditing theory, standards, procedures and techniques are studied. The audit process is studied to ascertain how it leads to the development of an audit opinion (0101-409) **Credit 4**

### 0101-540 Advanced Accounting

This course investigates the application of generally accepted accounting principles to corporations with investments in subsidiaries. Issues involving consolidated financial statements, including international topics, are considered. Also examined are objectives for not-for-profit and governmental entities and how these objectives affect their financial accounting and reporting. (0101-409, junior status) **Credit 4**

### 0101-550 Financial Accounting and Reporting Issues

A study of complex issues facing preparers and users of financial statements and how these issues are resolved. Topics include revenue recognition, accounting changes, deferred taxes, pensions and post employment benefits, leasing, cash flow statements, interim reporting and segment disclosures. (0101-409, senior status) **Credit 4**

### 0101-554 Seminar in Accounting

Advanced study of accounting topics reflecting contemporary issues and/or current technological advancements impacting the development, implementation and management of accounting systems in organizations. Seminar topics have ranged from ethics to computerized accounting systems. Topics for a specific quarter will be announced prior to the course offering. (0101-301, junior status) **Credit 4**

## Management

### 0102-250 The World of Business

Designed for first-year business students, this course provides an overview of the functions and processes of business organizations. Topics include the role and responsibility of the manager, the processes and functions of business, the impact of technology, delivering quality products and services, doing business in global environments, and career exploration. **Credit 4**

### 0102-310 Air Force Management and Leadership I

Integrated management and leadership courses emphasize the concepts and skills required of the successful young officer, manager and leader. The first course in a two-course sequence that includes applied written and oral communication techniques, coordination, history of management theory, analytic methods of decision making, strategic and tactical planning, various leadership theories and followership. Actual Air Force case studies are used to enhance the learning process. (ROTC) **Credit 5**

**0102-311** **Air Force Management and Leadership II**  
Integrated management and leadership courses emphasize the concepts and skills required of the successful young officer, manager and leader. The second course in a two-course sequence that stresses organizing, staffing, controlling, counseling, human motivation and group dynamics, ethics, managerial power and politics, managing change, career development and performance appraisal. Actual Air Force case studies are used to enhance the learning process. **Credit 5**

*Note: Other Air Force ROTC course listings can be found under the College of Applied Science and Technology.*

**0102-320** **Organizational Behavior**  
As an introductory course in managing and leading organizations, this course provides an overview of human behavior in organizations at the individual, group and organizational levels with an emphasis on enhancing organizational effectiveness. Topics include individual differences, work teams, motivation, communication, leadership, conflict resolution, organizational culture and organizational change. (Sophomore status) **Credit 4**

**0102-438** **Business Ethics**  
Awareness of core principles of ethical business behavior is an essential component for effective participation in business organizations. This course develops an understanding of ethical reasoning and how it is applied to current business issues. An important focus of the course is the development of ethical leaders. Students are exposed to several ethical and moral dilemmas, which are used to guide debate and discussion of issues such as advertising, affirmative action, human resource decisions, product liability, etc. (0102-320) **Credit 4**

**0102-455** **Human Resources Management**  
An overview of the human resource function in both large and small organizations. This course emphasizes how managers can utilize human resources to achieve organizational goals. Major topics studied include employee selection, compensation, training and development, performance evaluation and managing diversity. (0102-320, junior status) **Credit 4**

**0102-460** **Leadership in Organizations**  
Modern organizations are in search of effective leaders who can guide organizational members toward the attainment of organizational goals. This course will explore the character, personal attributes and behaviors of effective leaders in modern organizations. The course includes an overview of leadership research, theory and practice. (0102-320) **Credit 4**

**0102-490** **Entrepreneurship**  
This course studies the process of creating new ventures with an emphasis on understanding the role of the entrepreneur in identifying opportunities, seeking capital and other resources and managing the formation and growth of a new venture. It addresses the role of entrepreneurship in the economy and how entrepreneurial ventures are managed for growth. (Junior status) **Credit 4**

**0102-507** **Business, Government and Society**  
This course illuminates the role of ethics, social ideology and government policy and regulation in guiding business decisions and in enhancing business competitiveness. Special attention is given to the role of business in assessing technological opportunity and risk, managing product liability and victim compensation, directing the corporations in a manner consistent with public policy on the natural environment and developing policies that assure fair treatment of diverse individuals in the workplace. (Senior status) **Credit 4**

**0102-530** **Managing Innovation and Technology**  
This course focuses on commercializing technology and gives students the chance to work on real business projects involving new technology. Topics covered include the drivers of innovation, technology-driven entrepreneurship, managing different types of innovation and the construction of technology strategy for a firm or business unit. Students learn how to understand both technology and business perspectives as well as how to formulate a profitable technology strategy. Projects focus on current situations in real companies, including, on occasion, student-owned startup companies. (Junior or senior standing or permission of instructor) **Credit 4**

**0102-536** **Organizational Performance and Design**  
Applications of organizational design and theory to organizational performance, including traditional and emerging concepts that affect work organization performance, characteristics of high-performance organizations, and the interaction of organization and environment. May include a strengths/weaknesses analysis of an existing organization. (0102-320) **Credit 4**

**0102-545** **Applied Venture Creation and Entrepreneurship**  
This course enables students to gain course credit, in association with the RIT student development lab, for maturing a business concept, working on a multi-disciplinary product commercialization team, or working with an entrepreneurial venture. Students must apply for admission into this program and follow the guidelines provided by the RIT entrepreneurship program. (Instructor permission) **Credit 4**

**0102-547** **Field Experience in Business Consulting**  
Students nearing the completion of their program work in consulting teams to assist startup ventures and/or small businesses. Problems are isolated and solutions then developed. Affiliated course projects may focus on a number of areas. For example, they may seek to develop commercialization plans for specific technologies, products or services; focus on unique problems associated with small businesses and develop growth strategies. (0102-490, junior status or permission of instructor) **Credit 4**

**0102-551** **Strategy and Policy**  
A capstone course drawing upon all the business functions including accounting, finance, marketing, operations management and organizational theory. The course provides an integrated perspective of business organizations toward the achievement of enhanced profitability and a sustainable competitive advantage. Topics include the analysis of business environments, industry attractiveness, competition and the value chain. Students learn how to formulate and implement effective business- and corporate-level strategies. (0102-320, 0105-363, 0104-350, 0106-401, senior status) **Credit 4**

**0102-554** **Seminar in Management**  
Designed by individual instructor. (Varies by seminar content) (Permission of instructor, junior status) **Credit 4**

## Finance

**0104-220** **Personal Financial Management**  
Examines financial decisions people must make in their personal lives. Covers personal taxation, housing and mortgages, consumer credit, insurance (including life, health, property and casualty) and retirement and estate planning. Also reviews the common financial investments made by individuals, including stocks, bonds, money market instruments and mutual funds. This class involves extensive use of the Internet for access to information. Calculators are also used in the classroom. Prior to 20062, this course number was 0104-340. Students cannot receive credit for both course numbers. **Credit 4**

**0104-350** **Corporate Finance**  
Basic course in financial management. Covers business organization, time value of money, valuation of securities, capital budgeting decision rules, risk-return relation, CAPM, financial ratios, global finance and working capital management. (0511-402, 1016-319, 0101-301, and in second quarter of sophomore year or higher) **Credit 4**

**0104-359** **Financing New Ventures**  
Financing New Ventures focuses on financial issues affecting an entrepreneur. The course emphasizes, identifies and follows the wealth creation cycle, which begins with an idea for a good, product or service; progresses to an initial company startup; passes through successive stages of growth; considers alternative approaches to resource financing, and ends with harvesting the wealth created through an initial public offering, merger or sale. Identification and valuation of business opportunities, how and from whom entrepreneurs raise funds, how financial contracts are structured to both manage risk and align incentives, and alternative approaches by which entrepreneurs identify exit strategies are reviewed. (Junior status) **Credit 4**

**0104-361** **Financial Institutions and Markets**  
This course provides a comprehensive survey of the major financial markets and institutions in the U.S. and abroad. It analyzes the important structural features of the major markets and notes the interaction of the financial markets with the decisions of financial institutions, corporations and the government. (0104-220; 0116-221 or 0104-350) **Credit 4**

**0104-452** **Managing Corporate Assets and Liabilities**  
This advanced course in financial management covers project cash-flow analysis, issuance of securities, cost of capital, debt policy, dividend policy and marketing efficiency. (0104-350, junior status) **Credit 4**

**0104-453 Intermediate Investments**  
This course focuses on the financial investment problems faced by individuals and institutions. Theoretical topics include asset pricing, hedging and arbitrage. Application topics include risk management in bond and stock portfolio context. A discussion of options, futures and swaps also is included. (0104-350, junior status) **Credit 4**

**0104-460 Financial Analysis and Modeling**  
In this course, students learn to obtain and organize financial data and conduct financial analysis such as DCF analysis, risk analysis and financial forecasting. Sources of data include Web-based sources and proprietary databases. Excel will be the main software tool. (0104-452) **Credit 4**

**0104-504 Finance in a Global Environment**  
Discusses problems posed by the international financial environment in which corporations operate. In particular, students learn to quantify and manage risks arising from shifting exchange rates. Other topics include exchange rate systems, international trade finance, international capital budgeting, country risk analysis and long-term international financing. (0104-350, junior status) **Credit 4**

**0104-505 Advanced Corporate Financial Planning**  
This course focuses on strategic financial management of the corporation. It employs pedagogies that emphasize analysis and evaluation of applied financial problems. Topics include working capital management, financial statement analysis, valuation, capital budgeting decisions and risk management. (0104-452, junior status) **Credit 4**

**0104-520 Introduction to Options and Futures**  
This course explores risk management from the viewpoint of a finance professional. The primary tools are derivative instruments such as options, futures and swaps. Students learn about the basic features of derivative instruments: how to value them, how they are traded and how to use them to mitigate various types of financial risk. (0104-350, junior status) **Credit 4**

**0104-554 Seminar in Finance**  
Special topic seminars offer an in-depth examination of current events, issues and problems unique to finance. Specific topics will vary depending upon student and faculty interests and on recent events in the business world. Seminar topics for a specific quarter will be announced prior to the course offering. These seminars may be repeated for credit since topics will normally vary from quarter to quarter. (Permission of instructor, junior status) **Credit 4**

## Marketing

**0105-363 Principles of Marketing**  
An introduction to the field of marketing, stressing its role in the organization and society. Emphasis is on determining customer needs and wants and how the marketer can satisfy those needs through the controllable marketing variables of product, price, promotion and distribution. (Sophomore status) **Credit 4**

**0105-440 Internet Marketing**  
The course examines the impact of the Internet on traditional marketing and the new form of marketing. It explores the impact of the Internet on marketing strategy and tactics and explicitly considers using the Internet to increase the value delivered to customers and improve a firm's competitiveness. (0105-363, junior status) **Credit 4**

**0105-445 Business-to-Business E-commerce**  
The focus of this course is on the effective integration and coordination of various operations in e-business-to-business transactions. The course includes organizational and financial issues related to successful e-business operation, and it explores relationships among suppliers and buyers in these types of businesses. The course looks at the strategies and tactics that organizations can use to build and/or enhance their business-to-business relationships using electronic business tools and strategies. (0105-363, junior status) **Credit 4**

**0105-505 Buyer Behavior**  
A study of the determinants of consumer and business buying behaviors. Emphasis is on identifying customer needs, understanding the buying decision process and maintaining customer satisfaction. (0105-363, junior status) **Credit 4**

**0105-550 Marketing Management**  
A capstone course that gives the student in-depth knowledge of middle- and upper-management-level marketing problems and processes. Topics include tools used by marketing managers in the development, implementation and control of marketing plans. (0105-363, prior or concurrent registration in 0105-551, at least one co-op, senior status) **Credit 4**

**0105-551 Marketing Research**  
A study of research methods used to understand the changing needs of customers in order to guide the decision making of marketing managers. Topics include problem formulation, sources of marketing data, research design, data collection and analysis. (0105-363, 1016-319, junior status) **Credit 4**

**0105-553 Sales Management**  
A critical examination of the activities, functions, challenges and opportunities of the sales force manager. The sales management functions will be related to other sectors of the promotion mix as well as the remainder of the marketing mix. An examination of the long-term selling process will provide a foundation for this course. (0105-363, junior status) **Credit 4**

**0105-554 Seminar in Marketing**  
Current issues in marketing are the focus of the course. Topics have included direct and database marketing, pricing, advanced marketing research and other current issues in marketing, based on student and faculty interest. (0105-363, junior status) **Credit 4**

**0105-559 Professional Selling**  
Selling concepts, tools, strategies and tactics are discussed as they apply to both external and internal customers. Students learn and experience some of the problems faced and rewards earned by those in professional sales. Customer relationship management/partnering with customers and truly seeking to meet their requirements are discussed as keys to long-term success. (0105-363, junior status) **Credit 4**

**0105-560 Integrated Marketing Communications**  
An in-depth view of tools of advertising, sales promotion and public relations, personal selling, direct marketing and Internet marketing. Basic concepts of advertising using print, broadcast, Internet and outdoor media are studied. Planning, budgeting and the roles of advertising agencies are also covered. Students develop a comprehensive promotion plan beginning with the marketing strategy and ending with implementation and evaluation. The project, in which the student plans and prepares a promotion/advertising campaign for a product or service in consultation with the instructor, is an integral part of the course. (0105-363, junior status) **Credit 4**

## Decision Sciences

**0106-334 Management Science**  
A survey of quantitative approaches to decision making. Topics include formulation and solution of linear programming models, decision analysis and simulation. Involves use of computer software. (1016-319 or equivalent) **Credit 4**

**0106-401 Operations Management**  
A survey of production/operations management. Topics include quality control, total quality management, project management, forecasting, production planning, material requirements and capacity planning, inventory management, just-in-time, international operations, impact of technology and strategic considerations. (1016-319, junior status) **Credit 4**

**0106-405 Statistical Methods of Quality Control**  
Topics in this course include statistical process control (SPC) techniques (such as control charts, process capability analysis, etc.), acceptance sampling plans and some examples of reliability and design of experiment techniques. (1016-319 or equivalent) **Credit 4**

**0106-425 Tools for Total Quality Management**  
This course examines the concepts of quality. Perspectives include quality planning and improvement. The course addresses tools and techniques, including quality function deployment (QFD), six sigma, check sheets, Pareto diagrams, flow charts, histograms, run charts, statistical control charts and benchmarking. (Some background in statistics recommended) (Distance learning course, not for College of Business majors) **Credit 4**



0106-553

### Project Management

The course emphasizes concepts, techniques, methods, principles, problems and issues that are associated with project management. Students who complete this course will be able to plan, schedule, budget, estimate, control and monitor projects. In addition, they will also become familiar with resource allocation, resource loading, CPM, CMM, GANTT and PERT. The use of project management software will be a major part of the course. (0106-363, senior status) **Credit 4**

0106-554

### Seminar in Decision Science

Designed by individual instructor. (Varies by seminar content) (Permission of instructor, junior status) **Credit 4**

## Business Legal Studies

### 0110-305 Legal and Ethical Issues in Technology Intensive Environments

The course introduces RIT students to a variety of important legal issues, such as intellectual property and privacy, including statutory and case law, the regulatory environment and ethical issues that arise in technologically oriented areas, such as information technology and the life sciences. This is important as individuals are likely to encounter such issues throughout their lives and their careers. Along with technical knowledge, the ability to effectively deal with legal and ethical issues shapes professional successes and failures. (Sophomore status) **Credit 4**

0110-319

### Legal Environment of Business

The course introduces legal principles and their relationship to business organizations. Emphasis is on the laws and regulations that govern business. Explores the background and origin of the U.S. legal system, its law enforcement agencies and the legal procedures used by the government to enforce its law. **Credit 4**

0110-320

### Commercial Law

The course explores the impact of the Uniform Commercial Code on business operations. Emphasis on topics included on the certified public accounting exam. Topics include sales, commercial paper, corporations, partnerships, joint ventures, sole proprietorships, bailment and agency. Topical cases and examples are used to help the student grasp the business implications of the law and its nomenclature. A research project on legal issues is an important aspect of this course. (0110-319) **Credit 4**

0110-350

### Business Legal Research and Writing

This course will provide the student with the fundamental understanding of legal research, writing and analysis in the business environment. The course focuses on analyzing statutory, regulatory and case law research. The student will master library and computer research skills; learn how to analyze the information researched; and communicate in writing the substantive and analytical findings in the appropriate legal format. (0110-319) **Credit 4**

0110-410

### Business Entity Selection and Government Issues

This course examines the selection, formation, governance and dissolution of corporations, partnerships, LLCs, LPs, PCs, LLPs and other business entities. The course considers the important factors in selecting a business entity, including taxation, liability, financing and governance. Other topics include mergers, joint ventures, dissolutions, corporate due diligence and rights of minority shareholders. Although the course will be based primarily on New York law, it will also cover the advantages of incorporating in Delaware. Legal research and analysis is an integral part of the course. (0110-319, 0101-301 as prerequisite or co-requisite) **Credit 4**

0110-554

### Seminar in Business Legal Studies

Advanced study of business and legal topics reflecting contemporary issues and/or current technological advancements impacting the understanding of taxation, business and legal issues in organizations. Seminar topics may range from international intellectual property rights to interactivity between taxation, law and ethics. Topical coverage for a specific quarter will be announced prior to the course offering. (Junior status or instructor's approval) **Credit 4**

## Management Information Systems

0112-270

### Business Software Applications

This course provides students with hands-on experience with the analytical software tools and techniques that are in use today. Emphasis will be placed on the theory of spreadsheet and database development for supporting management decision making. The theory will be applied in the context of the tools to be used. **Credit 2**

0112-300

### Business Computer Applications

The primary focus of the course is to provide students with hands-on skills in using microcomputers as productivity tools in the workplace. Students will be exposed to a combination of advanced productivity software, including word processors, spreadsheets, presentation graphics and database management applications. Hands-on exercises and assignments will help to develop computer proficiency and problem-solving skills. **Credit 4**

0112-310

### Introduction to E-Business Technologies

This course gives students both a conceptual and hands-on understanding of the technology that supports today's e-business revolution. Students will study the technical infrastructure that enables business online and will also create e-business websites that will interact with "back end" databases to allow customer transactions. Students who complete this course will be able to approach technical decisions about e-business in an informed and effective manner. (0105-363 or equivalent, not for College of Business MIS majors) **Credit 4**

0112-315

### Business Information Systems Processes

Managers, professionals and business technologists manage, maintain or participate in business processes. This course is an introduction to the basic business processes involved in organizations and the information systems that support them. Students examine the relationship between business processes and information systems and the qualities of good information. Students observe how these concepts are applied through hands-on exposure to an enterprise resource planning (ERP) system, such as SAP R/3. **Credit 4**

0112-330

### Business Programming

Students in this class will learn the fundamentals of computer programming in the current computer language. Each student will analyze simple problem statements and design structured computer programs that implement solutions. Basic programming concepts will be introduced, including variables and data types, assignment and computation statements, conditional statements, repetitive constructs, file input and output, and simple data structures. (Sophomore status) **Credit 4**

0112-340

### Database Management Systems

This course introduces students with no prior database knowledge to the concept of databases and database management systems (DBMS). It includes basic and intermediate hands-on concepts for designing, implementing and querying databases using a current DBMS. (Sophomore status) **Credit 4**

0112-370

### Systems Analysis and Design

Students who complete this course will be able to design, redesign and model business processes. They will know how to conduct interviews; approach the design or redesign of business processes; model system designs; effectively communicate systems designs to various levels of management; approach the implementation of a new or redesigned system. (0112-315, sophomore status) **Credit 4**

0112-380

### Network Technologies

This course stresses a business-oriented approach to evaluating and selecting network technology. Students who successfully complete this course gain practical knowledge of network telecommunications technology, including hardware and software. They learn enough to allow them to help design systems that include network components. They are also able to discuss network issues with network engineers from a systems design perspective. Several versions of this course are taught throughout the institute. This one differs from the others in that, while covering the basics of network protocols, hardware and other technologies, it stresses a business evaluation model throughout. (0112-315, sophomore status) **Credit 4**

0112-385

### Information and Network Security

Provides a foundation to understanding security on the desktop and on the network, with particular attention to integrity and security of corporate assets (business data). This course emphasizes hands-on utilities for both prevention and detection in a mixed-O5 environment. (0112-380, sophomore status) **Credit 4**

**0112-405 Object-Oriented Business Programming**  
Object-Oriented Business Programming (OOP) will prepare students to plan and implement systems using the object-oriented approach. This course will build on earlier programming classes and will emphasize the programming practices of polymorphism, inheritance and data hiding. (0112-330, junior status) **Credit 4**

**0112-410 Object-Oriented Analysis and Design**  
Object-oriented analysis and design concepts and techniques are covered. Computer-aided software engineering (CASE) software and software quality metrics are introduced. Students who successfully complete this course and the prerequisite Systems Analysis and Design will have acquired knowledge of the full range of analysis and design concepts currently used in systems development. (0112-370, junior status) **Credit 4**

**0112-430 Web Systems Development**  
Students in this class will analyze business problems and develop data driven Web applications to solve them. An industry-level application server will provide the framework for integrating and deploying a set of client and server technologies to create these applications. Development skills will include presenting and receiving information through a website, validating entered information and storing entered information in text files or databases. Students will design solutions using hypertext markup language (HTML), client scripting and server programs for database and file access. (0112-330, 0112-340, junior status) **Credit 4**

**0112-440 Database Systems Development**  
This course builds on the basic concepts of the Database Management Systems course and introduces students to a real-world client/server database development environment with hands-on experience. Students completing the course should be able to create both the client side and server side of a relational database project, using a tool such as Oracle. (0112-340, junior status) **Credit 4**

**0112-450 Enterprise Systems**  
This course is an introduction to the concepts and foundations of enterprise resource planning systems and their role in modern organizations. Students in this class will analyze cross-functional business process integration and the enterprise resource planning (ERP) systems commonly used by organizations. Students will receive basic hands-on experience with a current ERP system, such as SAP R/3, and will utilize a series of exercises to explore how these systems are configured based on organizational structures and business process definitions. (0112-340, 0112-370, junior status) **Credit 4**

**0112-460 Software Quality and Testing**  
Students will learn the essential features involved in developing timely, cost-effective and high-quality software products that meet the users' requirements. They will examine the effective deployment of quality assurance procedures throughout the entire software development process. Other topics covered in this course will include quality concepts, development of quality assurance plans, implementation of verification and validation functions, selection of tools to support quality assurance and software testing and application of software metrics to measure quality. (0112-410, junior status) **Credit 4**

**0112-510 Designing the E-Business Organization**  
Students in this e-business course are required to propose and, to the extent possible, develop an e-business. The primary method for learning is the student's own pursuit of the problem solutions. Strategic, financial and technical perspectives will be emphasized. Most of the student work for this course will involve research and analysis of electronic marketplaces and ultimately the design and development of competitive e-businesses. (0112-310, 0105-440, 0105-445) **Credit 4**

**0112-520 MIS Project Management and Practice**  
This course unifies MIS students' education by having them complete a team project utilizing project management techniques. It provides an introduction to the concepts of project management and techniques for estimating, planning and controlling resources to accomplish specific project goals. The factors necessary for successful management of projects involving the development or enhancement of information systems and the role of project management in modern organizations are examined. Both technical and behavioral aspects of project management are discussed. (Completion of two junior-level MIS electives, senior status.) **Credit 4**

**0112-554 Seminar in MIS**  
Advanced study of MIS topics reflecting contemporary issues and/or current technological advancements impacting the development, implementation and management of information systems in organizations. Seminar topics have ranged from new technological developments to management security issues in MIS systems. Topics for a specific quarter will be announced prior to the course offering. **Credit 4**

## International Business

**0113-310 Global Business: An Introduction**  
Broad consideration of global business issues and strategies. Subject areas include the macro issues related to the economic, political and human environments of global business; i.e., how governments intervene in markets, business, etc. In addition the functional operations of a global firm will be examined. Note: Prior to Fall 2007, this course was numbered 0102-360. **Credit 4**

**0113-400 Managing in the Global Environment**  
This course explores the key implementation issues facing global businesses and those firms wishing to expand into the global arena. An emphasis is placed on issues related to the topic of culture. The course examines its impact on management, individuals, groups and how it affects organizational performance. Leadership styles, in the cross-cultural context, will be deconstructed as will communication, negotiation, risk tolerance and motivation. Note: Prior to Fall 2007, this course was numbered 0102-432. (0113-310; junior status; co-requisite 0102-320) **Credit 4**

**0113-430 Global Business: Special Issues**  
This course covers a variety of contemporary special-interest topics in the context of global business. Sample topics may include foreign direct-investment strategies, regions of the world such as Asia, Europe, etc., evolving institutional factors, or trade disputes. Note: Prior to Fall 2007, this course was numbered 0102-575. (0113-310, junior status) **Credit 4**

**0113-450 Marketing in a Global Environment**  
A study of the management challenges of marketing in foreign countries. Topics include the assessment of foreign markets, foreign customer requirements, entry strategies, foreign channel management, promoting internationally, transfer pricing and world-class quality. Note: Prior to Fall 2007, this course was numbered 0105-555. (0105-363, junior status) **Credit 4**

**0113-500 Strategy in the Global Environment**  
This course explores the strategic challenges faced by businesses operating in a global environment. It emphasizes the development and formulation of effective corporate strategies within specific global environments. It also addresses the unique characteristics, opportunities, challenges, institutions and approaches associated with corporate global strategy. Note: Prior to Fall 2007, this course was numbered 0102-465. (0311-310, senior status) **Credit 4**

## Consumer Finance

**0116-221 Money, Consumers and Family**  
The course examines contemporary theories of consumer behavior and household decision making that explain consumer-driven societies that have led to excessive spending, debt and the inability of many families to achieve personal financial goals. An evaluation of both individual and global spending and saving patterns is used to understand effective strategies to promote personal financial well-being. The consequences of poor financial decisions and their impact on the family are discussed, including health, marriage, career opportunities and other current issues. The purpose of the course is not to provide a set of tools to make financial decisions but rather an understanding of the basic economics of consumerism and its consequences and to give insights that will help students develop effective financial plans for themselves and to advise others. **Credit 4**

# B. Thomas Golisano College of Computing and Information Sciences

## Index

4002	Information Technology	35
4003	Computer Science	39
4006	Medical Informatics	42
4010	Software Engineering	42
4050	Networking, Security, and Systems Administration	43

*Course numbering: RIT courses are generally referred to by their seven-digit registration number. The first two digits refer to the college offering the course. The third and fourth digits identify the discipline within the college. The final three digits are unique to each course and identify whether the course is noncredit (less than 099), lower division (100–399), upper division (400–699), or graduate level (700 and above). Unless otherwise noted, the following courses are offered annually. Specific times and dates can be found in each quarter's schedule of courses, published by the Office of the Registrar. Prerequisites/corequisites are noted in parentheses near the end of the course description.*

**4001-211 Introduction to Programming Using C**  
An introduction to structured programming using C. Basic problem-solving techniques and algorithm development through the process of top-down, stepwise refinement are introduced throughout the course. Classical algorithms for the solution of numerical problems encountered in science and engineering are used to demonstrate the development of algorithms and their implementation in C. Programming projects will be required. May not be taken for credit by CS, SE or CE majors. (1016-251) **Credit 4**

## Information Technology

**4002-102 Freshman Honors Seminar**  
This course provides an introduction to the Honors program for all freshman GCCIS Honors students. The course provides an overview of GCCIS, its program and the requirements for the Honors program at the institute, college and program level. Honors students will hear discussions of the professional and research interests of faculty members from all three departments. **Class 1, Credit 0**

**4002-201 Freshman Seminar in Information Technology**  
An orientation seminar taken by first-year students in information technology. Topics include a curriculum overview, co-op and career alternatives in information technology, and orientation to RIT and college life. **Class 1, Credit 1**

**4002-206 Web Foundations**  
An introduction to Internet and Web foundations including electronic communication and information, basic HTML and WYSIWYG editors, Web page design, digital images, and website implementation and maintenance. There are no prerequisites. **Class 4, Credit 4**

**4002-208 Introduction to Programming**  
A first course in programming using C++ in writing modular, well-documented programs. Topics include an overview of problem-solving methods, C++ control structures and their uses, procedures and functions with parameters, elementary data types, arrays, records and modular programming. Weekly programming assignments stress features of structured programming and C++. (4002-206 or computer literacy; corequisite 4002-208 lab) **Class 3, Lab 2, Credit 4**

**4002-210 Programming with Classes**  
A second course in programming with emphasis on object-oriented programming. Students will first use classes and then build classes. Topics include information hiding through classes, construction of classes, operator overloading, friend functions, constructor functions and destructor functions. Inheritance and templates are also covered. Scheduled laboratory section and programming projects are required. (4002-208 or 4002-215 or 4002-217; corequisite 4002 210 lab) **Class 3, Lab 2, Credit 4**

**4002-211 New Media Perspectives**  
This course exposes new media students to the broad range of cultural, technological, aesthetic, political and business trends associated with the growth and evolution of digital media. Students are expected to engage in dialog and debate and begin to contribute to the intellectual life of the discipline. **Class 3, Credit 3**

**4002-217 Programming for Information Technology I**  
This is the first course in the introductory programming sequence required for all information technology students. Topics include elementary data types, arithmetic and logical operations, control structures and error handling, methods and functions, and an introduction to object-oriented programming design and implementation. Emphasis is on the development of problem-solving skills. Programming projects are required. (Computer literacy) **Class 5, Credit 4**

**4002-218 Programming for Information Technology II**  
This is the second course in the introductory programming sequence required for all students majoring in information technology. Topics include further exploration of classes and objects, programming through composition and inheritance, reusability, input/output, and object-oriented design. Emphasis is on the development of problem-solving skills. Moderately large programming assignments are required. (4002-217) **Class 5, Credit 4**

**4002-219 Programming for Information Technology III**  
This is the third course in the introductory programming sequence required for all students majoring in information technology. Topics include advanced interface concepts, traditional programming data structures, programming utilities and reusability, introductory project design and management concepts and other concepts as time permits. Emphasis is placed on the development of problem-solving skills. Large programming assignments are required. (4002-218 or 4002 221) **Class 5, Credit 4**

**4002-220 Programming for Information Technology IIA**  
This is the first of two courses that are equivalent to 4002-218. 4002-218 is the second course in the introductory programming sequence required for all students majoring in information technology. This course and the subsequent one (4002-221) cover the same materials covered in 4002-218, but they are designed for students that find programming difficult and would like to have more time to learn OOP concepts and programming techniques. Topics include further exploration of classes and objects, programming through composition and inheritance, reusability, and object-oriented design. Emphasis is on the development of problem-solving skills. Moderately large programming assignments are required. (4002 217) **Class 5, Credit 4**

**4002-221 Programming for Information Technology IIB**  
This is the second of two courses that are equivalent to 4002-218. 4002 218 is the second course in the introductory programming sequence required for all students majoring in information technology. This course and the previous one (4002-220) cover the same materials covered in 4002-218, but they are designed to help those students that find programming difficult and would like to have more time to learn OOP concepts and programming techniques. Topics include further exploration of classes and objects, programming through composition and inheritance, reusability, and object-oriented design. Emphasis is on the development for problem-solving skills. Moderately large programming assignments are required. (4002-220) **Class 5, Credit 4**

**4002-230 Introduction to Programming for New Media**  
This course provides an introductory programming experience to students of new media. Students will write scripts to implement navigational strategies and control the display of graphics, text, audio and video. The course will look at both event-driven and time-driven models of interaction. Students will employ the fundamental structures of computer programming such as loops, variables, parameters and functions in their scripts. They will learn iterative user-centered strategies for program design and implementation. (4002-320 or equivalent and 2009-411) **Class 4, Credit 4**

**4002-231 Programming for New Media II**  
As the second course in programming for new media students, this course continues an object-oriented approach to programming for interaction. Topics will include reusability, lists and other data structures, strategies for event-driven programming, object design and inheritance, and media synchronization. Emphasis is on the development of problem-solving skills as students develop moderately complex applications. Programming projects are required. (4002-230) **Class 4, Credit 4**

**4002-310 Digital Video for the World Wide Web**  
In the brave new world of rich content deliverables via the Web, we take for granted that students need a facility with images, animation and interactivity. Video becomes yet another increasingly important medium. It is used for illustration, instruction, entertainment and marketing. Students working with Web development require an understanding of its inherent qualities, limitations and how it may be implemented. This course will focus on video and specifically how to create and implement quality work suitable for Web delivery. (4002-230 or 4002-330) **Class 4, Studio Format, Credit 4**

- 4002-320 Introduction to Multimedia**  
This class provides an introduction to key Internet, Web, and multimedia technologies as well as familiarity with the Macintosh computer platform. Topics include computer-mediated communication, basic Internet applications such as telnet, FTP, the WWW, basic digital image, audio and video techniques, and Web page development and publishing. (4002-206 or computer literacy) **Class 4, Credit 4**
- 4002-330 Interactive Digital Media**  
Students will create interactive multimedia content for CD-ROM and the World Wide Web. They will capture, combine, control and synchronize video, audio, text and images using authoring environments such as Macromedia Director. Students will write event handlers to control interactive applications. Programming will be required. (4002-320 and 4002-218 or equivalent) **Class 4, Credit 4**
- 4002-350 Seminar in IT Co-op Preparation**  
This course provides sophomores, juniors and transfer students in information technology with an overview of job-seeking skills necessary to research, identify and secure a co-op position. The class meets for five consecutive weeks, beginning week one. (Sophomores, juniors, transfers or permission of instructor) **Class 2, Credit 1**
- 4002-360 Introduction to Database and Data Modeling**  
A presentation of the data modeling process and database implementation fundamentals. Data modeling, fundamental relational concepts, the process of normalization, relational algebra, SQL, and guidelines for mapping a data model into a relational database will be covered. Students will model a multimedia or text-only information problem and implement it with a commercially available database package. (4002-218 or equivalent and 1016-206) **Class 4, Credit 4**
- 4002-380 Game Design and Development I**  
This course addresses the history of video games as well as the analysis of games as a medium. Topics include the identification and assessment of types and genres within video games as well as how content shapes and is shaped by play in an interactive medium. Activities will include the creation of design documents and the development of playable prototypes. Some projects may require working in groups. Delivery in studio format. (4002-330 or 4002-231) **Class 4, Credit 4**
- 4002-381 Game Design and Development II**  
This course builds upon design documents and game assets created in the prerequisite course. The course focuses upon the creation and development of an industry-standard design document and playable levels in a game prototype. Key concepts in game design and development such as game world design, level design, level balancing, and game character development will be addressed. In addition, this course explores issues involving the development of online game communities. Some projects may require working in groups. Delivery in studio format. (4002-380) **Class 4, Credit 4**
- 4002-387 Data Structure and Algorithms for Game Programmers I**  
This course focuses upon the application of data structures, algorithms, and fundamental Newtonian physics to the development of video game applications and entertainment software titles. Topics include trigonometric functions in game systems, 2D coordinate systems, 3D coordinate systems, geometric primitives, geometric tests, vectors, matrices, principles of transformation, and inclusion tests. In addition, traditional data structures and manipulation techniques will be applied to the context of game and entertainment software. Furthermore, Newtonian principles such as speed, acceleration, force, work momentum and motion will be examined in the context of developing game and entertainment software. Programming assignments are a required part of this course. Delivered in studio format. (4002-330, 1016-206, 1017-211, 4003-233, 4002-219) **Class 4, Credit 4**
- 4002-409 Web Site Design and Implementation**  
This course builds on the basic aspects of HTML and multimedia programming that are presented in 4002-320 and 4002-330. An overview of Web design concepts, including usability, accessibility, information design and graphic design in the context of the Web, will be covered. Introduction to website technologies, including cascading style sheets and DHTML, will also be explored. (4002-320, 4002-330 and two-course programming sequence) **Class 4, Credit 4**
- 4002-414 Java for Programmers**  
An intensive survey of the Java programming language for experienced programmers. This course covers the creation of application programs. Topics include: basic language concepts (declaring and evaluation of data, statements, expressions, control flow, and input/output), object-oriented fundamentals, GUI interfaces, exception handling, debugging, threads, and the client/server environment. Programming projects will be required. (A two-course object-oriented programming sequence in a language other than Java) **Class 5, Credit 4**
- 4002-415 Ethics in Information Technology**  
This course introduces the various ethical issues that may present themselves in our concentration areas: human factors, database, networking, multimedia, gaming, system administration and programming. The class will start with a historical examination of ethics and, through research, presentations and discussions, will provide opportunities to learn why it is essential to understand the ethical implications of our professional activities. Topics include: global implications of technology, First Amendment, Fourth Amendment, security, intellectual property law, and personal responsibility. This is a blended learning course offering onsite and online delivery. (Second-year standing) **Class 4, Credit 4**
- 4002-416 Access and Accessibility**  
This course will examine the increasingly important problem of accessibility as it relates to the field of computing. Issues include accessibility for disabled people; assistive technologies; the effect of poverty on accessibility (the "digital divide"); restrictions on the use of public machines; and the moral, legal, and ethical issues associated with accessibility. (Third-year standing) **Class 4, Credit 4**
- 4002-417 Visual C++ for Programmers**  
This course covers the basics of C++ development in the Windows environment. Topics include the use of an integrated development environment, basic C++ syntax, pointers, and Windows specific programming techniques. Emphasis is on the development of problem-solving skills. Large programming assignments are required. Prior programming experience is required. Delivered in studio format. (4002-219 or 4002-414 or 4003-233 or equivalent programming experience) **Class 5, Credit 4**
- 4002-425 HCI 1: Human Factors**  
Human Computer Interaction (HCI) is a multidisciplinary field of study concerned with how humans interact with software and hardware interfaces. This course will focus on theories of human information processing and human behavior and their implications for user-centered design of interfaces. Topics include HCI history, cognitive psychology, user analysis, task analysis, and requirements analysis in the usability engineering process. (Second-year standing) **Class 4, Credit 4**
- 4002-426 HCI 2: Interface Design and Development**  
The design of usable interfaces is based on the principles and theories of human computer interaction. This project-based course is focused on the application of the usability engineering process, including analysis, design, prototyping and testing. Additional topics include: what is usability, heuristic evaluation, usability goal setting, interaction design and styles, assessment methods and international user interfaces. Team projects are required. (4002-425 or 2009-323 and 4002-330 or 4002-230 and preferably a co-op) **Class 4, Credit 4**
- 4002-434 Programming for Digital Media**  
Scripting is a major tool for digital media development. In this course, students will write programs starting from simple navigational scripts and evolving toward interactive object-oriented solutions to problems from domains such as simulation, gaming, instruction and artificial life. Students will build data structures and lists and implement classes to navigate through screens, implement interfaces and control media. Some projects may require working in groups. The class or instructor may create low-level routines and classes that will be used by students to complete programs of their own design. (4002-330 or 4002-231) **Class 4, Credit 4**

- 4002-455** **Needs Assessment**  
Complex problems in modern organizations require an information technologist to systematically analyze problem areas to determine the most effective and cost-efficient solutions. This course builds student skills in two different yet interacting areas: needs assessment (requirements analysis) and group problem solving. Students use interviewing and problem-solving techniques to uncover the constraints that surround problem areas. Students learn the questions to ask during needs assessment, along with developing the interpersonal skills to conduct these meetings. Emphasis is on the steps in creative problem solving, the basics of meeting planning to maximize group effectiveness and helping a client to focus concerns into a clearly defined problem. (Third-year standing and co-op) **Class 4, Credit 4**
- 4002-460** **Technology Transfer**  
Technology transfer is an umbrella term that refers to the creation, adoption and consequences of new technologies in a variety of settings. This course looks at how a new idea becomes implemented in a system (an organization or society) and the factors that influence its adoption. This course also looks at the influence of individuals and groups within the change process and how they affect the acceptance of new ideas. Finally, the course explores the prediction and consequences of new technologies. (Third-year standing and co-op) **Class 4, Credit 4**
- 4002-461** **Fundamentals of Data Modeling**  
Students will survey and master several contemporary graphic techniques used in data modeling and data requirements collection and analysis. Conceptual, logical and physical modeling will be compared and contrasted. Business rule formation and domain identification will be studied. Advanced functional dependency and domain-key normal forms will be examined in the context of requirements analysis. Object-oriented DBMS concepts and design issues will be surveyed. (4002-360) **Class 4, Credit 4**
- 4002-462** **Introduction to Bioinformatics Computing**  
This course will provide a theoretical and practical (lab-based) study of computational genomics. Techniques will be studied for quickly and effectively commandeering computing resources for the solution of problems raised in the realm of biology. Prior experience in programming and a basic understanding of molecular biology (central dogma) are required. Course topics include an express tour of some bioinformatics resources, exact and approximate pattern matching, sequence alignment, gene prediction, fragment assembly, multiple alignment, statistical and machine learning approaches. (Programming for IT 3 4002-219 or Computer Science 3 0603-233 or Java for Programmers 4002-318, Discrete Math I 1016-265) **Class 3, Lab 2, Credit 4**
- 4002-484** **Fundamentals of Database Client Servers**  
Students will configure, test and establish client-server communication and server-server communication with single or multiple database servers. Students will configure and demonstrate successful communication between a database file server and multiple external clients. Similarities and differences among commercially available connectivity packages will be explored. Low-level data and file structures used in the implementation of databases and database indexing will be explored. Programming exercises are required. New studio format. (4002 360 and 4002-219 or 4002-318) **Class 3, Credit 4**
- 4002-485** **Fundamentals of DBMS Architecture and Implementation**  
Students will be introduced to issues in client-server database implementation and administration. Students will configure, test and establish client-server communication and server-server communication with single or multiple database servers. Topics such as schema implementation, storage allocation and management, user creation and access security, backup and recovery, and performance measurement and enhancement will be presented in lecture and experienced in a laboratory environment. Students will configure and demonstrate successful communication between a database file server and multiple clients. (4002-360; co-requisite 4002-485 lab) **Class 3, Lab 2, Credit 4**
- 4002-486** **Implementation of Three-Tier DBMS Applications**  
Students will implement a three-tier DBMS application. Using a standard DBMS product, students will design and implement a database backend. Students will construct a Web server and implement client/Web server connectivity. Tools to monitor and measure such an implementation will be developed. Client-side, database server-side, and Web server issues associated with such a three-tier implementation will be investigated. Programming assignments are required. (4002-484, 4002-485 and 4002-539; co-requisite 4002-486 lab) **Class 3, Lab 2, Credit 4**
- 4002-487** **Data Structures and Algorithms for Game Programmers**  
This course continues the investigation into the application of data structures, algorithms, and fundamental Newtonian physics required for the development of video game applications and entertainment software titles. Topics include techniques for 3D orientation, angular displacement, Euler angles, quaternion representations and operations, barycentric coordinates, classifiers, recursion, clipping, culling and advanced partitioning techniques. In addition, advanced data structures such as trees and graphs will be investigated from the context of game application and entertainment software development. Furthermore, the course will examine advanced Newtonian principles used in games and simulations. Programming assignments are a requirement for this course. Delivered in studio format. (4002-387 and 4002-417) **Class 4, Lab 0, Credit 4**
- 4002-495** **Honors Capstone Project**  
The student will work independently under the supervision of a faculty adviser on a topic not covered in other course work. (Completion of all institute Honors academic requirements) **Credit variable 1-4**
- 4002-499** **Information Technology Co-op**  
A cooperative educational experience is available for those students who participate in order to gain industrial experience. **Class 0, Lab 0, Credit 0**
- 4002-501** **Foundations of 2D Graphics Programming**  
Use of an advanced graphics API to access hardware-accelerated graphics. Discussion of scene graphs, optimizations, and integration with the API object structure. Advanced use of the API calls in the production code to construct environments capable of real-time performance. (4002-434 or 4003-570) **Class 4, Credit 4**
- 4002-502** **Foundations of 3D Graphics Programming**  
Use of a graphics API to access hardware-accelerated graphics. Discussion of the API scene graph, 3D optimizations, and integration between the 2D graphics mode and a 3D immediate mode implementation. This course builds upon students' previous work and extends it in the construction of a fully functional 3D engine with library construction for game development. (4002-501) **Class 4, Credit 4**
- 4002-510** **Fundamentals of Instructional Technology**  
The world of information technology offers the possibility of transforming the way that instruction is designed and delivered. However, few information technology professionals understand the methods and materials of instructional design. As a professional in information technology, a student may be responsible for designing instruction either in a business or an educational context. This course enables the student to plan, organize and systematically develop instructional materials. The course uses an instructional systems design (ISD) model to analyze, design, deliver and evaluate instruction. (Third-year standing) **Class 4, Credit 4**
- 4002-512** **Interactive Courseware**  
Computer software that teaches is referred to as courseware. This course was designed to help you make the transition from "general" Instructional Design (4002-722/510) into the actual application of these principles in a computer-based environment. Although the basic principles of instructional design hold true in all media environments, using these teaching and learning principles is somewhat different when developing instruction that will be delivered by computer. This course teaches procedures that have already been successful in the design and development of courseware. (4002-510 and either 4002-330 or 4002-409) **Class 4, Credit 4**
- 4002-518** **Visual Basic for Programming**  
An introduction to the Visual Basic programming language for experienced programmers. Introductory topics include the Visual Basic development environment, intrinsic controls, data types, control structures, procedures and functions, arrays, user-defined types and file handling. Object-oriented programming and design topics are covered, including classes and objects, composition, inheritance and collections. Programming exercises are required. (4002-219 or 4002-318) **Class 4, Credit 4**

- 4002-525 Performance Support Systems Design**  
An electronic performance support system (EPSS) is a software technology designed to give each user what he or she needs when he or she needs it. It is designed to enable skilled performance without training. An EPSS can be defined functionally by what it does. The job of an EPSS is to help a worker perform his/her job better. Typical components of an EPSS encompass tutorials, drills, simulations and hypertexts but often include expert systems, help systems and intelligent job aids. This course examines some of the relevant literature supporting EPSS and provides students with the opportunity to design and develop several different components of a performance support system. (4002-510 and 4002-218 or equivalent) **Class 4, Credit 4**
- 4002-527 Digital Audio and Computer Music**  
Technologies and techniques for producing and manipulating digital audio and computer music are explored. Topics include digital representation of sound, synthesis techniques, digital audio recording and processing, MIDI and real-time performance issues, algorithmic composition, and application of digital audio to multimedia and Web production. (4002-330 and third-year standing) **Class 4, Credit 4**
- 4002-528 Writing for Interactive Media**  
As more of our communications are delivered on interactive, non-linear platforms, the information should be developed in ways that take advantage of these technologies. This course will focus on the creation of a variety of different hypermedia/multimedia documents designed, drafted and delivered in hard copy and/or digital form. (4002-409) **Class 4, Credit 4**
- 4002-529 Introduction to VRML**  
This course will focus on basic and advanced concepts of 3D environment creation and implementation within the virtual reality markup language (VRML) implemented on the World Wide Web. Students will work individually and in groups to create VRML environments on their own home pages and in a larger scale group environment. Studio format. (4002-409, 4002-434) **Class 4, Credit 4**
- 4002-535 Network-Based Multimedia**  
This course presents fundamental topics of designing and implementing multimedia on the Internet. Each topic is presented along with the underlying computer technology that supports it and hands-on projects incorporating the concepts. As the technology of interactive multimedia on the Internet changes, this course will present the current practice in preparing multimedia for cross-platform delivery to the growing audience of Internet users. Using the capabilities of current Web browser client and HTTP server technology, students will implement interactive multimedia for a variety of applications. (4002 330 and 4002-409) **Class 4, Credit 4**
- 4002-536 Web Client Side Programming**  
This course will explore the possibilities and purpose of client side scripting over the Internet. Students will learn to use both native and plug-in technologies to build interactive interfaces that are usable and effective. Key features that will be addressed are browser compatibility, object reusability (bandwidth issues) and different scripting environments. Programming is required. (4002-409 or equivalent) **Class 4, Credit 4**
- 4002-538 Multi Users Media Spaces**  
This course will focus on the development of interactive applications that use network connectivity to allow multiple users to interact with each other in real time and in a persistent virtual community. The course will integrate multiple technologies dealing with connectivity, database access, server-side logic and object-oriented programming environments. Important human computer interaction (HCI) issues will be raised around design and processing of messages and the traffic patterns generated by multi-user messaging. (4002-434 and third-year standing) **Class 4, Credit 4**
- 4002-539 Programming for the World Wide Web**  
The World Wide Web is no longer just linked, static HTML documents. Web pages can be generated dynamically and can interact with a user to modify pages on the fly, validate user inputs and entertain. This course is an overview of several forms of programming that are used in the creation of interactive and dynamic Web content. This course provides a practical overview of programming in the context of the World Wide Web. It enables students to develop Web pages and websites that incorporate both client-side and server-side programming by installing and modifying existing scripts as well as writing new scripts. (4002-409) **Class 4, Credit 4**
- 4002-541 Data-Driven Media Programming**  
This course focuses upon the construction of time-based multimedia software that is data driven. Topics include the storage and retrieval of multimedia content such as text, image, audio and video. In addition, the course will focus upon how media content can be managed both locally and remotely through flat files and database systems. The course emphasizes various server technologies and communication protocols that are appropriate to the delivery of data to multimedia applications. Furthermore, the course examines how to transform media types at various points along a data pathway in a variety of forms. Large-scale programming projects are required for this course. (4002-231 or 4002-330, 4002-360, and 4002-539) **Class 4, Studio Format, Credit 4**
- 4002-546 Web Client Server Programming**  
When building sophisticated Web applications, client and server technologies are used together to create possible Web-based applications. This course will explore the creation of such integrated applications, exploring topics such as dynamic creation of Web technology based applications in a client-server environment. Programming projects are required. Active learning format. (4002-536 and 4002-539) **Class 4, Active Learning Format, Credit 4**
- 4002-549 Usability Testing**  
This project-based course will focus on the formal evaluation of user interfaces. Topics include usability test goal setting, recruitment of appropriate users, design of test tasks, design of the test environment, test plan development and implementation, analysis and interpretation of the results, and documentation and presentation of results and recommendations. (4002-426 and 1016-319) **Class 4, Credit 4**
- 4002-560 New Media: Team Project I**  
The first course in a two-quarter sequence designed to engage the new media major in a "capstone" production experience. The instructors will form student teams that will design and complete a multimedia campaign for organizations selected by the instructors. (Fourth-year standing) **Class 4, Credit 4**
- 4002-563 Advanced Bioinformatics Computing**  
This course will provide in-depth exposure to advanced techniques in computational genomics. Topics may include: gene finding, genetic algorithms, hidden Markov models, neural networks, gene expression analysis, clustering algorithms, probabilistic models of evolution, phylogenetic trees, simple and complex diseases, gene mapping, SNP analysis, machine learning, molecular network analysis, probabilistic framework for modeling and inference, systems biology. (Introduction to Bioinformatics Computing) **Class 3, Lab 3, Credit 4**
- 4002-565 New Media: Team Project II**  
The second course in a two-quarter sequence designed to engage the major in a "capstone" production experience. Students continue work to completion of their new media group production project. Each group is required to test its product with a focus group and provide written feedback and analysis. (Fourth-year standing and 4002-560) **Class 4, Credit 4**
- 4002-571 Application Programming**  
This course will illustrate advanced programming topics using an object-oriented language. It will build on the material covered in the introductory programming courses. Topics include the use of common programming tools, working with component models, simple graphics programming, application development spanning multiple languages, and security models. Emphasis will be on the development of problem-solving skills. Programming assignments will be required. Studio format. (4002-219, 4002-318, or 4002-714) **Class 5, Studio Format, Credit 4**
- 4002-572 Distributed Application Programming**  
This course will expose students to advanced programming topics using an object-oriented language. It will build on the material covered in the introductory programming courses. Topics include distributed programming using various APIs and the development of server side applications. Emphasis will be on the development of problem-solving skills. Programming assignments will be required. Studio format. (4002-219 or 4002-318 or 4002-714) **Class 4, Studio Format, Credit 4**
- 4002-575 Local Data Integration**  
In this course, students will learn how to utilize state-of-the-art techniques such as XML to address the issues of data integration between computer programs of disparate language platforms. Programming projects will be required. Active learning format. (Third-year standing and 4002-219 or 4002-414) **Class 4, Active Learning Format, Credit 4**

**4002-576 Remote Data Integration**  
Exchange of information between programs running on disparate software and hardware platforms across domains can be a significant problem. In this course, students will learn how to leverage the loose coupling of service-oriented architectures to address the issues of data integration between these types of computer programs when executing across domains. Programming projects will be required. (Third-year standing and 4002-219 or 4002-414) **Class 4, Credit 4**

**4002-590 Seminar in Undergraduate Applications of Computer Technology**  
Current topics and advances in applications of computer technology for undergraduate students. (Permission of instructor and third-year standing) **Class 4, Credit 4**

**4002-599 Independent Study**  
The student will work independently under the supervision of a faculty adviser on a topic not covered in other courses. (Proposal signed by a faculty member) **Credit variable 1-8**

## Computer Science

**4003-102 Freshman Honors Seminar**  
This course provides an introduction to the Honors program for all freshman GCCIS Honors students. The course provides an overview of GCCIS, its program and the requirements for the Honors program at the institute, college and program levels. Honors students will hear discussions of the professional and research interests of faculty members from all four departments. (Restricted to computer science Honors program students in their first year of study at RIT)

**4003-203 Advanced Placement in C++**  
This course is used only for the purpose of transferring in advanced placement (AP) credit. Amount of credit (either 4 or 8 credit hours) will depend upon the student's score in the AP exam. Transfer credit of 4 credit hours will be granted for scores representing mastery of the principles of programming. Topics include variables, expressions and assignment, control structures (sequencing, selection and repetition), objects, procedures and functions, parameter mechanisms, recursion, one- and two-dimensional arrays. Transfer credit of 8 credit hours will be granted for scores representing mastery of the above principles and basic data structures. These topics would include arrays, records, pointers, dynamic storage allocation, linked lists, stacks, queues, and trees. May not be taken for credit. **Credit 4-8**

**4003-204 AP Java**  
This course is used only for the purpose of transferring in advanced placement credit. Amount of credit (either 4 or 8 credit hours) and placement will depend both on which version of the AP exam is taken and what score is achieved. Transfer credit will be granted for scores representing mastery of basic programming methodology, general problem-solving strategies, common data structures and algorithm development. Topics include variables, expressions, operators and assignment, control structures, primitive reference types, conversions between types, objects, classes and interfaces (including instance and static variables and methods, constructors, parameter passing and returning values), inheritance (polymorphism, overloading and overriding methods), basic exceptions, strings, one- and two-dimensional arrays, standard data structures and standard implementations using classes and interfaces found in the collections framework. **Credit 4-8**

**4003-231 Computer Science 1**  
The goal of this course is to introduce the student to the science of computing. The student will learn about the basic elements of computing, including problem decomposition, design and implementation of solutions, testing those solutions and integrating pieces of solutions together. Object-oriented technology is used as a means to an end to design solutions and actually implement them in software. Java is the language used; it is an object-oriented programming language that was designed for developing large systems from reusable components. Programming assignments, labs and post-labs, are an integral part of the course. **Class 4, Lab 2, Credit 4**

**4003-232 Computer Science 2**  
This course continues the Java-based introduction to basic computer science concepts begun in Computer Science 1. Essentially, this course covers the use of object-oriented programming to design and implement software solutions. Students will learn how to implement a solution to a problem by reusing existing components and creating new components using inheritance. Other topics include exception handling, files/streams, collections, threads and thread synchronization, graphical user interfaces (GUIs), networking, and event-driven programming. Programming projects, labs and projects are an integral part of the course. (4003-231) **Class 3, Lab 2, Credit 4**

**4003-233 Computer Science 3**  
This course is the third in the computer science introductory sequence and builds upon the computer science foundations and design principles presented in Computer Science 1 and Computer Science 2. Students will learn how to use linear data structures, such as stacks, queues and lists, and non-linear data structures, such as trees and graphs, and will also be introduced to the design and analysis of algorithms. Students will learn how to analyze the efficiency of basic sorting, searching and hashing algorithms and acquire an understanding of how recursion works. Object-oriented programming will be used to design solutions and implement them as Java programs. Programming assignments, labs and projects are an integral part of the course. (4003-232) **Class 3, Lab 2, Credit 4**

**4003-236 Computer Science for Advanced Placement**  
This accelerated course covers material from Computer Science 1, 2 and 3 and provides the foundation for all subsequent computer science courses. This course covers modern software development techniques and introduces essential software tools. Topics include the Java collection and file input/output frameworks, graphs, multi-threaded programming, network distributed programming, graphical user interfaces, and event-driven programming. Laboratory and project programming assignments are an integral part of the course. It is based on performance on the computer science AB advanced placement exam or approval by the course coordinator. (Department approval required)

**4003-263 Computer Science for Transfers**  
This course introduces the student to the object-oriented paradigm, the computer science workstation environment and the Java language. Topics include class design and implementation, inheritance, exceptions, files, threads, swing, and network programming. Students work individually and in small groups on programming assignments, which are an integral part of the course. This course is intended for students with previous programming experience and a background in data structures. Open only to transfer students. Not to be taken as a computer science elective. (Departmental approval required) **Class 4, Lab 2, Credit 5**

**4003-309 C for C++ Programmers**  
A study of low-level programming techniques in the C language. Pointer techniques and the use of pointers are emphasized. The course covers C operators, native arrays, strings, unions and the C library. Techniques for implementing polymorphism and generic data types are covered. Programming projects will be required. (This course may not be taken for credit simultaneously with 4003-406. Students who receive credit for 4003-406 may not later take 4003-309 for credit.) (4003-334) **Class 2, Credit 2**

**4003-334 Computer Science 4**  
A course on design techniques and advanced programming. Topics include the software development life cycle, analysis and design techniques, programming in C++ and implementation strategies for external data techniques. Students will work individually and in small groups on programming assignments, which will be an integral part of the course. UML and C++ programming language will be used. (C or better in 4003- 233, 263 or 236) **Class 3, Credit 4**

**4003-341 Professional Communications**  
An introduction to the types of communication that are part of the life of a computing professional. Topics include analysis of purpose of a document or report and writing effectively for the expertise and interests of the intended audience. Writing assignments will cover reports, specifications and user documentation. Oral reports and presentation skills also are emphasized. Small and large group activities will be used to simulate a wide range of work and communications environments. (4003-233 or 4003-263 as a corequisite) **Class 4, Credit 4**

**4003-345 Computer Organization**  
An introduction to computer architecture and assembly language programming concepts and techniques. Topics include Boolean algebra, combinational and sequential circuit design, storage mechanisms and their organization, the instruction cycle in a simple CPU, assembly language programming, programming at the device level, and the role of assembly language in understanding the hardware/software interface. Digital logic and software projects will be required. (4003-334, 1016-351) **Class 4, Credit 4**

**4003-380 Introduction to Computer Science Theory**  
This course provides an introduction to the theory of computation, including formal languages, grammars, automata theory, computability and complexity. (1016-265, 1016-366) **Class 4, Credit 4**

- 4003-406** **Systems Programming I**  
This course is an introduction to systems programming concepts and techniques. Topics include the Intel system architecture, its assembly language, the C language, and how to use these tools to interact with the low-level hardware and the Unix operating system. (Students who receive credit for this course may not later take 4003-309 for credit.) (4003-334; 4003-352 or 4003-345) **Class 4, Credit 4**
- 4003-410** **Introduction to CS Research**  
This course introduces students to current research topics in computer science. It explores writing, reading, presenting and evaluating research in the computer science discipline. Problem-solving skills in the context of research projects will be emphasized. Students will be provided with an opportunity to attend seminars and presentations by individuals conducting research in computer science. (Honors students with third-level standing in computer science or permission of instructor) **Credit 2**
- 4003-420** **Data Communication and Networks I**  
This course is an introduction to the concepts and principles of computer networks. Students will design and implement projects using application protocols and will study transport, network, and data link protocols and algorithms. The course also includes an introduction to local area networks, data transmission fundamentals, and network security. Programming projects will be required. (4003-334, 1016-351) **Class 4, Credit 4**
- 4003-440** **Operating Systems I**  
A general survey of operating system concepts. Topics include process synchronization, inter-process communication, deadlock, multiprogramming and multiprocessing, processor scheduling and resource management, memory management, overlays, static and dynamic relocation, virtual memory, file systems, logical and physical I/O, device allocation, I/O processor scheduling, process and resource protection. Programming projects will be required. (4003-334 and 4003-345) **Class 4, Credit 4**
- 4003-450** **Programming Language Concepts**  
A study of the syntax and semantics of a diverse set of high-level programming languages. The languages chosen are compared and contrasted in order to demonstrate general principles of programming language design. This course emphasizes the concepts underpinning modern languages rather than the mastery of particular language details. Programming projects will be required. (4003-334; 1016-265) **Class 4, Credit 4**
- 4003-451** **XML Architecture, Tools and Techniques**  
This course is a critical review of the XML standard and its major applications for data description, transformation, storage and transport and its role as a meta language for little languages used within software development and network communication. XML as a tool for language design is compared to a parser-generator-based approach. The implementation of XML parsing is compared to other forms of language recognition. Students are expected to complete programming assignments, some involving Java, and give a team presentation about an XML-based technology available from the Internet. (4003-233 or 4003-236 or 4003-263 or permission of instructor) **Class 4, Credit 4**
- 4003-455** **Artificial Intelligence**  
An introduction to the field of artificial intelligence, including both theory and applications. A programming language that allows effective symbolic manipulation is used to demonstrate the capabilities and limitations of the material presented in class. Topics include search strategies and their implementation; logic; networks; frames and scripts; productions; symbolic manipulation and list processing; problem-solving methods; expert systems; natural language understanding; and selections from vision, robotics, planning and learning. Programming assignments are an integral part of the course. (4003-450) **Class 4, Credit 4**
- 4003-456** **Expert Systems**  
An introduction to the issues and techniques employed in expert systems. Topics include a consideration of successful existing systems, control strategies, expert system building tools and environments, knowledge acquisition and uses of expert systems technology. Students will participate in group projects involving both the creation of an expert system and explorations of ways to effectively use such systems. (4003-455) **Class 4, Credit 4**
- 4003-457** **Introduction to Computer Vision**  
An introduction to the underlying concepts of computer vision and image understanding. The course will consider fundamental topics, including image formation, edge detection, texture analysis, color segmentation, shape analysis, detection of objects in images and high-level image representation. Depending on the interest of the class, more advanced topics will be covered, such as image database retrieval or robotic vision. Programming assignments are an integral part of the course. (Third-year standing in computer science) **Class 4, Credit 4**
- 4003-471** **Privacy and Security**  
This course provides students with an introduction to the issues surrounding security of computer systems and privacy concerns in an information-based society. The class will consider numerous social issues in computing, including risks and liability involved in using information, as well as ethical concerns. Case studies will be used to illustrate both common and historic problems in computer security. Group and individual programming projects will be used to improve understanding of security issues. Students will research a specific area of interest. (4003-420, 4003-440) **Credit 4**
- 4003-480** **Formal Languages**  
Formal language theory and principles. Topics include regular, context-free and context-sensitive grammars, finite automata, pushdown automata and Turing machines, and an introduction to unsolvability and computability. (4003-380) **Class 4, Credit 4**
- 4003-481** **Complexity and Computability**  
This course provides an introduction to the theories of complexity and computability. It covers undecidability, time and space complexity, reductions and completeness. (4003-380) **Class 4, Credit 4**
- 4003-482** **Cryptography**  
This course provides an introduction to cryptography and its relation to security. It covers classical cryptosystems, private-key cryptosystems (including DES and AES), and public-key cryptosystems (including RSA). The course also provides an introduction to integrity and authentication. (4003-334; 1016-265) **Class 4, Credit 4**
- 4003-485** **Database Concepts**  
A broad introduction to database management systems (DBMS) and the design, implementation and applications of databases. Topics include an overview of DBMS architectures, concepts and implementation of the relational model, SQL, database design and modeling techniques, and issues such as recovery, concurrency, physical implementation concerns, and performance and management aspects. Optional topics include alternative approaches to designing database systems (for example, object-oriented or extended relational systems), distributed databases, database machines, and database interfaces and languages. A database programming project is required. (4003-334) **Class 4, Credit 4**
- 4003-486** **Database System Implementation**  
This course covers data structures and algorithms used to implement database management systems. Topics include physical data organizations, indexing and hashing, query processing and optimization, database recovery techniques, transaction management, concurrency control and database performance evaluation. Programming projects will be required. (4003-485) **Class 4, Credit 4**
- 4003-499** **Computer Science Co-op**  
Computer science co-op work block. One quarter of appropriate paid work experience in industry. Four quarters of co-op experience are required. **Credit 0**
- 4003-506** **Systems Programming II**  
Application of operating system concepts to the design of hardware interfaces for a multiprogramming environment. Laboratory work includes developing multiprogramming (optionally, multiprocessing) kernel with system call and interrupt handling facilities and building device drivers for a variety of peripheral devices. This course provides extensive experience with those aspects of systems programming that deal directly with the hardware interface. A significant team programming project is a major component of the course. (4010-361, 4003-406 and 4003-440) **Class 4, Credit 4**
- 4003-515** **Analysis of Algorithms**  
This course provides an introduction to the design and analysis of algorithms. It covers a large number of classical algorithms and their complexity and will equip students with the intellectual tools to design, analyze, implement and evaluate their own algorithms. (4003-334, 1016-366) **Class 4, Credit 4**



- 4003-520 Computer Architecture**  
Computer Architecture is a study of the design of both modern and classic computer hardware. Topics include a review of classical computer architectures; the design of operation codes and addressing modes, data formats, and their implementation; internal and external bus structures; architectural features to support virtual storage and page-replacement policies; high-level language features, and operating systems. Students will write programs that simulate the organization of several different processor architectures to help further their understanding of design choices. (4003-440) **Class 4, Credit 4**
- 4003-530 Fundamentals of Discrete Simulation**  
An introduction to discrete simulation modeling. Methods for the design of discrete simulation models are examined, and simulation models are designed and implemented using a general purpose discrete simulation language. Related topics such as the validity and appropriateness of general statistics for the model are covered. Both the theoretical and statistical aspects of modeling are examined. Programming projects are required. (0106-352; third-year standing in computer science) **Class 4, Credit 4**
- 4003-531 Parallel Computing I**  
Parallel Computing I is the study of the hardware and software issues in parallel computing. Topics include an introduction to the basic concepts, parallel architectures and network topologies, parallel algorithms, parallel metrics, parallel languages, granularity, applications, parallel programming design and debugging. Students will become familiar with various types of parallel architectures and programming environments. (4003-440 or permission of the instructor) **Class 4, Credit 4**
- 4003-532 Parallel Computing II**  
Parallel Computing II is a collaborative learning course. Students will agree on the topics for the course, will prepare and present one of the agreed upon topics, and will lead the discussion session for another lecture. In addition, parallelism will be applied to real-world interdisciplinary projects. (4003-531) **Class 4, Credit 4**
- 4003-541 Data Communications and Networks II**  
This course continues the study of computer networks begun in 4003-420 Data Communications and Networks I, emphasizing design principles and theoretical aspects of networks. Topics include the nature of communications media and signaling methods, analog and digital transmission, data link protocols, protocol proof techniques, routing, broadcasting, multicasting, connection, disconnection and crash recovery protocols, Internetworking and security, and network analysis and design using graph theory and queuing theory. (1016-351, 4003-334) **Class 4, Credit 4**
- 4003-542 Data Communications and Networks III**  
This course will build on topics developed in 4003-420 Data Communications and Networks I and 4003-541 Data Communications and Networks II in a lab setting. Students will be required to design and implement small computer network addressing issues such as routing strategies, virtual circuits vs. datagrams, data link protocols, and user (presentation) level services. (4003-406 and 4003 541) **Class 4, Credit 4**
- 4003-543 Ad Hoc Networks**  
This course explores serverless ad hoc networks. Topics include authentication, confidentiality, routing, service discovery, middleware and key generation and key distribution. Programming projects are required. (4003-233 and 4003-420) **Class 4, Credit 4**
- 4003-544 Operating Systems II**  
This course is a more in-depth look at the concepts in Operating Systems I (4003-440). Laboratory work includes implementing components of a pedagogical operating system as a team project through the entire term. Each team will design and implement the software for thread synchronization abstractions, loadable user processes, virtual memory and a file system. An emphasis will be placed on the software engineering of each component as it is added to the overall operating system. (4010-361 and 4003-440) **Class 4, Credit 4**
- 4003-552 Artificial Intelligence for Interactive Environments**  
This course delves into the use of artificial intelligence in interactive environments. These environments range from the entertaining nature of role-playing games to more serious military simulations. In all these environments, agents and groups of agents must interact in an intelligent manner. Topics will include advanced pathfinding algorithms, sensory systems, group tactical strategies, and learning algorithms. Projects are an inherent part of the course. (4003-455 or permission of the instructor) **Class 3, Credit 4, Lab 1**
- 4003-553 Biologically Inspired Intelligent Systems**  
This course examines contemporary topics in artificial intelligence in neuroscience, cognitive science and physiology. Students will focus on developing computer models that are biologically inspired and leverage current knowledge in these areas with the goal to develop systems that understand their environment. A programming project will be required. A background in biology is not required. (Third-year standing or higher in computer science or instructor permission) **Credit 4**
- 4003-558 Advanced Computer Vision**  
This course examines advanced topics of current research interest in computer vision, including motion analysis, video processing and mode-based object recognition. The topics will be studied with reference to specific applications; for example, video interpretation, robot control, road traffic monitoring and industrial inspection. A programming project will be required. (4003-457) **Credit 4**
- 4003-560 Compiler Construction Lab**  
A course in the design and implementation of high-level language compilers. Laboratory projects are assigned in the areas of parsing, code generation, code optimization and language design. (4003-580) **Class 4, Credit 4**
- 4003-561 Programming Skills**  
The goal of this course is to introduce students to a programming paradigm and an appropriate programming language chosen from those that are currently important in industry or that show high promise of becoming important. A significant portion of the learning curve occurs through programming assignments with exemplary solutions discussed later in class. The instructor will post specifics prior to registration. With the approval of the program coordinator, the course can be taken for credit more than once, provided each instance deals with a different paradigm and language. (4003-233 or 4003-236 or 4003-263 or permission of instructor) **Credit 4**
- 4003-570 Computer Graphics I**  
A study of the hardware and software principles of computer graphics. Topics include an introduction to the basic concepts: 2-D transformations, viewing transformations, display file structure, geometric models, picture structure, interactive and noninteractive techniques, raster graphics fundamentals, 3-D fundamentals, graphics packages and graphics systems. Students will use a standard computer graphics API to reinforce concepts and study fundamental computer graphics algorithms. (Third-year standing in computer science or permission of the instructor) **Class 4, Credit 4**
- 4003-571 Computer Graphics II**  
This course will investigate the theory of computer synthesis. Seminal computer graphics papers will be used to describe the various components of the image synthesis pipeline and explain, just as in photography, how the path of light in a virtual scene can be simulated and used to create photorealistic imagery. This course will emphasize the theory behind various rendering tools and libraries available for image synthesis. The student will put theory into practice via a programming assignment and a capstone project. Topics will include light and color, three-dimensional scene specification, camera models, surface materials and textures, rendering (local, ray tracing, radiosity), procedural shading and modeling, tone reproduction, and advanced rendering techniques. (4003-570 or 4002-502)
- 4003-572 Computer Animation—Algorithms and Techniques**  
This course takes a look at computer animation from a programmer's perspective. It will investigate the theory, algorithms and techniques for describing and programming motion for virtual 3D worlds. Approaches that will be explored include key framing systems; kinematics, motion of articulated figures, procedural and behavioral systems, and the use of motion capture data. This is a programming-oriented course with major deliverables, including the implementation of techniques, presented in lecture as well as a final project concentrating on an area of a student's choice. Students enrolling in this course are expected to have proficiency in the use of at least one 3D API (e.g., OpenGL, DirectX, Java3D). (4003-570 or 4002-501 or permission of the instructor) **Class 4, Credit 4**
- 4003-580 Language Processors**  
This course introduces students to issues in the design of language processors and translators. Topics include lexical, syntactic, and semantic descriptions, analysis tools, and programming techniques, as well as environment-, stack-, and heap-based interpreters and at least the principles of code generation for typical computer architectures. Teams of students will be required to design and implement a small programming language. (4003-450 or permission of the instructor) **Class 4, Credit 4**

**4003-590 Seminar in Computer Science**  
Current advances in computer science. (Bridge course; set by instructor) **Class 1-4, Credit 1-4**

**4003-598 Honors Project**  
The Honors project enables upper-level computer science Honors program students to gain further depth in an area of their choice under the supervision of a computer science faculty member. Project deliverables include a scientific paper and a presentation open to the community. (4003-590) **Credit 2**

**4003-599 Independent Study**  
A supervised investigation of selected topics in computer science. (Consent of the sponsor and departmental approval) **Credit 1-4**

## Medical Informatics

**4006-230 Computers in Medicine**  
This is an introduction to computer technology and its use in the medical field. About half of the course is devoted to the study of computers, their basic components and peripheral devices, the storage and retrieval of data, electronic communications and the Internet. The other half of the course deals with medical data and major applications of computers in medicine, including hospital information systems (HIS), medical imaging, surgery, telemedicine and pharmacy. Through demonstration and computer laboratory assignments, students are exposed to personal productivity software such as word processors, spreadsheet and database systems, presentation software and electronic communications. **Class 3, Lab 2, Credit 4**

**4006-240 Introduction to Medical Informatics**  
This is an introduction to informatics as applied to the medical field. It is a study of the nature of medical information and its use in clinical practice as well as in medical research and education. It is also an examination of the electronic medical record (EMR) and its impact on health care delivery. The Internet and mobile computing are presented as sources of medical information. Health care information systems are discussed as well as their development, selection and implementation. The important roles of computing or informatics specialists in medicine are stressed. The course also includes a thorough discussion of privacy, confidentiality and information security, including health care regulatory and accreditation issues and the Health Insurance Portability and Accountability Act (HIPAA). (4006-230) **Class 3, Lab 0, Credit 3**

**4006-310 Medical Informatics I**  
An in-depth study of the M programming language and its database capabilities includes direct mode, local/global/special variables, commands, arguments, operators, writing and executing routines, M editors, screen/printer formatting, string manipulation, pattern matching, concatenation, arrays and trees, multilevel and string subscripts, input/output using devices, cross-reference files, indirection. Programming projects are required and are taken from the health care field. (4006-230 or permission of instructor) **Class 3, Lab 2, Credit 4**

**4006-345 Medical Informatics Seminar**  
This is an introduction to the use of computers in medical practice, education and research. Every week a different speaker from the medical field gives a presentation. Students also receive information concerning career opportunities and cooperative education. **Class 1, Lab 0, Credit 1**

**4006-410 Medical Informatics II**  
This is an in-depth study of the acquisition, storage and use of information in the electronic medical record (EMR). Students will learn about the types of information used in clinical care: text, structured data, images and sounds. Other topics include: clinical vocabularies (existing schemes and their limitations); how clinical information is generated and utilized; methods of information storage and retrieval; departmental systems (laboratory, radiology and hospital information systems); organizational systems (including scheduling, registration and financial systems); and the legal, social and regulatory problems of EMRs, including security and confidentiality. In addition, students will work with the CACHE post-relational database management system. Programming assignments will be required. (4006-310 and 4002-360) **Class 3, Lab 2, Credit 4**

**4006-420 Medical Database Architectures**  
This is an in-depth study of database architecture used in the medical field. Students will learn about the different types of database architectures in support of medical education, clinical research and clinical applications. Database design and programming assignments will be required. (4006-410) **Class 3, Lab 2, Credit 4**

**4006-430 Medical Application Integration**  
This course will provide students with an understanding of application integration in healthcare. Java programming assignments will be required. Students will also learn medical business processes and how they impact data integration within a hospital. Middleware message brokers will be examined along with the use of the HL7 messaging standard. Web services and other forms of data integration will be studied. (4006-410, 4003-233 or 4002-219) **Class 3, Lab 2, Credit 4**

## Software Engineering

**4010-101 Software Engineering Seminar**  
Provides first-year students with the skills necessary to succeed at RIT and in the software engineering program. Small group sessions are used to help new students work in teams, explore fundamental software engineering concepts and become acquainted with departmental facilities and resources. In addition, students are introduced to the profession of software engineering and to the ethical issues they face throughout their careers. **Class 1, Credit 1**

**4010-102 Freshman Honors Seminar**  
This course provides an introduction to the Honors program for all freshman GCCIS Honors students. The course provides an overview of GCCIS, the programs within the college and the requirements for the Honors program at the institute, college and program levels. Honors students will hear discussions of professional research interests from faculty members from all three departments. **Class 2, Credit 0**

**4010-350 Personal Software Engineering**  
This is a project-based course to enhance individual, technical engineering knowledge and skills as preparation for upper-division team-based course work. Topics include adapting to new languages, tools and technologies; developing and analyzing models as a prelude to implementation; software construction concepts (proper documentation, implementing to standards, etc.); unit and integration testing; component-level estimation; and software engineering professionalism. (4003-233, corequisite 1016-314 or equivalent) **Credit 4, Lab 4**

**4010-361 Software Engineering**  
An introductory course in software engineering, emphasizing the organizational aspects of software development and software design and implementation by individuals and small teams within a process/product framework. Topics include the software life cycle, software design, user interface issues, specification and implementation of components, assessing design quality, design reviews and code inspections, software testing, basic support tools, technical communication and system documentation, and team-based development. A term-long team-based project done in a studio format is used to reinforce concepts presented in class. (4003-233) **Class 4, Credit 4**

**4010-362 Engineering of Software Subsystems**  
An introduction to the principles of the foundations of contemporary software design. Topics include software subsystem modeling, design patterns, design tradeoffs and component-based software development, with a focus on application of these concepts to concrete design problems. The relationship between design and related process issues such as testing, estimation and maintenance is also discussed. (4010-361 and either 4010-350 or 4003-334) **Class 4, Credit 4**

**4010-420 Methods of Specification and Design**  
Introduction to the development of mathematical models of software systems and the application of such models to the analysis of system properties and verification of design and implementation decisions. Topics include a brief review of logic and set theory, the use of formalism such as Z or VDM, the development of models using the formalism and analysis via simulation or proof of a model's properties. The application of other formalisms, such as state machines and regular expressions, is also surveyed. (1016-366, 4010-362) **Class 4, Credit 4**

**4010-441 Principles of Concurrent Software Systems**  
Issues and structures common in the construction of concurrent software systems. Emphasis is on fundamentals repeated in the design and development of systems with closely coupled systems concurrently executing components. Topics include modeling, synchronization, and coordination techniques and common architectures for concurrent software systems. Other issues include problem decomposition and analysis of deadlock safety and liveness. (4010-362) **Class 4, Credit 4**

- 4010-442 Principles of Distributed Software Systems**  
Issues and structures common in the construction of distributed software systems. Emphasis is on fundamentals found in systems of this type. Topics include remote object invocation, middle-ware technologies, and common architectural and design patterns. Quality factors will be discussed, including responsiveness, throughput and extensibility. Team projects are done in a studio format to reinforce concepts presented in class. (4010-362) **Class 4, Credit 4**
- 4010-443 Principles of Information Systems Design**  
Issues and structures common in the construction of information systems. Emphasis is on fundamentals repeated in most systems of this type. Topics include historical review of methods of organizing and accessing information, high-level modeling techniques, performance and security concerns, implications of storing new data types (e.g., sound, pictures) and new dimensions (e.g., time) on information systems architectures. Team projects are required. (4010-362) **Class 4, Credit 4**
- 4010-444 Engineering Methods for Software Usability**  
This course introduces quantitative models and techniques of human computer interface analysis, design and evaluation that are relevant to the software engineering approach of software development. Contemporary human computer interaction (HCI) techniques are surveyed, with a focus on when and where they are applicable in the software development process. Students will deliver usable software systems derived from an engineering approach to the application of scientific theory and modeling. Other topics may include: usability evaluation planning, methods of evaluation, data analysis, social and ethical impacts of usability, economic justification, prototyping and tools. (4010-362, 1016-351 or 1016-314) **Class 4, Credit 4**
- 4010-450 Software Process and Product Metrics**  
Software metrics help a software organization on two main fronts: quality assessment of its process and products, and assessment of its progress toward its main goal—the production of software artifacts. Students are exposed to metrics used in industry to control large software processes. Topics include product and process metrics, personal metrics portfolio, metrics attributes, and resource and time estimation metrics and use of metrics in quality engineering. (4010-361) **Class 4, Credit 4**
- 4010-452 Software Verification and Validation**  
Introduction to a set of principles and techniques that represent the foundation for improving software products. Topics include verification and validation, unit level testing, system level testing, software quality assurance and software reliability. Team projects are emphasized. (4010-361) **Class 4, Credit 4**
- 4010-456 Software Engineering Process**  
An introductory course to software process and related software project management issues. Emphasis is on the study, use, evaluation and improvement of the software development process. Topics include software development methodologies, software project planning and tracking, change control, software quality assurance, risk management and software process assessment and improvement. (4010-361) **Class 4, Credit 4**
- 4010-461 Real Time and Embedded Systems**  
This course provides a general introduction to real-time and embedded systems. It will introduce a representative family of micro controllers and require students to program on these devices. Fundamental material on real-time operating systems, such as requirements specification, design patterns, scheduling algorithms and priority inversion avoidance, will be presented. The features of a commercial real-time operating system will be discussed and used for course assignments. (4010-441 or 4003-440) **Class 4, Credit 4**
- 4010-462 Modeling Real-Time Systems**  
This course introduces the modeling of real-time software systems. It takes an engineering approach to the design of these systems by analyzing system models before beginning implementation. UML will be the primary modeling methodology. Non-UML technologies will also be discussed. Implementations of real-time systems will be developed manually from the models and using automated tools to generate the code. (4010-441 or 4003-440) **Class 4, Lab 0, Credit 4**
- 4010-499 Software Engineering Co-op**  
Software engineering co-op work block. One quarter of appropriate paid work experience in industry. (Four quarters of co-op experience are required.) **Credit 0**
- 4010-540 Principles of Software Architecture and Design**  
Examination of the fundamental building blocks and patterns for construction of software items in the context of a sound design process, forming the foundation for subsequent courses in the curriculum's design sequence. The course emphasizes the study and development of software systems that can best be understood in terms of sequential software architectures and their architectural and non-architectural quality attributes. Exercises and projects are completed in studio format. (One term of co-op and 4010-441 or one design course) **Class 4, Credit 4**
- 4010-549 Seminar in Software Engineering Design**  
Emerging topics of relevance in software engineering design. (4010-362) **Credit 1–4**
- 4010-555 Software Requirements and Specification**  
In-depth coverage of the early phases of the software development life cycle commonly called software requirements analysis and specification. Topics include requirements elicitation, analysis and definition, requirements prototyping, functional and nonfunctional requirements specification. Team projects are emphasized. (One term of co-op and one process course) **Class 4, Credit 4**
- 4010-559 Seminar in Software Engineering Process**  
Emerging topics of relevance in software engineering process. (4010-361) **Credit 1–4**
- 4010-561 Software Engineering Project I**  
The first course in a two-course, senior-level, capstone project experience. Students work as part of a team to develop solutions to problems posed by either internal or external customers. Problems may require considerable software development or evolution and maintenance of existing software products. Culminates with the completion and presentation of the first major increment of the project solution. (Fifth-year standing in software engineering, 4 quarters of co-op, 4010-444, 4010-555, and 4010-540).
- 4010-562 Software Engineering Project II**  
This is the second course in a two-course, senior-level capstone project experience. Students submit one or more additional increments that build upon the solution submitted at the end of the first course. Students make major presentations for both customers as well as technical-oriented audiences, turn over a complete portfolio of project-related artifacts and offer an evaluation of the project and team experience. (4010-561) **Class 4, Credit 4**
- 4010-590 Software Engineering Seminar**  
Emerging topics of relevance to the software engineering field. **Class 1–4, Credit 1–4 (set by instructor)**
- 4010-598 Honors Independent Study**  
The Honors student will work independently under the supervision of a faculty adviser on a topic not covered in other courses. (4010-362, 1 term of co-op)
- 4010-599 Independent Study**  
The student will work independently under the supervision of a faculty adviser on a topic not covered in other courses (proposal signed by a faculty member) **Class 1–4, Credit 1–4 (set by instructor)**

## Networking, Security, and Systems Administration

- 4050-201 Freshman Seminar**  
This course is a small group seminar for first-year students in the department of networking, security, and systems administration. Students are exposed to the skills necessary to be successful at RIT and in the applied networking and systems administration program as well as the information security and forensics program. These small group sessions are used to help new students form peer relationships as well as create a bond with the faculty, their program and with RIT. Through the use of guest speakers and topical discussions of current issues, students will be introduced to the ethical issues they will face at RIT and throughout their career. Students will be introduced to the basics of project management using their course work as the project to be managed. Students will also gain a better understanding of the resources and facilities available to them at RIT and in the Golisano College and the department of networking, security and systems administration. **Class 2, Credit 2**

**4050-210** **Small and Home Office Networking Essentials**  
This course will teach students how to determine what computer and network equipment is appropriate for use in a home or small office network. Students will learn the basic configurations for a home/small office network and explore in a lab environment the different hardware and software tools and configurations required to establish a personal local area network. **Class 3, Lab 2, Credit 4**

**4050-212** **Platform-Independent Client Server Programming**  
Advanced application programming with a network-centric nature will be explored. Topics covered will include threads, simple thread synchronization, TCP-based client-server programming, and file access and sharing. The use of pointers and pointer manipulation will be addressed throughout. Programming projects will be required. (4002-210; corequisite 4050-351) **Class 5, Credit 4**

**4050-220** **Cyber Self-Defense**  
This course will teach students how to recognize a potential cyber attacker and identify their own vulnerabilities so that they can defend themselves, their information and their identity. Students will be introduced to the tools and techniques to defend against, react to and recover from a cyber attack. **Class 3, Credit 3**

**4050-221** **Cyber Self-Defense Lab**  
Students will gain a hands-on perspective on topics covered in 4050-220, Cyber Security Defense lecture. In a lab environment, students will explore virtual private network (VPN) client configuration, personal firewalls, virus checking software, and ad ware and spy ware software configuration. (Corequisite 4050-220) **Lab 2, Credit 1**

**4050-350** **Computer System Fundamentals**  
The course is organized around goals and activities involving computer technology familiar to most students. The examples used to illustrate topics build progressively on each other and bring the student from the basics of the PC's physical construction through the complexities of the operating system. (1016-205) **Class 3, Lab 2, Credit 4**

**4050-351** **Network Fundamentals**  
Network technologies and standards are discussed with in-depth coverage of layers 1, 2, and 3. Topics include, but are not limited to, access control, framing, operation of layer 2 protocols including wired and wireless technologies, network protocols (IPv4, IPv6 and IPX), transport protocols (TCP, UDP and SPX), network security, subnetting, and network hardware. (4050-350) **Class 3, Lab 2, Credit 4**

**4050-360** **Information Security Policies**  
With the increased use of computer and network systems comes the increased potential for security violations. Organizations need to be prepared to handle these violations and employees need to be informed of acceptable use, both through preparation and incident response. In this course, students will study the need for information security policies, procedures and standards. Students will write security policies. Other topics include, but are not limited to, trust models, security policy design and incident response. (4050-220) **Class 4, Credit 4**

**4050-365** **Cryptography and Authentication**  
As more users access remote systems, the job of identifying and authenticating those users at a distance becomes increasingly difficult. The growing impact of attackers on identification and authentication systems puts additional strain on our ability to insure that only authorized users obtain access to controlled or critical resources. This course introduces encryption techniques and their application to contemporary authentication methods. (4050-220 and 1016-206) **Class 4, Credit 4**

**4050-402** **OS Scripting**  
This course is a survey of tools and techniques used to script common tasks in operating system environments. It will focus on Unix shell script programming. Students will gain experience in writing scripts for Unix and will be challenged to bend traditional programming paradigms to the writing of effective scripts in the OS environment. Programming projects will be required. (4002-218 or equivalent and 1016-206) **Class 5, Credit 4**

**4050-403** **Concepts of Wireless Data Networking**  
This course is designed to provide the student with an understanding of the principles and concepts of radio and optical communication as they apply to wireless data networking for local area networks and peripherals. Included in the course will be an examination of modulation techniques, measurement standards, nomenclature, equipment and theory behind transmissions in this portion of the electromagnetic spectrum. (4050-342 or 4050-351) **Class 4, Credit 4**

**4050-413** **Applications of Wireless Data Networking**  
This course explores wireless data networking technologies and equipment. As its basis it uses the fundamental concepts and technologies learned in -342 and -403 and expands on them to include other contemporary and emerging technologies. In this course we will discuss topics such as wireless local area networks (WLANs), wireless network operation, network integration, construction and network design. (4050-342 or 351, 4050-403; corequisite 4050-413 lab) **Class 3, Lab 2, Credit 4**

**4050-421** **Systems Administration I**  
This course is designed to provide students with essential knowledge and skills in system administration. Basic operating system concepts, such as file systems, processes and threads, memory management and input/output are covered to provide students with an understanding of the fundamentals of a computer system. Services including remote procedure call (RPC), network file system (NFS), network information service (NIS), server message block (SMB), and services for Unix (SFU) are introduced. (4050-402 and either 4050-351 or 4050-342) **Class 3, Lab 2, Credit 4**

**4050-422** **Systems Administration II**  
System administration topics focused on platform integration, the active directory, authentication and user support services are explored. Topics will include security issues, user and group administration, directory services, electronic system update and maintenance, backup and restoration strategies and techniques, integrated mass storage technologies and alternative client technologies. (4050-421 and 4050-516; corequisite 4050-422 lab) **Class 3, Lab 2, Credit 4**

**4050-423** **Systems Administration III**  
The provision and management of information technology services in an enterprise environment involves a high degree of complexity due to issues of scale and heterogeneity. This course is designed to enhance students' understanding of these issues by building an enterprise context around selected technologies. Students will explore the technologies available to provide computing services in enterprise-scale environments, including virtualization of services, computing grids and clusters. Students will also discuss issues related to the role of information technology in large organizations and the facilitation of that role by system administrators through the use of policies and procedures, project planning, budgeting and financial analysis, disaster planning and incident response. (4050 422; corequisite 4050-423 lab) **Class 3, Lab 2, Credit 4**

**4050-460** **Introduction to Computer Malware**  
Computer malware is a computer program with malicious intent. In this course, students will study the history of computer malware, categorizations of malware such as computer viruses, worms, Trojan horses, spyware, etc. Other topics include, but are not limited to, basic structures and functions of malware, malware delivery mechanism, propagation models, anti-malware software, its methods and applications. Students will write an anti-virus program. (4050-220, 4002-218 or 4002-221, 4050-351). **Class 4, Credit 4**

**4050-495** **Honors Capstone Project**  
The student will work independently under the supervision of a faculty adviser on a topic not covered in other course work. (Completion of all institute Honors academic requirements) (May be split across two consecutive quarters) **Credit 4**

**4050-499** **Co-op in NSSA**  
Students will gain experience and a better understanding of the application of technologies discussed in classes by working in the field of networking, security, or system administration. Students will be evaluated by their employer. (Third-year status in the program. If a transfer student, one quarter in residence must be completed at RIT carrying a full academic load.)

**4050-515** **Introduction to Routing and Switching**  
This is a laboratory-based course that focuses on the standards and technologies used to establish inter-network structures that will support a transmission control protocol/Internet protocol (TCP/IP) data stream for higher level services to operate over. It is primarily concerned with the network layer and below. Although the course focuses on the TCP/IP protocol suite and Ethernet LAN protocol, other protocols may be studied. Students will use their knowledge of how to connect computers (PCs) in a local area network (LAN) and learn how to connect separate networks to form an Internet. Bridging and switching concepts are investigated (such as the resolution of bridging loops through the appropriate algorithms). Routed and routing protocols and algorithms are studied and implemented. (4050-342 or 4050-351) **Class 3, Lab 2, Credit 4**

**4050-516** **Network Services**  
An investigation of the tasks of selecting, configuring and administering services in an Internetworking environment. Topics include the TCP/IP protocol suite, service administration including DHCP, DNS, SSH, and Kerberos LDAP and NetBIOS/WINS. Students completing this course will have experience in administering an Internetwork of computers with a variety of these services as well as an understanding of the similarities and differences between protocols in the TCP/IP suite (TCP and UDP). (4050-402 and either 4050-342 or 4050-351) **Class 3, Lab 2, Credit 4**

**4050-517** **Network Forensics and Security**  
This course investigates the many facets of network security and forensics. Students will examine the areas of intrusion detection, evidence collection, network auditing, network security policy design and implementation as well as preparation for and defense against attacks. The issues and facilities available to both the intruder and data network administrator will be examined and evaluated with appropriate laboratory exercises to illustrate their effect. (Offered Winter and Spring quarters) (4050-515 and 4050-516 and either 0501-507 or 4002-415 or equivalent; corequisite 4050-517 Lab) **Class 3, Lab 2, Credit 4**

**4050-519** **Network Troubleshooting**  
Network administration involves many aspects other than building, configuring and managing networks. The ability to quickly diagnose and solve network problems is essential to any functional network as is the ability to employ the proper diagnostic tools to predict possible problem areas before network interruptions can disrupt critical transactions. As organizational dependency on network data transactions continues to grow, networks have expanded to meet this need. The complexity of networks tends to grow exponentially with the size of the networks. The ability to cope with this complexity requires keen problem-solving skills as well as the ability to utilize available tools. This course is designed to teach problem-solving skills, the employment of the available tools and a teamwork (as well as an individual) approach to solving problems with both reactive and proactive approaches in complex networks. (4050-413 and 4050-515; corequisite 4050-519 lab) **Class 3, Lab 2, Credit 4**

**4050-520** **Advanced Switching for Data Communication**  
This course is designed to provide students with the expertise to optimize network performance and security through the use of switches. Topics will include spanning tree algorithms, virtual local area network (VLAN) tagging, trunk ports, port aggregation, queuing, Layer 3, Layer 4 and Layer 5 switching, multiprotocol label switching (MPLS), and optical switching. (4050-515) **Class 3, Lab 2, Credit 4**

**4050-521** **Perl for System Administration**  
This course will provide students with an introduction to the Perl programming language, with examples and problems drawn from the system administration arena. After covering the essentials of the language, students will be taught how to create Perl objects and install modules for use on a computing system. Application areas for Perl scripts will include file system walking programs, user account creation and manipulation and the processing of log files. (A two-course object-oriented programming sequence) **Class 5, Credit 4**

**4050-522** **Introduction to Network Programming**  
Programming techniques for sending information over a network will be explored. All programming will be above the transport layer, employing one of the ICMP, UDP or TCP protocols. Multi-threaded servers will be examined. Principles of good protocol design will be studied. In addition, students will be required to program to establish standard protocols. (4050-515 and 4002-318 or 4002-219 or equivalent) **Class 5, Credit 4**

**4050-523** **Security of Wireless Data Networks**  
This course is designed to provide the student with an understanding of the principles and concepts of wireless data network security. Topics include mechanisms for securing wireless data networks, including physical layer techniques, filters, applications and encryption. (4050-413; corequisite 4050-523 lab) **Class 3, Lab 2, Credit 4**

**4050-530** **Telephony Integration**  
Students taking this course will gain experience on both traditional and next generation Internet protocol (IP) telephony systems. Students will explore the issues associated with migrating to newer systems and implement their own IP-based data networks. These networks will be designed to carry real-time data, including IP telephony. (4050-515) **Class 3, Lab 2, Credit 4**

**4050-540** **Network Design and Performance**  
This capstone course will examine the design and performance of networks. Students will learn to design networks based on identified needs and analyze the performance of that network. The designs include site, campus and enterprise. WAN technologies will be combined with LAN technologies in the design of enterprise networks. Students will learn to assess the business goals and their application to the network goals. Students will learn to evaluate the security goals of the network and to integrate these goals in the design. (4050-421, 4002-455, 4050-515, 4050-516) **Class 4, Credit 4**

**4050-545** **Advanced Routing**  
This course in advanced networking topics explores in depth the technologies available to large enterprises to build a large intranet infrastructure. The topology of the Internet is discussed, along with current and emerging technologies for the implementation of that backbone. Topics include core routers and routing protocols, queuing, multicast routing and the MBONE, variable length subnet masking, IP address depletion and network address translation, enterprise-wide backbone routers, and emerging protocols. (4050-515) **Class 3, Lab 2, Credit 4**

**4050-550** **Emerging Network Applications**  
This course will discuss the changing nature of communication, the requirements of emerging applications, the effect on network design and the security concerns associated with them. The focus is on the evolution of multimedia services (such as voice and video) and Internetworking technologies in supporting convergence. While examining upcoming technologies and future trends that will impact the direction of IP and broadband technology development, of primary concern will be standards, protocols, deployment and emerging technologies involved in the voice over IP and video over IP systems. (4050-530) **Class 3, Lab 2, Credit 4**

**4050-580** **Computer System Security**  
This course proposes to increase the understanding of the student in the areas of liability, exposure, opportunity, ability and function of various weaknesses and forms of attack and the detection and defense of the same. The issues and facilities available to both the intruder and administrator will be examined and evaluated with appropriate laboratory exercises to illustrate their effect. (4050-421 and either 0501-507 or 4002-415 or equivalent; corequisite 4050-580 Lab) **Class 3, Lab 2, Credits 4**

**4050-581** **Computer System Forensics**  
An investigation of the tasks of incident response and computer system forensics. Students will learn the basic procedure of incident response as well as tools needed to uncover activities of computer users (deleted and hidden files, cryptographic steganography, illegal software, etc). Students will also learn to employ the activities needed to gather and preserve this evidence to ensure admissibility in court. (4050-421; corequisite 4050-581 lab) **Class 3, Lab 2, Credit 4**

**4050-582** **Wireless Ad Hoc Sensor Networks**  
This course will introduce students to the diverse literature on ad hoc sensor networks, and expose them to the fundamental issues in designing and analyzing ad hoc sensor network systems. Students will study related technologies and standards ranging from networking, OS support and algorithms to security. Of primary concern will be protocol design, communication and computational challenges posed by these systems. Students will construct ad hoc sensor networks, program on the sensor hardware and study the performance of various protocols. (4050-342 or 4050-351 plus 4002-219 or 4050 212 or consent of instructor; corequisite 4050-582 lab) **Class 3, Lab 2, Credit 4**

**4050-585** **Networks and Systems Security Audit**  
This course will provide students with an introduction to the processes and procedures for performing a technical security audit of systems and networks. Students will explore available auditing techniques and apply appropriate tools to audit hosts, servers and network infrastructure components. In addition, students will write and present their audit reports on vulnerability analysis. (4050-580 and 4050-515) **Class 3, Lab 2, Credit 4**

**4050-590** **Seminar in Advanced Lab Topics**  
Current topics and advances in applications of computer technology for undergraduate students. (Permission of instructor and third-year standing) **Class 4, Lab 0, Credit 4**

**4050-599** **Independent Study in NSSA**  
Students will work with a supervising faculty member on a project of mutual interest. Project design and evaluation will be determined through discussion with the supervising faculty member and documented through completion of an independent study form to be filed with the NSSA department. **Credit variable**

# Kate Gleason College of Engineering

## Index

0301	Electrical Engineering	46
0302	General Engineering	49
0303	Industrial and Systems Engineering	50
0304	Mechanical Engineering	51
0305	Microelectronic Engineering	55
0306	Computer Engineering	56
0307	Applied Statistics	58

*Course numbering: RIT courses are generally referred to by their seven-digit registration number. The first two digits refer to the college offering the course. The third and fourth digits identify the discipline within the college. The final three digits are unique to each course and identify whether the course is noncredit (less than 099), lower division (100–399), upper division (400–699), or graduate level (700 and above).*

*Unless otherwise noted, the following courses are offered annually. Specific times and dates can be found in each quarter's schedule of courses, published by the Office of the Registrar. Prerequisites/corequisites are noted in parentheses near the end of the course description.*

## Electrical Engineering

**0301-205 Electrical Engineering Freshman Practicum**  
Introduction to the practice of electrical engineering, including understanding laboratory practice, identifying electronic components, operating generic electronic instruments, building an electronic circuit (Wein Bridge oscillator), measuring and capturing an electronic waveform, schematic entry, modeling and simulation of an electronic circuit (SPICE or equivalent), analyzing a waveform using a commercial software package (MATLAB), and emulating an electronic instrument in software (C programming). This studio lab course emphasizes a learn-by-doing approach to introduce the student to electrical engineering design practices and tools used throughout the undergraduate program. Each student will prototype and build a functioning electronic circuit. **Lab 3, Credit 1 (F, W)**

**0301-240 Digital Systems**  
This course introduces students to the basic components used in digital systems and is usually the student's first exposure to engineering design. The laboratory component consists of small design projects that must be constructed and validated by the student. The projects run from traditional combinational logic using SSI chips to small subsystem implementation in a programmable device. **Class 3, Lab 2, Credit 4 (F, W, S)**

**0301-305 Electrical Engineering Sophomore Practicum**  
The practice of electrical engineering, including understanding laboratory procedures, identifying electronic components, operating generic electronic instruments, building an electronic circuit (infrared transceiver), measuring and capturing an electronic waveform, schematic entry, modeling, and simulation of an electronic circuit (PSPICE or equivalent), and analyzing a waveform using a commercial software package (MATLAB). This studio style lab course emphasizes a learn-by-doing approach to introduce the student to electrical engineering design practices and tools used throughout the undergraduate academic program and professional career. Each student will analyze, prototype, build and test a functioning electronic circuit using surface mount technology. All laboratory work will be recorded in a laboratory notebook. **Lab 3, Credit 1 (W, S)**

**0301-346 Advanced Programming for Engineers**  
This course teaches students to master C++ programming in solving engineering problems and introduces students to basic concepts of object-oriented programming. Advanced skills of applying pointers will be emphasized throughout the course so as to improve the portability and efficiency of the programs. Advanced skills of preprocessors, generic functions, linked list and the use of standard template library will be developed. (4001-211 or equivalent) **Class 4, Credit 4 (F)**

**0301-347 Computer Architecture**  
The purpose of this course is to expose students to both the hardware and the software components of a digital computer system. It focuses on the boundary between hardware and software operations. Students will learn about a computer system from various abstraction levels from the digital logic gates to software applications. This course will also provide a solid foundation in computer systems architecture. The first half of the course should deal with the major hardware components such as the central processing unit, the system memory and I/O modules. The second half focuses on instruction set architectures. The lab sessions cover hardware description language (HDL) implementations of the hardware functional blocks presented in lectures. (0301-240, 365, 4001-211) **Class 3, Lab 2, Credit 4 (F, W)**

**0301-360 Introduction to Semiconductor Devices**  
An introductory course on the fundamentals of semiconductor physics and principles of operation of basic devices for beginning electrical engineering students. Topics include semiconductor fundamentals (statistical physics of carrier concentration, motion in crystals, energy band models, drift and diffusion currents) as well as the operation of p-n junction diodes, bipolar junction transistors (BJT), metal-oxide-semiconductor (MOS) capacitors and MOS-field-effect transistors (MOSFET). (1017-313, 1016-305) **Class 4, Credit 4 (W, S)**

**0301-365 Microcomputer Systems**  
Initial course in microprocessor-based systems. After a review of computer arithmetic, logic operations, number systems and codes, the elements of microcomputer architecture are presented, including a detailed discussion of the memory, input-output, the central processing unit (CPU) and the buses over which they communicate. Assembly-language-level programming is introduced with an emphasis on enabling manipulation of elements of a microcomputer system. Efficient methods for designing and developing assembly language programs are presented. Concepts of program controlled input and output are studied in detail and reinforced with extensive hands-on lab exercises involving both software and hardware. (0301-240, 4001-211) **Class 4, Lab 3, Credit 4 (S)**

**0301-370 Nanoscience Engineering and Technology**  
In this course fundamentals of nanoscience and engineering are covered. Distinct physical and chemical phenomena at the nanoscale are examined. These phenomena can be uniquely utilized in nano-scale devices and systems. This course emphasizes molecular electronics, nanoelectronics and nanobiosystems. Organic and inorganic nanomaterials, as well as nanofabrication technologies, are studied. Computational nanotechnology and nano-CAD are covered in order to perform heterogeneous simulation and data-intensive analysis. This course introduces ethics, social issues, economic impact, leadership and entrepreneurship topics. The proposed course integrates vital components of nanoscale science and engineering in a unified interdisciplinary nanotechnology setting. (1016-305, 1017-313) **Class 4 Credit 4 (S)**

**0301-381 Circuits I with Lab**  
Covers basics of DC circuit analysis starting with the definition of voltage, current, resistance, power and energy. Linearity and super position, together with Kirchoff's laws, are applied to analysis of circuits having series, parallel and other combinations of circuit elements. Thevenin, Norton and maximum power transfer theorems are proved and applied. Inductance and capacitance are introduced and the transient response of RL, RC and RLC circuits to step inputs is established. Practical aspects of the properties of passive devices and batteries are discussed, as are the characteristics associated with battery-powered circuitry. The laboratory incorporates use of computer and manually controlled instrumentation, including power supplies, signal generators and oscilloscopes to reinforce concepts discussed in class as well as circuit design and simulation software. (0301-205, 1017-313, 1016-305) **Class 4, Lab 1, Credit 4 (F, W, S, SU)**

**0301-382 Circuits II**  
Covers the fundamentals of AC circuit analysis starting with the study of sinusoidal steady-state solutions for circuits in the time domain. The complex plane is introduced along with the concepts of complex exponential functions, phasors, impedances and admittances. Nodal, loop and mesh methods of analysis as well as Thevenin and related theorems are applied to the complex plane. The concept of complex power is developed. Two-port network theory is developed and applied circuits and interconnections. The analysis of mutual induction as applied to coupled coils, linear ideal and non-ideal transformers is introduced. Complex frequency analysis is introduced to enable discussion of transfer functions, frequency dependent behavior, magnitude vs. frequency and phase angle vs. frequency plots, resonance phenomenon and simple filter circuits. (0301-381) **Class 4, Credit 4 (F, W, S, SU)**

**0301-453** **Linear Systems I**  
Linear Systems I provides the foundations of continuous and discrete signal and system analysis, including signal and system description and modeling. Topics include: a description of continuous linear systems via differential equations; a description of discrete systems via difference equations; input-output relationship of continuous and discrete linear systems; the continuous time convolution integral; the discrete time convolution sum; application of convolution principles to system response calculations; exponential and trigonometric forms of Fourier series and their properties; Fourier transforms, including energy spectrum and energy spectral density. (0301-382, 1016-328, 420) **Class 4, Credit 4 (F, W)**

**0301-473** **Electromagnetic Fields I**  
Study of electrostatic, magnetostatic and quasi-static fields. Topics: review of vector algebra, vector calculus and orthogonal coordinate systems (Cartesian, cylindrical and spherical coordinates), electrostatic fields (Coulomb's law, Gauss's law, the electrical potential, conductors and dielectrics in static electric fields, polarization, electric flux density and dielectric constant, boundary conditions, capacitance, electrostatic energy forces), solution of electrostatic problems, Poisson's and Laplace's equations, methods of images, steady electric currents, conduction current density and resistance, static magnetic fields (Ampere's law, the vector magnetic potential, Biot-Savart law, the magnetic dipole, magnetization, magnetic field intensity, permeability, boundary conditions, self- and mutual inductance, magnetic energy and forces, Faraday's law of electromagnetic induction). (1016-328, 1017-313) **Class 4, Credit 4 (F, W)**

**0301-474** **Electromagnetic Fields II**  
Study of propagation, reflection and transmissions of electromagnetic waves in unbounded regions and in guiding structures. Topics: time varying fields, Maxwell's equations, wave equations, uniform plane waves in conductive regions, polarization, the Poynting theorem and power, reflection and transmission at normal incidence from plane boundaries (multiple dielectric interfaces), oblique incidence at plane dielectric boundaries, two-conductor transmission lines (transmission line equations, transients on transmission lines, pulse and step excitations, reflection diagrams, sinusoidal steady state solutions, standing waves, the Smith Chart and impedance matching techniques), TE and TM waves in rectangular waveguides (propagation dispersion characteristics). A few experiments illustrating fundamental wave propagation and reflection concepts are conducted. (0301-473) **Class 4, Lab 2, Credit 5 (S, SU)**

**0301-481** **Electronics I with Lab**  
Introduction to electronics and basic principles of small-signal analysis of circuits with diodes and BJTs. The p-n junction is introduced, followed by a study of bipolar junction transistor function. Primarily concerned with such fundamental semiconductor devices as circuit elements, dwelling principally on diode applications and simple BJT. Study includes rectification and power supply filtering and the basic operation and biasing of bipolar junction as well as transistors. Biasing in integrated BJT circuits using current mirrors, differential amplifiers and output stages is studied. Analytical techniques: development of linear equivalent circuits, load line construction, small-signal analysis of single amplifier stages, and multiple amplifier stages. Emphasis on skills required for circuit design. Lab deals with basic design experiments in electronics. (0301-381) **Class 4, Lab 3, Credit 4 (F, W)**

**0301-482** **Electronics II with Lab**  
This is the second course in a two-course sequence in analog electronics design. The course covers the following six topics: basic MOSFET current-voltage characteristics; DC biasing of MOS circuits, including integrated-circuit current sources/mirrors; small-signal analysis of single-stage MOS amplifiers; multistage MOS amplifiers such as differential amplifiers, cascade amplifiers, and operational amplifiers; frequency response of single and multistage amplifiers; and feedback and stability in multistage amplifiers. (0301-382, 481) **Class 3, Lab 3, Credit 4 (S, SU)**

**0301-514** **Control Systems Design**  
First course in the design of feedback control systems. Conventional design techniques, root locus and Bode plots are used to design both continuous and discrete controllers. Topics: review of transfer function models of physical systems, second-order system response and transient specifications, its relationship to complex poles in S and Z planes (Laplace and Z transforms), effect of additional poles and zeros, steady-state error, error constants, root locus analysis, design of lag, lead and PID controllers (continuous and discrete), design using frequency response techniques, review of Bode plots, W transform and Bode plots for discrete systems, specifications in discrete controllers using Bode plots, comparison of continuous and discrete controllers, and practical aspects in controller implementations. MATLAB used in class assignments and lab. (0301-453, 554) **Class 4, Lab 3, Credit 5 (S, SU)**

**0301-531** **Mechatronics**  
Fundamental principles of electric machines are covered. Sensors and actuators are studied. The primary actuators discussed are high-performance electromechanical motion devices such as permanent-magnet DC, synchronous and stepper motors. Topics in power electronics and control of electromechanical systems are studied. High-performance MATLAB environment is used to simulate, analyze and control mechatronic systems. Application of digital signal processors and microcontrollers in mechatronics are introduced. Case studies are covered. (0301-554, 474) **Class 3, Lab 1 Credit 4 (F, W)**

**0301-534** **Communication Systems**  
This introductory course provides the basics of the formation, transmission and reception of information over communication channels. Spectral density and correlation descriptions, for deterministic and stationary random signals. Amplitude and angle modulation methods (e.g. AM and FM) for continuous signals. Carrier detection and synchronization. Phase-locked loop and its application. Introduction to digital communication. Binary ASK, FSK and PSK. Noise effects. Optimum detection: matched filters, maximum-likelihood reception. Computer simulation. (1016-314, 0301-453) **Class 5, Credit 5 (S, SU)**

**0301-545** **Digital Electronics**  
This course covers the essential concepts and applications of digital electronics circuits, including NMOS, CMOS and BiCMOS technologies. After a basic review of MOSFET devices, NMOS and CMOS inverters are studied from both static and dynamic points of view. Design of combinational and sequential logic networks using NMOS and CMOS technologies is discussed. Dynamic CMOS logic networks, including precharge-evaluate, domino and transmission gate techniques are studied. The discussion of TTL NAND and ECL gates is included for historical reasons. Several special topics are studied as extensions of the foregoing topics, including static and dynamic MOS memory, low-power logic, and BiCMOS inverters and logic. (0301-240, 481, 482) **Class 3, Lab 3, Credit 4 (F, W)**

**0301-554** **Linear Systems II**  
Linear Systems II covers advanced topics in both continuous and discrete time linear systems, including the sampling of continuous time signals and the sampling theorem. A comprehensive study of the Laplace transform and its inverse, the solution of differential equations and circuit analysis problems using Laplace transforms, transfer functions of physical systems, block diagram algebra and transfer function realization are also covered. A comprehensive study of the z transform and its inverse, which includes system transfer function concepts, system frequency response and its interpretation, and the relationship of the z transform to the Fourier and Laplace transform is also covered as well as an introduction to the design of digital filters, which includes filter block diagrams for finite impulse response (FIR) and infinite impulse response (IIR) filters. (0301-453) **Class 4, Credit 4 (S, SU)**

**0301-590** **Thesis**  
A research or development project to be carried out under the general supervision of a faculty member. The project need not be state-of-the-art but a reasonable problem of theoretical and/or experimental investigation. To be arranged with an individual faculty member. **Credit 4**

**0301-599** **Independent Study**  
A supervised investigation within an electrical engineering area of student interest. (Permission of instructor) **Class variable, Credit variable 1-4**

**0301-601** **Modern Optics for Engineers**  
This course provides a broad overview of modern optics in preparation for more advanced courses in the rapidly developing fields of lasers, fiber optics and non-linear optics. Topics covered: propagation of light, geometrical optics, polarization, interferometry, diffraction, laser resonators, and introduction to non-linear optics (harmonic generation, optical parametric oscillators and amplifiers). At the end of the quarter, the students should have a firm foundation in classical optics. Lasers and non-linear optics will be introduced from a semi-classical perspective and will not require a quantum mechanical background. Students will write a paper on a topic of current research interest in the field. (0301-474) **Class 4, Credit 4**

**0301-610** **Analog Electronic Design**  
Enhances the student's skills in designing analog circuits. Subjects covered include non-ideal characteristics of op-amps, op-amp applications, A/D and D/A conversion, multipliers and modulators, phase-locked loop, frequency synthesis and audio power amplifiers. Students meet in the classroom three hours each week and three hours in the laboratory. The laboratory time is used to discuss and troubleshoot circuits. Students are expected to work on design projects at their own pace outside of class hours. (0301-481, 482) **Class 3, Lab 3, Credit 4**

**0301-612** **Advanced Semiconductor Devices**  
Continuation of an undergraduate professional elective sequence in semiconductor device physics. Coverage of four major topics: bipolar junction transistor (BJT) fundamentals, including carrier injection, current gain, modes of operation, Ebers-Moll model; BJT advanced topics, including Early effect, high-level injection, Kirk effect, charge-control model, and small-signal models; MOSFET transistor fundamentals, including charge-control analysis, current-voltage characteristics, threshold voltage, and CMOS; and MOSFET advanced topics, including channel-length modulation, sub threshold current, velocity saturation, scaled MOS devices, drain-induced barrier lowering (DIBL), hot carrier effects and scaling issues. (0301-360) **Class 4, Credit 4 (W)**

**0301-615** **State Space Control**  
In this course students are introduced to MIMO systems and their designs using state space techniques. Linear algebra: vectors, linear independent vectors, vector space and null space, rank of a matrix, Eigen values and Eigen vectors, transformation of matrices, functions of matrices, matrix polynomials, Cayley Hamilton theorem state space formulations, canonical forms, controllability and observability, relations between state space and transfer function models, solution of state equations, state space design (pole placement), comparison with conventional design, and introduction to other forms of state space designs. (0301-514) **Class 4, Credit 4**

**0301-621** **Microwave Engineering**  
Studies the theory and design of microwave components and circuits. Reviews basic EM theory; TEM waves in transmission lines; TE and TM waves in rectangular waveguides; microstriplines and striplines; TE and TM waves in cylindrical waveguides; the scattering matrix description of multiport microwave circuits; waveguide tees; directional couplers and phase shifters; microwave integrated circuit components—branchline couplers, power dividers, hybrid ring couplers and phase shifters—rectangular, cylindrical and coaxial cavity resonators; waveguide and coaxial line filters and waveguide frequency meters; microwave integrated circuit high pass and band pass filters; ferrite components. Laboratory illustrates various microwave component design and measurement techniques. **Class 3, Lab 3, Credit 4 (W)**

**0301-630** **Biomedical Instrumentation**  
Study of fundamental principles of electronic instrumentation and design consideration associated with biomedical measurements and monitoring. Topics to be covered include biomedical signals and transducer principles, instrumentation system fundamentals and electrical safety considerations, amplifier circuits and design for analog signal processing and conditioning of physiological voltages and currents as well as basic data conversion and processing technology. Laboratory experiments involving instrumentation circuit design and test will be conducted. (0301-381, 382, 481, 482) **Class 4, Lab 3, Credit 4 (W)**

**0301-631** **Biomedical Sensors and Transducers I**  
Biological entities probably represent one of the most difficult environments in which to obtain or generate accurate and reliable signals. This course will discuss the techniques, mechanisms and methods necessary to transfer accurate and reliable information or signals with a biological target. Various biomedical sensor and transducer types, including their characteristics, advantages, disadvantages and fabrication, will be covered. Discussions will include the challenges associated with providing a reliable and reproducible interface to a biological entity, the nature and characteristics of the associated signals, the types of applicable sensors and transducers and the circuitry necessary to drive them. (0301-381, 382, 481, 482) **Class 4, Lab 3, Credit 4**

**0301-632** **Fundamentals of Electrophysiology**  
Investigation and study of the concepts and underlying mechanisms associated with electrical signals in mammalian biology and physiology with a significant emphasis on methods, techniques and understanding of electrical potential distribution and current flow derived from circuit analysis. Intended to provide engineers with insight into the relationship between the study of electricity and its applicability to a wide variety of physiological mechanisms ranging from intracellular communication and control to cognitive function and bodily movement. Successful completion of the course will require generation of a significant in-depth analysis report on some electrophysiological phenomenon or mechanism. (0301-381, 1026-365) **Class 4, Lab 3, Credit 4 (F)**

**0301-633** **Biomedical Signal Processing**  
Discussion and study of the methods and techniques that may be optimally employed for the fixed and adaptive processing of information with biological and physiological origin. The challenges and unique features of these types of signals will be discussed, and application of known signal processing techniques that accommodate linear, non-linear and stochastic signals for the purpose of analysis, detection and estimation, monitoring and control will be studied. Successful participation in the course will entail completion of at least one project involving incorporation of these techniques in a biomedical application. (Permission of instructor or graduate standing) **Class 4 Credit 4**

**0301-636** **Biorobotics/Cybernetics**  
Cybernetics refers to the science of communication and control theory that is concerned especially with the comparative study of automatic control systems (as in the nervous system and brain and mechanical-electrical communications systems). This course will present material related to the study of cybernetics as well as the aspects of robotics and controls associated with applications of a biological nature. Topics will also include the study of various paradigms and computational methods that can be utilized to achieve the successful integration of robotic mechanisms in a biological setting. Successful participation in the course will entail completion of at least one project involving incorporation of these techniques in a biomedical application. (Permission of instructor or graduate standing) **Class 4, Credit 4**

**0301-637** **Control Systems and Biomedical Applications**  
Application of control system principles associated with input-output analysis, steady state and transient response, feedback concepts, system identification and simulation to the study of physiological processes involved in the regulation and maintenance of homeostasis in a human being. Among areas of interest are coordinated movement, vision, cardiovascular response, fluid management and metabolism. (0301-514 and permission of instructor) **Class 4, Credit 4**

**0301-646** **Power Electronics**  
The study of a variety of semiconductor devices generally used for purposes other than signal processing, including thyristors, unijunction transistors, opto-couplers, power MOS and IGBTs. Applications stressed are concerned with the use of electrical power for control of lighting, motion and heat. Particular attention is given to calculating power dissipation, heat sinks and thermal management. (0301-545) **Class 3, Lab 3, Credit 4**

**0301-647** **Artificial Intelligence Exploration**  
The course will start with the history of artificial intelligence and its development over the years. This course will explore a variety of artificial intelligence techniques and their applications and limitations. Some of the AI techniques to be covered in this course are intelligent agents; problem solving; knowledge and reasoning; uncertainty; decision making; learning (neural networks and Bayesian networks); reinforcement learning; swarm intelligence; genetic algorithms; particle swarm optimization; and applications in robotics, controls and communications. Students are expected to have any of the following programming skills: C/C++, MATLAB, Java or any other high-level programming language. **Class 4, Credit 4**

**0301-650** **Design of Digital Systems**  
Deals with the design of both synchronous and asynchronous digital systems. The accent is on design methodologies for final implementation on programmable logic devices. Design techniques are based on top-down design using ASM charts and bubble diagrams along with microprogramming applications. Students also learn how to rapidly develop digital systems with VHDL. Design strategies for testability are discussed along with their impact on performance. The practical aspects of component interconnection (crosstalk, noise, transmission line effects) with effects on performance are also surveyed. The laboratory portion consists of four distinct projects proposed, designed, simulated (two projects require actual hardware implementation), and tested by the student. The design laboratory is supported by the Altera MAX+PLUS II VHDL design tools and EPLD/FPGA programmers. (0301-240, 365) **Class 4, Lab 3, Credit 4**

**0301-651** **Physical Implementation**  
A technical elective that introduces students to the fundamental principles of application specific IC (ASIC) design. Both circuit design and system design are covered. The student also is introduced to CAD tools for schematic capture, placement and routing of standard cells. The projects are designed and simulated using commercial CAD tools. Top-down design using a hardware description language (VHDL) is included. (0301-650) **Class 4, Credit 4**



**0301-655** **Microcomputer Software I**  
Discussion of the use of the C programming language in generating software specifically for microprocessor-based systems. The tools and procedures necessary for the organized and efficient development of high-level code for a target microprocessor including compilers, linkers, object code libraries, and symbolic debugging as well as monitor programs and real-time multi-tasking kernel principles will be presented. Programming projects with emphasis on the applications in electrical engineering will be assigned. (0301-365) **Class 4, Lab 3, Credit 4**

**0301-662** **Neural Networks**  
"Artificial neural networks" (ANN) is the name given to a broad class of processing algorithms that are loosely based on how the brain processes information. The term "artificial" distinguishes the silicon-based systems from the biological systems (such as ourselves). ANNs are used in numerous applications from manufacturing controls to handwriting recognition to optical visual processing, or in any application that can handle some "fuzziness" in the output. ANNs also form the foundation for artificial intelligence (AI) systems. This course begins with a discussion of what ANNs are and what features define them, then examines a number of the most common neural algorithms and techniques such as backward error propagation ("back-prop"). Software implementations of the algorithms (requiring C programming skills) as well as hardware implementations (requiring PSPICE simulations) will be discussed. **Class 4, Credit 4**

**0301-664** **Embedded Microcontrol Systems**  
Gives the student detailed knowledge of the hardware and software organization of 8-bit microcontroller systems with an emphasis on design. Peripheral interfacing, serial and parallel I/O, including interrupts, are considered. Special attention is given to interfacing microcontroller with the analog world, including the use of A/D and D/A converters. Software organization as well as design tools are discussed. Design case studies of typical microcomputer-embedded systems are examined. (0301-365) **Class 3, Lab 3, Credit 4 (F)**

**0301-677** **Digital Filters and Signal Processing**  
A continuation of the topics studied in 0301-554: study of the design methods for digital IIR filters via s-plane transformations; study of design methods for digital FIR filters, including emphasis on the question of linear phase response; a review of the discrete Fourier transform (DFT); and an in-depth study of fast algorithms (FFTs) for implementing the DFT, including radix 2, radix 4 and mixed radix algorithms; quantization effects in discrete systems; an introduction to digital signal processing computer chips and their use in the implementation of digital processing systems; and applications of digital signal processing, including speech processing and two-dimensional image processing. Includes several design projects in the digital signal processing laboratory. (0301-554) **Class 4, Credit 4**

**0301-679** **Analog Filter Design**  
A study of the various techniques for the design of filters to meet given specifications. Approximations to the ideal filter characteristic through Butterworth, Chebyshev and other polynomials are discussed in detail. The emphasis is on active network realizations using op amp stages. Topics include review of analysis of op amp circuits and transfer function of networks, magnitude and frequency scaling; ideal filter characteristics; Butterworth, Chebyshev and Bessel-Thompson approximations to the ideal filters; determination of transfer functions to meet given specifications, high-pass to low-pass and band-pass to low-pass transformations; standard op amp circuits for filter realizations; negative impedance converters; generalized impedance converters; and switched capacitor filters. (0301-453) **Class 4, Credit 4**

**0301-685** **Principles of Robotics**  
An introduction to a wide range of robotics-related topics, including but not limited to sensors, interface design, robot devices applications, mobile robots, intelligent navigation, task planning, coordinate systems and positioning image processing, digital signal processing applications on robots, and controller circuitry design. Prerequisite for the class is a basic understanding of signals and systems, matrix theory, and computer programming. Software assignments will be given to the students in robotic applications. Students will prepare a project, in which they will complete software or hardware design of an industrial or mobile robot. There will be a two-hour lab in addition to the lectures. (0301-453, 346) **Class 3, Lab 2, Credit 4**

**0301-686** **MEMS Design**  
Microelectromechanical systems (MEMS) are widely used in aerospace, automotive, biotechnology, instrumentation, robotics, manufacturing and other applications. There is a critical need to synthesize and design high-performance MEMS that satisfy the requirements and specifications imposed. Integrated approaches must be applied to design and optimized MEMS, which integrate microelectromechanical motion devices, ICs, and microsensors. This course covers synthesis, design, modeling, simulation, analysis, control and fabrication of MEMS. Synthesis, design and analysis of MEMS will be covered including CAD. (Fourth- or fifth-year standing for undergraduates, or graduate standing) **Class 4, Credit 4**

**0301-688** **MEMS Systems Evaluation**  
This course focuses on evaluation of MEMS, microsystems and microelectromechanical motion devices utilizing MEMS testing and characterization. Evaluations are performed using performance evaluation matrices, comprehensive performance analysis and functionality. Applications of advanced software and hardware in MEMS evaluation will be covered. (Senior standing required) **Class 4, Credit 4**

**0301-692** **Communication Networks**  
A major portion of today's communication takes place over digital networks. This includes communication between people in the form of voice, facsimile (fax) and e-mail as well as communication between machines. Digital networks are most likely to be the dominant element of communication links of the future. The current effort in ISDN points to such a trend. This course covers key aspects of the structure of present-day digital communication networks. (0301-534) **Class 4, Credit 4**

**0301-693** **Digital Data Communication**  
In this course on principles and practices of modern data communication systems, topics include pulse code transmission and error probabilities, M-ary signaling and performance, RF communications link budget analysis, an introduction to channel coding, a discussion of modulation/coding tradeoffs and a discussion of digital telephony. (0301-534) **Class 4, Credit 4**

**0301-697** **Senior Design Project I**  
This is the first half of a two-course capstone design experience that simulates an industrial setting. Teams of students pool their knowledge and experience to attack a specific design problem. Emphasis is on applying contemporary engineering development models that encourage individual and group accountability through team activities that include group problem solving, design activities and communication skills—oral, written and interpersonal. With faculty guidance, teams develop creative and innovative design concepts, then study the feasibility of each concept to arrive at an optimum design. A design report and oral review before peers and faculty are required. Electrical engineering components may include performance specifications, functional flowcharts, ECAD schematics and PCB layouts, test simulation results, software flowcharts and development tools. **Class 4, Open Lab, Credit 4 (F, W, S)**

**0301-698** **Senior Design Project II**  
The sequel to 0301-697, Senior Design Project I. The design created in part I must be constructed, debugged, evaluated and demonstrated against initial specifications. Hardware and software must be integrated to produce a complete working prototype or solution. Design teams manage unforeseen design issues, team issues, schedule, written and oral presentation of the prototype's design and finally a demonstration of its functionality. During the demonstration, the performance specified in the original proposal will be constructed with the special topics related to design. In this second quarter, lectures focus on professional aspects of engineering and special topics related to design and performance of the operational unit. (0301-697) **Class 4, Open Lab, Credit 4 (F, W, S)**

## General Engineering

**0302-210** **Introduction to Engineering**  
A one-credit-hour course for the engineering exploration student that presents information and exercises to introduce the student to the five engineering curricula offered at RIT. Various aspects of the curricula requirements as well as career opportunities that are available are discussed as they pertain to each major. **Class 2, Credit 1 (F)**

**0302-231** **Introduction to Product Development**  
This is the first of six courses that are required of all engineering Honors students. The mission and objectives of the KGCOE Honors program are discussed including the perspectives of more senior honors students. Topics introduced in this course include product development in a global environment, SWOT analysis, creativity, and teamwork. **Credit 0**

**0302-232** **Reverse Engineering**  
Topics included are reverse engineering, design for manufacturing and assembly, and design for safety. Student teams will address these concepts using a toy currently sold on the market. The class will take a field trip to an area toy manufacturer and will see firsthand how product innovation is used by the company. **Class 2, Credit 1 (W)**

**0302-233** **The Design Process**  
Students will learn the steps used in the design process. Topics include team-building, brainstorming, problem definition, creativity, identifying constraints, and establishing design specifications. A weekly portfolio will be completed to document the design process. Students will be assigned to small teams and will be required to solve an open-ended design problem. Teams test their design in a competition that is held at the end of the quarter. **Class 2, Credit 1 (S)**

**0302-234** **Manufacturing and Globalization**  
This course looks at the effects globalization has on U.S. manufacturing. Topics included are supply chain management and logistics, lean manufacturing, outsourcing, corporations and profitability, and the impact of government policies and monetary issues on globalization and outsourcing. **Class 2, Credit 1 (F)**

**0302-235** **Preparation for Honors Domestic Trip**  
This course is for students planning to participate in the domestic trip. Student teams will research the companies they will visit and report back to the class on their findings. Issues to be addressed during the visits will be reviewed. **Class 1, Credit 0 (W)**

**0302-236** **Leadership, Ethics and Sustainability**  
A series of presentations by guest speakers will address the topics of leadership, ethics and sustainability. **Class 2, Credit 1 (S)**

**0302-500** **Study Abroad: INSA Rennes**  
College of Engineering students take classes at National Institute of Applied Sciences in Rennes, France, as part of an exchange program with the Kate Gleason College of Engineering. Department approval required; contact Margaret Anderson at 475-2971 or at mmaeen@rit.edu **Credit variable 1-20**

## Industrial and Systems Engineering

**0303-051** **First-Year Enrichment/Freshman Seminar I**  
Gives first-year students an overview of industrial engineering and helps integrate the incoming students into the RIT ISE community. Topics include student success (e.g., transition to the college experience, awareness of campus resources, academic and personal success strategies, information literacy, personal development and responsible decision making), career options in engineering, plant tours, design projects and engineering ethics. Also gives the student an opportunity to interact with ISE faculty, upper-division students and other first-year ISE students. Fulfills the university requirement for FYE. **Credit 1 (F)**

**0303-052** **First-Year Enrichment/Freshman Seminar II**  
Second in a two-course sequence. Gives first-year students an overview of industrial engineering and helps integrate incoming students into the RIT ISE community. Topics include student success (e.g., transitions to the college experience, awareness of campus resources, academic and personal success strategies, information literacy, personal development and responsible decision making), career options in engineering, plant tours, design projects, life long learning topics, and engineering ethics. Also gives the student an opportunity to interact with ISE faculty, upper-division students and other first-year ISE students. Fulfills the university requirement for FYE. **Credit 1 (W)**

**0303-201** **Fundamentals of Industrial Engineering**  
An introductory course in industrial engineering for first- and second-year students. Describes engineering in an overall sense and industrial engineering in particular. Includes an overview of some of the engineering and contemporary topics used in industrial engineering such as work measurement, manufacturing, facilities planning, engineering economy, statistics, ergonomics and lean manufacturing within the context of the product and process development cycle. The laboratory portion covers hands-on applications relating to topics covered in lectures and group exercises in creative problem solving within the context of engineering design. **Class 3, Lab 1, Credit 4 (F)**

**0303-204** **Computer Tools for Increased Productivity**  
Builds basic computer competence. Students learn about various computer software programs, including computer-aided design (e.g., AutoCAD) and database (e.g., Access) programs. **Class 2, Credit 2 (S)**

**0303-302** **Computing for Engineers**  
A first course in computer programming for engineers. Involves development of programming skills required in the engineering disciplines. C++ is the current language of choice. **Class 4, Credit 4 (F, S)**

**0303-343** **Materials Processing**  
A study of the application of machine tools and fabrication processes to engineering materials in the manufacture of products. Processes covered include cutting, molding, casting, forming, powder metallurgy and welding. Students make a project in the lab portion of the course. **Class 3, Lab 2, Credit 3 (W)**

**0303-401** **Operation Research**  
An introduction to the optimization methodology of mathematical problem formulation. Investigation of mathematical programming techniques, including linear programming and special types of linear programming problems such as the transportation and assignment algorithms. Introduction to integer programming, graph theory and networks. (1016-331 or permission of instructor) **Class 4, Credit 4 (F)**

**0303-402** **Production Control**  
A first course in mathematical modeling of production-inventory systems. Topics include forecasting, aggregate planning, inventory control models and scheduling. (0303-401, 1016-351 or equivalent, or permission of instructor) **Class 4, Credit 4 (F)**

**0303-415** **Ergonomics**  
Physiological and biomechanical aspects of human performance. Principles of physical work and human anthropometry are studied to enable the student to systematically design work places, processes, and systems that are consistent with human capabilities and limitations. Topics include repetitive motion disorders, manual materials handling, hand tool design and selection, and job analysis. (0307-361 or 1016-351 or permission of instructor) **Class 3, Lab 1, Credit 4 (W)**

**0303-422** **Systems and Facilities Planning**  
A basic course in quantitative models on layout, material handling and warehousing. Topics include product/process analysis, flow of materials, material handling systems, warehousing, and layout design. Computer-aided layout design package (e.g., Factory CAD, Flow, Plan) is used. (0303-401 or permission of instructor) **Class 3, Lab 1, Credit 4 (W)**

**0303-481** **Engineering Management**  
Development of the fundamental engineering management principles of industrial enterprise, including an introduction to project management. Internal organization as well as general economic conditions are considered. Business and project planning is also performed. **Class 4, Credit 4 (W, S)**

**0303-483** **Advanced Production Control**  
A design course in production control. Each student is asked to design, test and implement a complete production control system for an operating plant. Professional elective. (0303-402) **Class 4, Credit 4**

**0303-503** **Simulation**  
Queueing theory will be introduced. Modeling and computer simulation of stochastic and dynamic manufacturing and service systems are emphasized. A high-level simulation language (e.g., Arena) will be used to model and examine system performance. (0303-302, 401, 0307-361 or 1016-351 or equivalent) **Class 4, Credit 4 (F)**

**0303-510** **Applied Statistical Quality Control**  
An applied approach to statistical quality control utilizing theoretical tools acquired in other math and statistics courses. Heavy emphasis on understanding and applying statistical analysis methods in real-world situations in engineering. Topics include hypothesis testing and control charts. Contemporary topics such as six sigma are included within the context of the course. (1016-351, 352 or 0307-361, 362) **Class 4, Credit 4 (F)**

**0303-511** **Applied Linear Regression Analysis**  
An applied approach to linear regression analysis utilizing theoretical tools acquired in other math and statistics courses. Heavy emphasis on understanding and applying statistical analysis methods in real-world situations in engineering. Topics include analysis of variance and regression. (1016-331, 0307-361, 362 or 1016-351, 352 or equivalent) **Class 4, Credit 4 (S)**

0303-516

#### Human Factors

Psychological and cognitive aspects of human performance. Human information processing capabilities are studied to enable students to design work places, procedures, products and processes that are consistent with human capabilities and limitations. Topics include the human sensory, memory, attention and cognitive processes; display and control design principles; as well as human computer interface design. (0307-362 or 1016-352 or permission of instructor) **Class 3, Lab 1, Credit 4 (S)**

0303-520

#### Engineering Economy

Time value of money, methods of comparing alternatives, depreciation and depletion, income tax consideration and capital budgeting. Cannot be used as a professional elective for ISE majors. Non-ISE majors may choose this as a professional elective. **Class 4, Credit 4 (E, S)**

0303-526

#### Design and Analysis of Production System

This course will provide an introduction to concepts and techniques in the design and analysis of manufacturing and service systems. A blend of traditional and modern approaches is brought into the classroom. At the end of the quarter, the student will be able to assess and analyze the performance of a given system as well as to provide a framework for system redesign and improvement. Modern aspects such as lean manufacturing are included within the context of the course. (0303-401, 402, or permission of instructor) **Class 3, Lab 1, Credit 4 (S)**

0303-560

#### Multidisciplinary Senior Design I

First course in a two-course design sequence oriented to the solution of real-world engineering problems. Multidisciplinary student teams attempt to define, analyze, design and implement solutions to unstructured, open-ended, multidisciplinary engineering problems. (Fifth-year standing) **Class 4, Credit 4 (E, W)**

0303-561

#### Multidisciplinary Senior Design II

Second course in a two-course design sequence oriented to the solution of real-world engineering problems. Multidisciplinary student teams attempt to define, analyze, design and implement solutions to unstructured, open-ended, multidisciplinary engineering problems. (Fifth-year standing) **Class 4, Credit 4 (W, S)**

0303-599

#### Independent Study

A supervised investigation within an industrial engineering area of student interest. Professional elective. (Permission of instructor) **Class variable, Credit variable**

0303-620

#### Engineering Economy

Time value of money, methods of comparing alternatives, depreciation and depletion, income tax consideration, replacement, retirement and obsolescence, and capital budgeting. Applied project is required. Cannot be used as a professional elective for ISE majors. **Class 4, Credit 4 (E, S)**

0303-630

#### Advanced Systems Integration

Basic concepts and techniques needed to specify, design and implement computer-controlled systems. Real-time data, process control as related to computer-integrated manufacturing. Information systems topics will be introduced within the context of systems integration. (0303-302 or permission of instructor) **Class 3, Lab 1, Credit 4 (W)**

0303-642

#### High-Performance Vehicle Engineering

This course explores the engineering aspects of high-performance vehicle design. Topics include product design specification, systems design, component and systems optimization, manufacturing and assembly, testing and safety. Case studies will be used to introduce students to various aspects of the process. Students will participate in hands-on activities surrounding the design, manufacture, assembly, and testing of high-performance vehicle components. (Fifth-year standing or permission of instructor) **Class 4, Credit 4 (W)**

0303-691

#### Fundamentals of Sustainable Design

The product life cycle is reviewed from various perspectives. Highlights include the leverage over material, process, and environmental costs available at the design phase. Additional project required. **Class 4, Credit 4 (F)**

## Mechanical Engineering

0304-051

#### First-Year Enrichment/Freshman Seminar I

Gives the entering first-year student an overview of mechanical engineering and helps integrate the incoming student into the RIT community. Topics discussed include the program of study, the cooperative work experience, and course advising. In addition, this course gives the student an opportunity to interact with the faculty, upper-division students and other first-year students in a project-oriented environment. Fulfills the university requirement for 1 credit of FYE. **Credit 1 (F)**

0304-052

#### First-Year Enrichment/Freshman Seminar II

Second course in a two-course sequence. Gives the entering first-year student an overview of mechanical engineering and helps integrate the incoming student into the RIT community. Topics include the program of study, the cooperative work experience and course advising. In addition, this course gives the student an opportunity to interact with the faculty, upper-division students and other first-year students in a project-oriented environment. Fulfills the university requirement for 1 credit of FYE. **Credit 1 (W)**

0304-202

#### Mechanical Engineering Studies

This course focuses on the development of good study skills and habits to promote academic success with first-year core classes essential to success in the mechanical engineering program. The course will provide mentoring to first-year students taking calculus and chemistry as well as first-year mechanical engineering courses. (Permission of instructor) **Class 1, Credit 1**

0304-214

#### Engineering Design Graphics

This course is an introduction to graphical communication as a tool in documenting the results of an engineering design. Emphasis is on the use of computer aided drafting and 3-D solid modeling systems to prepare working drawings packages of basic components and assemblies. Students combine the practice of sketching along with computer-based solid modeling to produce a parametric design. At the conclusion of the course, students will be able to prepare working drawings, with appropriate views, dimensions, tolerances, and supporting documentation. Students will demonstrate the use of title blocks, revision blocks, bill of materials and process documentation. **Lab 4, Credit 2**

0304-261

#### Cornerstone Design Project Lab

This course gives students an opportunity to apply foundation courses in mechanical engineering to the solution of an open-ended design problem. Students will learn about project definition, concept development, feasibility assessment, managing design parameter tradeoffs using engineering analysis, and developing a preliminary design drawing package. Teams of students will develop their concept through the stage of working drawings, based on the ANSI standard for geometric dimensioning and tolerancing. The course is intended to prepare students for future ME and multi-disciplinary design courses. (0304-214, 336, 347, 413, 415, and at least one co-op block) **Lab 4, Credit 2**

0304-280

#### Measurement, Instrumentation, Controls I

This course is designed to introduce students to fundamental laboratory techniques and familiarize them with hardware and software tools. Students learn how to obtain and interpret measurements of physical parameters and properties such as temperature, pressure and flow rate. Students learn how to interface a computer to physical devices such as relays and voltage output. Classroom demonstrations of MIC systems provide students with an appreciation for engineering applications. **Lab 4, Credit 2**

0304-331

#### Mechanics I

For students majoring in industrial and systems engineering. Statistics: equilibrium, the principle of transmissibility of forces, couples, centroids, trusses, frames, machines and friction. Introduction to strength of materials: axial stresses and strains, statically indeterminate problems, torsion and bending. (1017-311) **Class 3, Credit 3**

0304-332

#### Mechanics II

For students majoring in industrial and systems engineering. Topics include dynamics of particles and rigid bodies with an introduction to kinematics and kinetics of particles and rigid bodies, work, energy, impulse momentum and mechanical vibrations. Emphasis is on problem solving. (0304-331) **Class 3, Credit 3**

- 0304-336** **Statics**  
This basic course treats the equilibrium of particles and rigid bodies under the action of forces. It integrates the mathematical subjects of calculus, vector algebra and simultaneous algebraic equations with the physical concepts of equilibrium in two and three dimensions. Topics include concepts of force and moment, trusses, frames, machines, friction, centroids and moments of inertia. (1016-282, or 1016-273, 1017-311) **Class 4, Credit 4**
- 0304-342** **Problem Solving with Computers**  
Introduces students to personal computers for solving science and engineering problems. Students also learn to interpret and analyze their results and document their solutions. The course covers principles and techniques of computer programming to analyze and solve problems and to document both numerically and graphically the results of the analysis. Programming and analysis of problems are implemented using either a spreadsheet or a symbolic algebra system with supplemental documentation and communication of results using a word processor. (Corequisite 1016-271 or 1016-281) **Class 2, Lab 2, Credit 3**
- 0304-343** **Materials Processing**  
A study of the application of machine tools and fabrication processes to engineering materials in the manufacture of products. Processes covered include cutting, molding, casting, forming, powder metallurgy and welding. Students do a project in the lab portion of the course. **Class 3, Lab 2, Credit 4**
- 0304-344** **Materials Science**  
The structure and properties of metallic, polymeric, composite and ceramic materials as related to structural imperfections, atom movements and phase changes. Develops a basic understanding of the structure/properties relationship in materials and their behavior in service environments. (1011-208) **Class 3, Lab 2, Credit 4**
- 0304-347** **Mechanics of Materials**  
A basic course in the fundamental principles of the mechanics of deformable media, including stress, strain, deflections and the relationships among them. The basic loadings of tension, compression, shear, torsion and bending are also included. Mechanics of Materials Lab (0304-348) is to be taken concurrently with this course. (0304 336; corequisite 0304-348) **Class 4, Credit 4**
- 0304-348** **Mechanics of Materials Lab**  
A required laboratory course taken concurrently with 0304-347. Illustrates the mechanical behavior of common engineering materials. Students investigate a material's response to axial, torsional and bending loads. In addition students are introduced to statistical analysis of data, basic experimental techniques and effective report writing. (0304-336; corequisite 0304-347) **Lab 2, Credit 1**
- 0304-359** **Dynamics**  
A basic course in the kinematics and kinetics of particles and rigid bodies. Newton's laws and the theorems of work-energy and impulse-momentum are applied to a variety of particle problems. Systems of particles are employed to transition to the analysis of rigid body problems. Absolute and relative motion are used to investigate the kinematics and kinetics of systems of rigid bodies. Newton's laws and the theorems of work-energy and impulse-momentum are also applied to a variety of rigid body problems. (0304-336) **Class 5, Credit 5**
- 0304-413** **Thermodynamics**  
A basic course introducing the classical theory of thermodynamics. Applications of the first law of thermodynamics are used to introduce the student to thermodynamic processes for closed and open systems. The Clausius and Kelvin-Planck statements of the second law are then correlated with the concept of entropy and enthalpy to investigate both real and reversible processes and the thermodynamic properties of pure substances. (1016-282 or 1016-273, 1017-312) **Class 4, Credit 4**
- 0304-415** **Fluid Mechanics**  
Includes the physical characteristics of a fluid: density, stress, pressure, viscosity, temperature, vapor pressure, compressibility. Descriptions of flows: Lagrangian and Eulerian, stream lines, path lines, streak lines. Classification of flows. Fluid statics: hydrostatic pressure at a point, pressure field in a static fluid, manometry, forces on submerged surfaces, buoyancy, standard and adiabatic atmospheres. Flow fields and fundamental laws: systems and control volumes, Reynolds transport theorem, integral control volume analysis of basic equations for stationary and moving control volumes. Inviscid Bernoulli and the engineering Bernoulli equation, some applications. Incompressible flow in pipes, laminar and turbulent flows, separation phenomenon. Dimensional analysis: Buckingham's pi-theorem, similitude, model studies. (0304-413) **Class 4, Credit 4**
- 0304-416** **Thermal Fluids Lab I**  
This laboratory course pertains to topics covered in Thermodynamics (0304-413) and Fluid Mechanics (0304-415). Each laboratory experiment is designed to quantify the differences between real and ideal systems through rigorous system analysis. Students will work in teams to evaluate various thermo-fluid systems. Extensive analysis is used to calculate system characteristics and to graph and predict system behavior. (0304-413; corequisite 0304-415) **Lab 2, Credit 1**
- 0304-437** **Design of Machine Elements**  
The analysis and theory of machine design in the context of failure theories. Particular emphasis is on the design and analysis of machine elements and fatigue. A discussion of engineering professionalism and ethics is also included. (0304-347) **Class 4, Credit 4**
- 0304-440** **Numerical Methods**  
A study of numerical methods to model and solve engineering problems using a computer. Students learn to analyze and interpret the numerical solutions obtained. Topics include roots of algebraic and transcendental equations, linear systems, curve fitting, numerical differentiation and integration, and ordinary differential equations. Applications are taken from students' background in statics, mechanics, dynamics, mathematics and thermodynamics. (Corequisite 1016-318; prerequisite 0304-342 or corequisite 0304-441; corequisite 1016-318; prerequisite 0304-342 or corequisite 0304-441; corequisite 0304-347) **Class 4, Credit 4**
- 0304-460** **Contemporary Issues/ Energy and Environment**  
This course lays the foundation for studies in energy and the environment. Topics include an introduction to energy-intensive systems and how they interact with the environment. Specific attention is focused on domestic and international current events and how these events will shape our future energy production and utilization. This course may be used as a free elective. (Third-year standing in an engineering discipline) **Class 4, Credit 4**
- 0304-461** **Contemporary Issues in Bioengineering**  
This course lays the foundation for studies in bioengineering. Topics include the principles of living systems, fundamentals of biomolecular and cellular engineering, engineering applications and medical engineering. This course may be used as a free elective. (Third-year standing in an engineering discipline) **Class 4, Credit 4**
- 0304-500** **Study Abroad**  
01 - Mechanical Engineering Independent Study, Credit 1-8  
02 - Mechanical Engineering Free Elective, Credit 1-8  
03 - Mechanical Engineering Technical Elective-Design, Credit 1-8
- 0304-514** **Heat Transfer**  
A basic course in the fundamentals of heat transfer by conduction, convection and radiation, together with applications to typical engineering systems. Topics include one-dimensional steady state and transient heat conduction, radiation between black bodies and gray bodies, correlations for the Nusselt number in forced and natural convection, and an introduction to heat exchanger design by LMTD and NTU methods. (0304-413, 415) **Class 4, Credit 4**
- 0304-518** **Advanced Computational Techniques**  
This extension of Numerical Methods 0304-440 covers finite element and finite difference techniques and their applications in mechanical engineering (structural analysis, heat transfer, fluid mechanics). (0304-440) **Class 3, Lab 2, Credit 4**
- 0304-540** **Introduction to Auto Design and Manufacture**  
An introduction to the design and manufacturing practices employed in typical automotive industries. Design practices that are currently implemented in industry will be emphasized, including the use of computer-aided engineering, software, and statistical analysis. The regularly scheduled lecture periods will include guest lecturers from automotive manufacturers to introduce students to current manufacturing technologies. This course may be used as a free elective. (Fourth-year standing in ME program; registration preference given to students enrolled in the automotive option) **Class 4, Credit 4**

- 0304-543** **System Dynamics**  
This required course introduces the student to lumped parameter system modeling, analysis and design. The determination and solution of differential equations that model system behavior is a vital aspect of the course. System response is characterized in both time and frequency domains. The design of systems or sub-systems is evaluated based on performance criteria, and design modifications are suggested from alternate modeling scenarios. Associated projects introduce students to simulation software. (0304-359, 1016-306, 0301-381) **Studio Class 6, Credit 5**
- 0304-550** **Transport Phenomena**  
A second course in fluid mechanics, integrating concepts of heat and mass transfer. Use of the differential form of the fundamental equations of the conservation of mass, momentum and energy is derived and used throughout. Topics include potential flow, viscous internal plane and pipe flows, external boundary layers, and the convective transport of heat and mass. (1016-318, 0304-415; corequisite 0304-514) **Class 4, Credit 4**
- 0304-551** **Thermal Fluids Lab II**  
A laboratory course based on the materials covered in Heat Transfer I 0304-514 and Transfer Phenomena 0304-550. Students perform various experiments of contemporary interest to the fields of heat transfer and transport. Each lab is preceded by a lecture covering an in-depth analysis of the lab experiment. Students are required to work on an assignment related to the experiment using the textbooks and reference materials available in the library. After performing the experiments, students perform the required analysis, including error analysis and comments on identifying the sources of error and how to reduce them. Students submit a detailed lab report that is graded on the technical content as well as writing skills. (Students completing the Aerospace option do not need to complete this course.) (0304-514, corequisite 0304-550) **Lab 2, Credit 1**
- 0304-560** **Introduction to Aerospace Engineering**  
Lays the foundation for studies in aerospace engineering. Topics include the history of aviation, basic aerodynamics, airfoils, wings and other aerodynamic shapes, airplane performance, stability and control, propulsion and aircraft structures. This course may be used only as a free elective. (0304-359, 415; registration preference is given to students enrolled in the aerospace option) **Class 4, Credit 4**
- 0304-575** **Aerodynamics**  
This course presents the essentials of aerodynamic theory. Topics include differential equations of fluid mechanics, airfoil theory, wings of finite span, inviscid potential flows, laminar and turbulent boundary layer. Airfoil design is explored through software. A design project is required. (0304-560; registration preference is given to students enrolled in the aero option) **Class 4, Credit 4**
- 0304-599** **Independent Study**  
A student project course encompassing both analytical and experimental work. (Fourth- or fifth-year standing) **Credit variable**
- 0304-604** **Design for Manufacture**  
The student learns how to design parts for economical manufacture and how to design assemblies with the optimum number of parts. This project-based course includes lectures on the creative process. The student uses both manual and software techniques to calculate assembly design efficiencies and software techniques to determine part and part tooling costs. (0304-344) **Class 4, Credit 4**
- 0304-610** **Topics in Mechanical Engineering Design**  
In response to student and/or faculty interest, special courses of current interest and/or logical continuation of regular courses are presented. A design project is required. **Class 4, Credit 4**
- 0304-615** **Robotics**  
An applied course in the fundamentals and applications of industrial robots. Emphasis is on the use of microcontrollers to construct mobile robots. Topics include microcontroller programming, industrial robot fundamentals, DC servo and stepper motors, encoders, sensors, programming, gripper design and safety. A major emphasis is on a design project involving the design, build and test of a mobile robot for an application. (Fourth- and fifth-year standing) **Class 3, Lab 2, Credit 4**
- 0304-618** **Computer-Aided Engineering**  
Introduces the mechanical engineering student to the procedures and techniques used to integrate the computer into the engineering and design cycle. The student is exposed to commercial software used in industry. Topics include solids modeling, finite elements, stress analysis, static and dynamic structural analyses, and heat transfer. A real-world design project is selected from one or more of the topics covered. (0304-437, 518) **Class 3, Lab 2, Credit 4**
- 0304-620** **Introduction to Optimal Design**  
This course is an introduction to basic optimization techniques for engineering design synthesis. Topics covered include: basic concepts, the general problem statement, necessary conditions of optimization, numerical techniques for unconstrained optimization, constrained optimization through unconstrained optimization, and direct methods. Numerical solutions are obtained using commercially available software. A design project is required. (0304-437, 440) **Class 4, Credit 4**
- 0304-624** **Vehicle Dynamics**  
Deals with the fundamentals of ground vehicle stability and control. The contributions of tire lateral force, stiffness and aligning torque to vehicle stability are discussed. Bicycle and four-wheel vehicle models are analyzed for neutral, under- and over-steer characteristics. The effects of suspension geometry, chassis stiffness and roll stiffness on stability and handling are analyzed. (0304-543; registration preference is given to students enrolled in the automotive option) **Class 4, Credit 4**
- 0304-626** **Automotive Control Applications**  
Examines several key vehicle control subsystems. Such subsystems include engine sensors and controls, anti-lock brake systems, cruise control and semi-active suspensions. Relevant modeling, computer simulations and experiments will be performed. (0304-543; registration preference is given to students enrolled in the automotive option) **Class 4, Credit 4**
- 0304-629** **Renewable Energy Systems**  
This course provides an overview of renewable energy system design. Energy resource assessment, system components and feasibility analysis will be covered. Possible topics to be covered include photovoltaics, wind turbines, solar thermal and hydropower. Students will be responsible for a final design project. (0304-415, 514) **Class 4, Credit 4**
- 0304-630** **Senior Design I**  
The first of a two-course capstone design sequence. Students work in design teams in an environment approximating an industrial setting. Emphasis is on teamwork and on developing good oral, written and interpersonal communication skills. In this course, student teams develop their proposed final design of a mechanical system after identifying possible alternative concepts. The final design must be supported by sound engineering analyses and by engineering drawings necessary to build a prototype. (This course is intended to be taken as a capstone design experience near the conclusion of the student's program of study. Students must have fifth-year standing, have completed three co-op blocks and have consent of the department. Students must submit a departmentally approved plan of study for degree completion.) **Class 4, Credit 4**
- 0304-631** **Senior Design II**  
The second of the two-course capstone design sequence. The same student teams from Senior Design I return to build and test a working prototype of their previously developed final design. Non-working prototypes are not acceptable, and some redesign work may be required to make the system work. Continued emphasis is on teamwork and developing good oral, written and interpersonal communication skills. (0304-630) **Class 4, Credit 4**
- 0304-633** **Sustainable Energy Management and the Built Environment**  
This course, Sustainable Energy Management and the Built Environment, provides an overview of mechanical and associated control systems within buildings with an emphasis on sub-systems that possess the most visible energy signature in terms of energy usage, energy inefficiency and societal/global impact. Fundamentals of system operation are explored as well as energy management techniques. Using domestic and international case studies that highlight energy management within the built environment, students will explore methods by which engineers have achieved solutions aligned with sustainability. (0304-643, 660) **Class 4, Credit 4**

- 0304-635 Heat Transfer II**  
Consists of the numerical solution of heat transfer problems. One- and two-dimensional steady-state as well as transient conduction cases are analyzed. A detailed study of single-phase forced and natural convective heat transfer is presented. Heat transfer during pool boiling, flow boiling and condensation is studied. Design aspects of heat transfer equipment are introduced. The students undertake a major design project. (0304-440, 514) **Class 4, Credit 4**
- 0304-638 Design of Machine Systems**  
This is an applied course in the selection of components and integration of those components into electro-pneumatic-mechanical devices and systems. Topics involve all aspects of machine design, including drive components and systems, motion generation and control, and electrical control hardware and strategy. (0304-359, 437; 0301-381) **Class 4, Credit 4**
- 0304-639 Alternative Fuels and Energy Efficiency for Transportation**  
This course, Alternative Fuels and Energy Efficiency for Transportation, provides an overview of the potential alternative fuels and energy efficiency technologies for powering current and future vehicles. Alternative fuel production technologies and utilization of fuels such as biodiesel, ethanol and hydrogen will be covered. The primary technical and environmental issues associated with these alternative fuels will be discussed. Approaches to improving vehicle efficiency will also be explored. Students will be responsible for a final design or research project. (0304-640) **Class 4, Credit 4**
- 0304-640 Internal Combustion Engines**  
An introduction to the operation and design of internal combustion engines. Topics include engine types and cycles, fuels, intake and exhaust processes, emissions and emission control systems, heat transfer and lubrication. (0304-413, 514, corequisite: 550, registration preference is given to students enrolled in the automotive option) **Class 4, Credit 4**
- 0304-643 Control Systems**  
Introduces the student to linear control systems and their behavior, design and use in augmenting engineering system performance. Topics include control system behavior characterization in time and frequency domains, stability, error and design. This is accomplished through classical feedback control methods that employ the use of Laplace transforms, block diagrams, root locus, and Bode diagrams. A companion laboratory will provide students with significant hands-on analysis and design experience. (0304-543) **Class 3, Lab 3, Credit 4**
- 0304-644 Introduction to Composite Materials**  
This is an applied course in the fundamentals and applications of composite materials. Topics covered include constituents of composite materials, fabrication techniques, micromechanical analysis, macromechanical analysis, and the use of composites in design. Some laboratory work will be done, and a major design project is required. (0304-344, 347, 518) **Class 4, Credit 4**
- 0304-645 Introduction to Biomaterials**  
This course provides an overview of materials used in biomedical applications, both internal and external to the human body. Structure and properties of biomaterials will be covered, in addition to material performance in hostile environments. Some experiments will be performed in class. A variety of applications will be covered, with topics to be selected based partly on student interest. Each student will research the material and past performance of a bioengineering product; the work will be presented to the class during week 10. (0304-344, permission of instructor or department approval required) **Class 4, Credit 4**
- 0304-646 Biomedical Device Engineering**  
This course is an introduction to the design of medical devices and issues that are unique to these devices. Course content includes some historical background, an overview of existing devices and trends, material selection, interfaces of medical devices with biological tissues, product testing reliability, and regulations specific to the design and validation of medical devices. A substantial part of the course is a project, in which students will be required to work in teams to complete a preliminary design of a novel device, including appropriate analysis and documentation. Analysis methods learned from prior coursework in the student's discipline will be applied to this component of the course (Fourth-year standing. Registration preference is given to students enrolled in the bioengineering option) **Credit 4, Class 4**
- 0304-652 Fluid Mechanics of Turbomachinery**  
Examines the basic principles applicable to all turbomachinery as well as consideration of the operating and design characteristics of several basic classes of turbomachinery. Includes a major design project. (0304-415) **Class 4, Credit 4**
- 0304-658 Engineering Vibrations**  
The theory of mechanical vibrations with an emphasis on design applications and instrumentation. Fourier analysis techniques, numerical and experimental analysis and design methods are presented in addition to theoretical concepts. Vibrations of single-degree of freedom systems are covered, including free-damped and undamped motion, and harmonic and transient-forced motion, such as support motion, machinery unbalance and isolation. Modal analysis of multidegree of freedom systems is introduced. In addition to laboratory exercises on vibration instrumentation, an independent design project is assigned. (0304-543) **Class 3, Lab 2, Credit 4 (F, W)**
- 0304-660 Refrigeration and Air Conditioning**  
This is a basic course in the principles and applications of refrigeration and air conditioning involving mechanical vapor compression and absorption refrigeration cycles, associated hardware, psychometrics, heat transmission in buildings and thermodynamic design of air conditioning systems. Students are expected to do a design project. (0304-514; registration preference is given to students enrolled in the energy and environment option) **Class 4, Credit 4**
- 0304-671 Aerostructures**  
The course covers the principles of deformable bodies as applied to the analysis and design of aircraft and space vehicle structures. Topics include the study of bending and torsion of thin-walled, multi-cell beams and columns; wing and fuselage stress analysis; and structural stability. Strain energy concepts and matrix methods are utilized throughout the course. (0304-437, 518; registration preference is given to students enrolled in the aerospace option) **Class 4, Credit 4**
- 0304-672 Dynamics of Machinery**  
An introduction to the fundamentals and applications of machinery design. Basic concepts such as linkage classification, mobility and motion characteristics are introduced. The kinematics and dynamic analyses of planar lower-pair linkages are carried out using analytical vector methods and graphical methods. The design and analysis of cams are treated by graphical and analytical methods. Major emphasis is placed on a term project in which a mechanism for specific application is cinematically and dynamically analyzed. (0304 543) **Class 4, Credit 4**
- 0304-673 Aeromechanics Laboratory**  
A companion laboratory course for 0304-671 and 0304-675 illustrating the behavior of advanced engineering structures and aerodynamic principles common to aircraft and spacecraft design. Students investigate the bending and torsion of thin-walled single-cell and multi-cell members. Wind tunnel experiments investigate basic concepts of lift and drag on bluff bodies, wing sections and lifting bodies. Boundary layer characterization is simulated on digital computers and investigated experimentally. Structural analysis and design evaluation are also simulated where appropriate. (0304-560; corequisites 0304-671, 575; registration preference is given to students enrolled in the aerospace option) **Lab 2, Credit 1**
- 0304-678 Propulsion**  
The course covers the fundamentals of propulsion, including the basic operating principles and design methods for flight vehicle propulsion systems. Topics include air-breathing engines (turbojets, ramjets, turboprops and turbofans) as well as liquid and solid propellant chemical rockets. (0304-514 and 0304-550 or 0304-560; registration preference is given to students enrolled in the aerospace option) **Class 4, Credit 4**
- 0304-680 Advanced Thermodynamics**  
Advanced design and analysis of gas and vapor power cycles, including cogeneration and combined cycles, using concepts of exergy based on the Second Law of Thermodynamics and the field of thermo-economics. Emphasis is also placed on determining entropy generation and irreversibility within fuel cells and fossil fuel combustion processes using chemical exergy as well as developing equations of state. (0304-413; registration preference is given to students enrolled in the energy and environment option) **Class 4, Credit 4**
- 0304-682 Flight Dynamics**  
This course deals with the three-dimensional dynamics of aircraft, including general aircraft performance, stability and control, and handling qualities. Topics include mathematical development of equations-of-motion describing full range of aircraft motion; aerodynamic forming term coefficient development, quaternion alternative; linearization of nonlinear aircraft models, determination of range, endurance and rate of climb; simulation of aircraft trajectory; static and dynamic stability; aircraft control; and aircraft handling qualities introduction. (0304-543, 560, registration preference is given to students enrolled in the aerospace option) **Class 4, Credit 4**

**0304-683** **Orbital Mechanics - Mission to Mars**  
This course introduces orbital mechanics and space flight dynamics theory with application for Earth, lunar, and planetary orbiting spacecraft. Content includes historical background and equations of motion, two-body orbital mechanics, orbit determination, orbit prediction, orbital maneuvers, lunar and interplanetary trajectories, orbital rendezvous and space navigation (time permitting). The two-body orbital mechanics problem, first approximation to all exploration orbits or trajectories, is covered with an introduction to the three-body problem. Students develop computer-based simulations of orbital mechanics problems including a final mission project simulation from Earth to Mars and home again, requiring a number of orbit phases and transfers between these phases. (Registration preference is given to students enrolled in the aerospace option) **Class 4, Credit 4**

**0304-694** **Stress Analysis**  
Extends the student's theoretical, numerical and experimental base of knowledge beyond an introductory level. The state properties of stress, strain and elastic deformation and their relationships are reviewed in detail. Topics from advanced strength of materials and elasticity theory are covered, including unsymmetrical bending, shear flow in thin-walled sections, curved beams, torsion in thin-walled tubes, and three-dimensional coordinate transformations. The use of the finite element software presented in 0304-518 Advanced Computational Techniques is extended to more complex design-oriented problems. Experimental topics include the use of strain gages. A design project is assigned that utilizes numerical and/or experimental methods. (0304-437; corequisite 0304-518) **Class 4, Credit 4**

**0304-698** **Independent Study Design Project**  
A design-oriented independent study requiring a major design project. (Senior standing) **Credit 4**

**0304-699** **Special Topics**  
In response to student and/or faculty interest, special courses that are of current interest and/or logical continuation of regular courses will be presented. (Permission of the supervising faculty member and the department head required) See instructor for more details. **Class 4, Credit 4**

## Microelectronic Engineering

**0305-201** **Introduction to Microelectronics**  
An overview of semiconductor technology history and future trends is presented. The course introduces the fabrication and operation of silicon-based integrated circuit devices, including resistors, diodes, transistors and their current-voltage (I-V) characteristics. Laboratory teaches the basics of IC fabrication and I-V measurements. A five-week project provides experience in digital circuit design, schematic capture, simulation, breadboarding, layout design, IC processing and testing. **Class 3, Lab 3, Credit 4 (F)**

**0305-221** **Introduction to Micro/Nanolithography**  
An introduction to the fundamentals of micro/nanolithography. Topics include IC masking, sensitometry, radiometry, resolution, contact lithography, projection lithography, photoresist materials and processing. Laboratories include mask making, source characterization, resist characterization and stepper operation. (1011-208) **Class 3, Lab 3, Credit 4 (S)**

**0305-320** **Design of Experiments**  
An introduction to experimental design concepts for engineering applications. Topics covered include statistics, SPC, process capability analysis, experimental design, analysis of variance, regression and response surface methodology, and design robustness. Students will utilize statistical software (JMP IN) to analyze case studies and design efficient experiments. (1016-315 or equivalent) **Class 3, Lab 3, Credit 4 (W)**

**0305-350** **IC Technology**  
An introduction to the basics of integrated circuit fabrication. The electronic properties of semiconductor materials and basic device structures are discussed, along with fabrication topics, including photolithography diffusion and oxidation, ion implantation and metallization. The laboratory uses a four-level metal gate PMOS process to fabricate an IC chip and provide experience in device design and layout (CAD), process design, in-process characterization and device testing. Students will understand the basic interaction between process design, device design and device layout. (0305-201) **Class 3, Lab 3, Credit 4 (F, S)**

**0305-460** **Semiconductor Devices I**  
An introduction to the fundamentals of semiconductor materials and the effects of variations in the material properties of the resulting current-voltage characteristics for two terminal devices, namely resistors and diodes. Topics include electron energies in solids, the statistical physics of carrier concentration and motion in crystals, energy band models, drift and diffusion currents, recombination generation of carriers, continuity equations, and the p-n junction under equilibrium and bias conditions, and metal-semiconductor Schottky and ohmic contacts. Non-idealities associated with real diodes are introduced. Design of integrated two-terminal devices and electrical test demonstrations are required. (1017-314) **Class 4, Credit 4 (F, S)**

**0305-515** **Principles of Electromagnetic Fields**  
An introduction to the fundamentals of electrostatic, magnetostatic and time varying fields that culminate with Maxwell's equations, continuity and Lorentz force that govern the EM phenomena. The importance of Laplace's and Poisson's equations in semiconductor applications are described. Electromagnetic properties of material media are discussed with emphasis on boundary conditions. Plane wave solution of Maxwell's equations is derived and discussed in loss-less and lossy media. Applications in optics include reflection/refraction and polarization of light. An introduction to transmission line theory that applies to interconnects is provided through PSPICE simulation. A strong knowledge of vector calculus is desired. (1016-328, 1017-313) **Class 4, Lab 0, (S, Su)**

**0305-520** **VLSI Design**  
Introduction to the design of CMOS very large scale integrated (VLSI) circuits. Extensive use of Mentor Graphics software in a networked workstation environment, including homework and design project. Topics include logic design and state machines, schematic capture, electrical simulation, geometrical layout, design and electrical rule checking. Standard cell libraries are used for selected assignments. Emphasis is placed on a further understanding of the fabrication process by discussion of mask layers, rule checks and circuit simulation. (0301-240, 482; 0305-350, 560) **Class 3, Lab 3, Credit 4 (S, SU)**

**0305-525** **Optics for Microelectronic Engineering**  
An introduction to the principles of optics in which reflection, refraction and transmission are explained as a result of interference between the excitation field and the atomic oscillations that result in the emission of spherical wavelets (Huygens Principle). Topics include Fresnel coefficients, imagery due to refraction at a single surface, simple lenses, ray tracing techniques, apertures, mirrors and thick lenses. Both the paraxial case (ideal imagery) and aberrations in spherical lenses are covered. An introduction to physical optics and the topics of diffraction and interferometry is provided. These topics set the stage for understanding ellipsometers, steppers, microscopes and other optical instrumentation utilized in IC manufacturing. Lab required. (1017-313) **Class 3, Lab 3, Credit 4 (F, W)**

**0305-560** **Semiconductor Devices II**  
An introduction to the physical mechanisms that govern the operation of metal-oxide semiconductor (MOS) capacitors, MOS field-effect transistors and related devices. Special emphasis is given to the relation between the structural parameters of these devices and their electrical characteristics. Modern structures and small-dimension effects are discussed. Device design and SPICE models for these devices are investigated. BJTs are covered after a thorough investigation of MOSFETs. (0305-460) **Class 4, Credit 4 (F, W)**

**0305-564** **Microlithography Systems**  
A course covering the physical aspects of lithography. Image formation in optical projection, optical proximity and high-energy systems (DUV/VUV, e-beam/SCALPEL, x-ray, and EUV) are studied. Fresnel diffraction, Fraunhofer diffraction, and Fourier optics are utilized to understand diffraction-limited imaging processes. Topics include illumination, lens parameters, image assessment (resolution, alignment and overlay), phase-shift masking, and resist interactions. Lithographic systems are designed and optimized through use of modeling and simulation packages. Current status of the practical implementation of advanced technologies in industry as well as future requirements will be presented. (0305-221, 320, 350) **Class 3, Lab 0, Credit 3 (S, SU)**

**0305-574** **Microlithography Systems Lab**  
Laboratory to be taken concurrently with 0305-564. Topics emphasize optical microlithography modeling, illumination systems, reticle enhancement techniques, alignment, and optimization of image capture related to focus, exposure and substrate reflectivity. **Class 0, Lab 3, Credit 1 (S, SU)**

0305-599

### Independent Study

A supervised investigation within a microelectronic area of student interest. Proposals for the independent study must be approved by the faculty member and department head and submitted prior to registration. **Class variable, Credit variable 1-4**

0305-632

### Silicon Processes

The fundamental silicon-based processing steps introduced in 0305-350 are expanded on to cover state-of-the-art issues such as thin oxide growth, atomistic diffusion mechanisms, advanced ion implantation and rapid thermal processing (RTP). Physical vapor deposition (PVD) to form conductive and insulating films is introduced. MOS capacitance voltage measurement and surface change analysis are studied. These topics are essential for understanding the fabrication of modern ICs. Computer simulation tools (i.e., SUPREM) are used to model processes, build device structures and predict electrical characteristics, which are compared to actual devices that are fabricated in the associated laboratory. (0305-350, 560) **Class 3, Lab 3, Credit 4 (F, W)**

0305-643

### Thin Film Processes

This course focuses on the deposition and etching of thin films of conductive and insulating materials for IC fabrication. A thorough overview of vacuum technology is presented to familiarize the student with the challenges of creating and operating in a controlled environment. Chemical vapor deposition (CVD) and electroplating technologies are discussed as methods of film deposition. Plasma etching and chemical mechanical planarization (CMP) are studied as methods for selective removal of materials. Applications of these fundamental thin film processes to IC manufacturing are presented. (0305-320, 350) **Class 3, Lab 3, Credit 4 (S, SU)**

0305-650

### CMOS Processing Lab

This is a laboratory course in which students manufacture and test CMOS integrated circuits. Topics include design of individual process operations and their integration into a complete manufacturing sequence. Students are introduced to work in process tracking, ion implantation, oxidation, diffusion, plasma etch, LPCVD and photolithography. Analog and digital CMOS devices are made and tested. This course is organized around multidisciplinary teams that address the management, engineering and operation of the student-run CMOS factory. (0305-632) **Class 2, Lab 6, Credit 4 (F, W)**

0305-666

### Microlithography Materials and Processes

Covers the chemical aspect of microlithography and resist processes. The chemistry of positive (novolac-based) and chemically amplified resist systems will be studied. Topics include the principles of photo polymerization, including synthesis, photo absorption and emission, processing technologies and methods of process optimization. Also, advanced lithographic techniques and materials, including multi-player techniques for BARC, TARC and silylation are applied to optical lithography. (0305-221, 320, 350) **Class 3, Lab 0, Credit 3 (F, W)**

0305-676

### Microlithography Materials and Processes Lab

The laboratory is taken concurrently with 0305-666. Materials characterizations and process optimizations will utilize experimental design techniques. Processes to be studied include development rate monitoring, DUV resists, BARC, resist silylation and SEM evaluation of imaged resists and etched structures. **Class 0, Lab 3, Credit 1 (F, W)**

0305-681

### Senior Design Project I

A capstone design experience for microelectronic engineering senior students. Students propose a 10-week project related to a microelectronic process, device, component or system to meet desired specifications within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. The students plan a timetable and write a formal proposal. The proposal is evaluated on the basis of intellectual merit, sound technical/research plan and feasibility. The proposed work is carried through in the sequel course, Senior Design Project II (0305-691). Each student is required to make a presentation of the proposal. (0305-320, 574, 632, 643) **Class 2, Lab 6, Credit 4 (F, W)**

0305-691

### Senior Design Project II

A capstone design experience for microelectronic engineering senior students. In this 10-week course, students conduct a hands-on implementation of the projects proposed in the previous course, Senior Design Project I. Technical presentations of the results, including a talk and a poster, are required at the annual conference on microelectronic engineering organized by the department in May. A written paper in IEEE format is required and is included in the conference journal. (0305-681) **Class 1, Lab 3, Credit 2 (S)**

## Computer Engineering

0306-200

### Introduction to Computer Engineering

Briefly describes the field of computer engineering and provides a frame of reference for the sequences of computer engineering, computer science and electrical engineering courses that appear in the computer engineering curriculum. Topics include an introduction to computers and computing, basic concepts, nomenclature, historical background and some elements of data representation. Teamwork, communication skills and contemporary issues are addressed. **Class 1, Credit 1 (F)**

0306-201

### Freshman Seminar

Introduces various topics of interest to computer engineering majors, including teamwork and aspects of engineering design. (0306-200) **Class 1, Credit 1 (W)**

0306-250

### Assembly Language Programming

An introduction to fundamental computer organization, assembly language programming and input/output techniques of a modern microprocessor system. Covers addressing methods, machine instructions, assembler directives, macro definitions, relocatability, subroutine linkage, data-structures, I/O programming, exception processing and interrupts. The assembly language program design techniques necessary to write efficient, maintainable device drivers are considered. An introduction to basic digital computer organization concepts also is provided. The Motorola MC 68000 microprocessor family of devices is used in most class examples and all required programming projects. (4003-232 and 0306-341) **Class 4, Lab 2, Credit 4 (F, W)**

0306-341

### Introduction to Digital Systems

Covers the specification, analysis and design of digital systems. The rapid growth of digital computers, control devices, instruments and communication equipment requires a basic knowledge and general methodology that can be adapted to rapidly evolving changes and constraints. The study of combinational and sequential systems considers the use of standard modules such as decoders, multiplexers, shifters, ROMs, PLAs, adders, registers and counters. The laboratory provides more insight into the physical and circuit aspects of the design and implementation of digital systems using commercial IC components as well as Mentor Graphics design tools. (0306-200 or department permission) **Class 3, Lab 3, Credit 4 (S, F)**

0306-351

### Hardware Description Languages

Presents modern approaches to digital system modeling and description. This includes the study of combinational and sequential systems using standard modules such as decoders, multiplexers, shifters, registers and counters. The laboratory provides more insight into the physical and circuit aspects of the design and implementation of digital systems using SSI, MSI and LSI components as well as CAD tools. (0306-341 and 4003-232) **Class 3, Lab 2, Credit 4 (W, S)**

0306-381

### Applied Programming

An introduction to classical algorithms used in the solution of numerical problems encountered in science and engineering. The C language will be introduced as a tool for implementing these algorithms. Topics include an introduction to C, computer number representation and round-off error, algorithms for finding roots of nonlinear equations, interpolation, numerical differentiation and integration, function approximation and data fitting solutions to systems of linear equations, and general matrix manipulation. This course is restricted to computer engineering students. (4003-334 and 1016-306) **Class 4, Credit 4 (F, W)**

0306-451

### Digital Signal Processing

This course introduces the student to the basic elements of discrete time signals and systems and fundamental signal processing techniques, such as FIR and IIR Filtering, the z transform and the Discrete Fourier transform. Theory is strengthened through MATLAB-based projects and exercises. (1016-306, 331, and 0306-381) **Class 4, Credit 4 (F, W)**



**0306-460** **Electronics for Computer Engineers**  
This course presents an introduction to electronics and covers basic principles of small-signal analysis of circuits with semiconductor devices, such as diodes, BJTs and MOSFETs. The p-n junction is introduced, followed by a study of bipolar junction transistor function. Includes: Rectification and power supply filtering and the basic operation and biasing of bipolar junction transistors; basic MOSFET current-voltage characteristics; DC biasing of MOS circuits, including integrated-circuit current sources/mirrors; small-signal analysis of single-stage MOS amplifiers; frequency response of BJT and MOS amplifiers; feedback and stability in amplifiers; ideal operational amplifiers in inverting, non-inverting and integrator configurations. Emphasis is on developing skills required for circuit analysis. Lab deals with basic experiments in electronics. (0301-382) **Class 4, Credit 4**

**0306-550** **Computer Organization**  
Provides an understanding of the information transfer and transformations that occur in a computer, with emphasis on the relations between computer architecture and organization. Topics include design levels and their respective primitives, modules and descriptive media, register transfer and micro-operations, basic computer organization and design, central processor organization, control unit and microprogramming, memory organization, input/output organization, computer architecture defining the hardware/software interface, and from architecture to organization. (0306-250) **Class 4, Credit 4 (S, SU)**

**0306-551** **Computer Architecture**  
Provides the critical tools to quantitatively analyze uniprocessor computer performance. Instruction-set architecture alternatives are described, and examples are presented of each alternative, such as load-and-store, CISC, stack, etc. Techniques to enhance performance, such as pipelining, cache memory and memory hierarchy, are presented. The use of vector processing, such as is used in supercomputers, is described and analyzed. Finally, the impact of input/output on computer performance is described. (0306-550) **Class 4, Credit 4 (F, W)**

**0306-553** **Digital Control Systems**  
Concentrates on the analysis, simulation and design of digital control systems using root locus, frequency response and state variable representation. The course also deals with the microprocessor-based implementation of digital filters for control applications. (0306-451) **Class 4, Credit 4 (S)**

**0306-560** **Interface and Digital Electronics**  
Introduction to some common transducers and transformations from raw measured quantity to transducer output. Also covered are instrumentation amplifiers, active filters, analog switching for applications in multiplexers, sample and hold circuits, the analog-to-digital and digital-to-analog conversions processes, and logic families, including TTL, ECL, CMOS, BiCMOS and their interfaces to each other. Mentor Graphics design tools are used to design active filters. (0306-460) **Class 3, Lab 3, Credit 4**

**0306-561** **Digital System Design**  
Covers the specification, analysis, design and implementation of digital systems. The hierarchical and structured design methodology is introduced. Both synchronous and asynchronous sequential machines are studied. Student designs incorporate MSI/LSI modules, PALS, EPROMS, FPGAs and elements of VHDL. Design for testability is emphasized. (0306-341, 351, 460) **Class 3, Lab 3, Credit 4 (S, SU)**

**0306-599** **Independent Study**  
Allows upper-level undergraduate students an opportunity to independently investigate, under faculty supervision, aspects of the field of computer engineering that are not sufficiently covered in existing courses. Proposals for independent study activities must be approved by both the faculty member supervising the independent study and the department head. (Permission of supervising faculty member and department head required) **Credit variable 1-4**

**0306-615** **Wireless Networks**  
As interest in wireless technology is booming, wireless networks are enjoying very fast growth. This course covers fundamental techniques in design and operation of first-, second- and third-generation wireless networks: cellular systems, medium access techniques, radio propagation models, error control techniques, handoff, power control, common air protocols (AMPS, IS-95, IS-136, GSM, GPRS, EDGE, WCDMA, cdma2000, etc.), radio resource and network management. As an example for the third-generation air interfaces, wireless Internet and sensor networks are discussed in detail since they are expected to have a large impact on future wireless networks. (0306-694) **Class 4, Credit 4**

**0306-620** **Design Automation of Digital Systems**  
Deals with the computer as a tool or aid in the design and creation of digital systems. The VHDL hardware description language is used to specify digital systems on the behavioral, data-flow, register, register-transfer and structural levels or logic elements levels. Simulation techniques and logic synthesis methods are studied and implemented on VHDL models using tools from Mentor Graphics Corporation. (0306-561) **Class 4, Credit 4 (F, W)**

**0306-624** **High-Performance Architectures**  
This course is an in-depth study of state-of-the-art high-performance computer architectures. The primary objective of the course is to understand the architectural features used in modern processors and the corresponding impact on performance. The course material will be derived from current and recent micro-architecture research publications. The course includes programming assignments and a term paper. (0306-551) **Class 4, Credit 4**

**0306-630** **Introduction to VLSI Design**  
An introduction to the design and implementation of very large scale integration (or VLSI), including NMOS and PMOS devices, CMOS circuits and digital subsystems. The procedures for designing and implementing digital integrated systems will be covered, including the Mead and Conway structured design approach consisting of the use of stick diagramming, scaling of CMOS design rules and techniques for estimating time delays. Emphasis will be placed on the use of static CMOS circuits and regular structures such as programmed logic arrays in custom and standard cell-based designs. The use of workstations with Mentor Graphics design tools for circuit simulation and for physical layouts will be stressed. Laboratory design projects will be required. (0306-561, 0306-460 or equivalent) **Class 4, Lab 2, Credit 4 (F, S, SU)**

**0306-631** **Advanced VLSI Design**  
A second course in the design and implementation of very large scale integrated (VLSI) circuits and systems. Emphasis will be on the design and use of dynamic precharge and precharge-evaluate CMOS circuitry, including Domino, NORA and Zipper CMOS logic, and subsystems. Basic requirements of a clocking system and a general clocking strategy for timing design in both static and dynamic CMOS circuits are investigated. Topics on the design and use of a standard cell library in the implementation of large system designs will be covered. The use of workstations with Mentor Graphics design tools and Synopsys synthesis tool suite will be required in laboratory projects leading to the design, VHDL synthesis and testing of an integrated circuit device. (0306-630, 351) **Class 4, Lab 2, Credit 4 (S)**

**0306-654** **Computer Engineering Design Projects I**  
The first of a two-course undergraduate capstone design sequence. Lecture materials include design process methodologies, team dynamics, engineering ethics, communication skills, current topics, real-time programming techniques, formulating independent project proposals, and an introduction to the laboratory tools available. Students undertake an initial independent design experience, formulate a proposal for the design of a multidisciplinary team project to be completed during the concluding course, and investigate important components of that multidisciplinary design project. (0306-560 and fourth-year standing in computer engineering) **Class 4, Credit 4 (W, S, SU)**

**0306-655** **Projects in Computer Engineering**  
This capstone design course entails several detailed projects involving the design of hardware and software to exercise students' engineering design creativity and ability to integrate concepts from throughout the curriculum. Some lectures are presented on real-time programming techniques such as interrupt handlers, multitasking concepts, process synchronization, response time considerations, rate monotonic scheduling, input noise reduction and debugging techniques. Other topics are also presented. (Fifth-year standing in computer engineering) **Class 4, Credit 4 (F, W)**

**0306-656** **CE Multidisciplinary Senior Design Project**  
This is the first of a two-course capstone design sequence and is taught in an environment that simulates an industrial setting. Students work in multidisciplinary design teams and generate design concepts and prototype solutions to real-world engineering problems. Emphasis is placed on engineering analysis, design and testing methodologies, teamwork and communication skills. (Fifth-year standing and department approval) **Class 4, Credit 4**

**0306-657** **Computer Engineering Design Projects II**  
The conclusion of a capstone undergraduate design projects course in computer engineering. Students will have prepared for the major course project during the previous course and will have done some detailed project analysis over the intervening co-op work period. This course begins with project design reviews presented to the class and selected faculty members. Project performance analysis and reliability will be major metrics. (0306-654) **Class 4, Credit 4 (F, W, S)**

**0306-659** **CE Multidisciplinary Senior Design Project II**  
This is the second of a two-course capstone design sequence and is taught in an environment that simulates an industrial setting. Students work in multidisciplinary design teams and generate design concepts and prototype solutions to real-world engineering problems. Emphasis is on engineering analysis, design and testing methodologies, teamwork and communication skills. (0306-656 and fifth-year standing) **Class 4, Credit 4 (W, S)**

**0306-661** **Engineering Design of Software**  
An advanced course moving the student beyond computer programming to the engineering of complex software systems. At the end of this class, students will learn how to make the right selection of design methodologies or architectures, produce executable structure models that can be verified by computer, formulate a design that meets all functional and performance requirements, and perform trade-off analyses that enhance decision making. Students work in teams on large-scaled software projects. (4010-361) **Class 4, Credit 4**

**0306-662** **Concurrent and Embedded Software Design**  
This course introduces methods for developing and designing concurrent software and embedded software. Formal logical formulas are used to characterize sets of states and sets of program behaviors. The software is then analyzed by manipulating these logical formulas. Several classical concurrent programming problems such as critical sections, producers and consumers, and resource allocation are examined. Practical examples and exercises are used to illustrate points and evaluate design tradeoffs. (0306-661 or permission of instructor) **Class 4, Credit 4**

**0306-663** **Embedded and Real-Time Systems**  
Conducted in a studio class/lab format with lecture material interspersed with lab work, this course presents a general road map of real-time and embedded systems. Microcontrollers used as external, independent performance monitors of more complex real-time systems. Much of the material focuses on a commercial real-time operating system, using it for programming projects on development systems and embedded target systems. Fundamental material on real-time operating systems is presented, including scheduling algorithms, priority inversion, and hardware-software co-design. (4010-361 and 0306-250 or equivalent) **Class 4, Credit 4**

**0306-664** **Modeling of Real-Time Systems**  
This course introduces the modeling of real-time software systems. It takes an engineering approach to the design of these systems by analyzing a model of the system before beginning implementation. UML will be the primary modeling methodology, but non-UML methodologies will also be discussed. Implementations of real-time systems will be developed manually from the models and using automated tools to generate the code. (0306-663) **Class 4, Credit 4**

**0306-672** **Special Topics in Compute Engineering**  
Topics and subject areas that are not among the courses listed here are frequently offered under this title. Under the same title also may be found experimental courses that may be offered for the first time. Such courses are offered in a formal format; that is, regularly scheduled class sessions with an instructor. The level of complexity is commensurate with a senior-level undergraduate/first-year graduate technical course. **Class 4, Credit 4**

**0306-675** **Robotics**  
This course is a hands-on seminar-style survey of mobile robotics. The development of the field and an overview of the different approaches to mobile robot guidance (knowing where we are and where we want to go), navigation (formulating a plan to get where we want to go) and control (following a desired path) will be given. The emphasis will be on algorithms and techniques. (0306-451) **Class 4, Credit 4**

**0306-676** **Robust Control**  
One of the most useful qualities of a properly designed feedback control system is robustness; i.e., the ability of the closed-loop control system to continue to perform satisfactorily despite large variations in the (open-loop) plant dynamics and the environment. This new approach has been successfully applied to high-performance servo drive systems, unmanned aerial vehicles, visual feedback systems and mobile robots, among others. This course will provide an introduction to state-of-the-art techniques for analysis and design of robust feedback systems. MATLAB will be used extensively for analysis, design and simulation. (0306-553 or equivalent, 1016-331 or equivalent is recommended) **Class 4, Credit 4**

**0306-684** **Digital Image Processing Algorithms**  
This is a first course in digital image processing that emphasizes both theory and implementation. Two-dimensional sampling, transforms and filtering are introduced and used for image enhancement, compression, restoration, segmentation and applications in color and video processing. Project assignments involve MATLAB implementation of algorithms and paper reviews. (0306-451) **Class 4, Credit 4**

**0306-685** **Computer Vision**  
This course covers both fundamental concepts and the more advanced topics in computer vision. Topics include image formation, color, texture and shape analysis, linear filtering, edge detection and segmentation. In addition, students are introduced to more advanced topics, such as model-based vision, object recognition, digital image libraries and applications. Homework, literature reviews and programming projects are integrated with lectures to provide a comprehensive learning experience. (0306-451 or permission of instructor) **Class 4, Credit 4**

**0306-694** **Data and Computer Communications**  
Provides a unified view of the broad field of data and computer communications and networks. Emphasis is on the basic principles underlying the technology of data and computer networks. Critical issues on data communication networks as well as the current and evolving standards in computer communications architecture are discussed. The topology, access control and performance of various types of networks are studied in detail. A comprehensive student project is required. (1016-351 and at least fourth-year standing or permission of instructor) **Class 4, Credit 4 (F, W)**

**0306-695** **Networking Security**  
This course covers a set of advanced topics in the networking area. The topics include advanced scheduling algorithms (e.g., WRQ), queue management schemes (e.g., RED) and network security (e.g., cryptography, DOS, key management, firewalls, etc.). In addition, networking programming based on Java (RMI, UDP/TCP socket, etc.) and network simulation using C++ and OPNET will be introduced and carried as course projects. (0306-694 or equivalent, 0306-740 or equivalent) **Class 4, Credit 4**

**0306-699** **Independent Study**  
Allows upper-level graduate students an opportunity to independently investigate, under faculty supervision, aspects of the field of computer engineering that are not sufficiently covered in existing courses. Proposals for independent study activities are subject to approval by both the faculty member supervising the independent study and the department head. (Permission of the supervising faculty member and the department head required.) **Credit variable 1-4**

## Applied Statistics

**0307-315** **Statistics for Engineers**  
Descriptive statistics, probability, measurement techniques, normal distribution and central limit theorem applied to confidence intervals and statistical inference, control charts: Topics will be related to engineering through real-world examples. (Grade of C or better in 1016-283 or grade of C or better in 1016-282 and coregistration in 1016-283) **Credit 4 (F)**

**0307-361** **Probability and Statistics for Engineers I**  
The course covers statistics in engineering, enumerative and analytic studies, descriptive statistics and statistical control, sample spaces and events, axioms of probability, counting techniques, conditional probability and independence, distributions of discrete and continuous random variables, joint distributions, central limit theorem. (1016-283 or 1016-274) **Credit 4 (F)**

**0307-362** **Probability and Statistics for Engineers II**  
The course covers point estimation; hypothesis testing and confidence intervals; one- and two-sample inference; and introduction to analysis of variance, experimental design, control charts and measurement studies. (0307-361) **Credit 4 (W)**

**0307-442** **Statistical Computing**  
This course focuses on the programming language used in SAS statistical software to read in raw data, create and manipulate SAS data sets, and create SAS macros. This course covers the material required for SAS Base Programmer certification. Students seeking employment in statistical professions are encouraged to attain this certification. Corresponding Minitab commands and macro programming will also be covered. (0307-362 or 1016-352) (Cross-listed with 0307-742.) **Credit 4 (F)**

# College of Imaging Arts & Sciences

## Index

2001	Interdisciplinary Imaging Arts	59
2009	New Media Design and Imaging	66
2010	Graphic Design	67
2012	Extended Studies: Art, Design	62
2013	Foundation Courses	59
2014	Computer Graphic Design	69
2015	Interior Design	70
2019	Illustration	63
2020	Medical Illustration	65
2021	Fine Arts Studio	66
2035	Industrial Design	71
2039	Art History	60
2040	Ceramics	72
2041	Glass	72
2042	Metals	73
2043	Textiles	73
2044	Wood	73
2045	General Crafts Studies	74
2046	Crafts Extended Studies	75
2060	Fine Art Photography	80
2061	Biomedical Photography	81
2065	Film and Animation	75
2067	Photographic Arts	82
2068	Imaging Systems Management	84
2076	Imaging and Photographic Technology	84
2080	Printing Management	85
2081	Printing Technology	86
2082	Graphic Media	86
2083	New Media Publishing	88

*Course numbering: RIT courses are generally referred to by their seven-digit registration number. The first two digits refer to the college offering the course. The third and fourth digits identify the discipline within the college. The final three digits are unique to each course and identify whether the course is noncredit (less than 099), lower division (100–399), upper division (400–699), or graduate level (700 and above).*

*Unless otherwise noted, the following courses are offered annually. Specific times and dates can be found in each quarter's schedule of courses, published by the Office of the Registrar. Prerequisites/corequisites are noted in parentheses near the end of the course description.*

### Interdisciplinary Imaging Arts

**2001-555 E.S.P.R.I.T. Production**  
Students produce a special-interest publication(s), E.S.P.R.I.T., via print and/or electronic methods. They are required to design and build the publication(s) by working beyond normally scheduled class hours. Lectures and hands-on activities enable each student to discover the applications of electronic imaging; interactive publishing; electronic publishing (CD-ROM or Internet); desktop publishing via print, page and screen design; as well as the procedures necessary to provide quality results. Lecturers include faculty from the schools of Photographic Arts and Sciences, Printing Management and Sciences, Art, Design, School for American Crafts and other institute disciplines as deemed appropriate. (Matriculated senior- or graduate-level status and instructor's approval based on student's experience and production team's needs) **Credit 4**

### Foundation Courses

**2013-205 Creative Sources**  
Creative Sources is a lecture series designed to expose students to a broad range of faculty and other creative professionals focusing on topics in the fields of art, design and craft. The fall quarter will focus on guest speakers from the faculty of the College of Imaging Arts and Sciences. They have been asked to share their experiences regarding personal inspiration and growth and their inherent relationship to their professional and career choices. In addition, weekly presentations will be given regarding specific media, contrasting traditional explorations with the current expectations. The shifting and changing boundaries between two-, three- and four-dimensional work will be explored through the work of contemporary artists, designers and craftspeople. **Credit 1**

**2013-206 Creative Sources**  
The speakers for the winter quarter will be working professionals in various fields. They have been asked to share their experiences regarding the media with which they create the discipline in which they work and their own personal careers. In addition, weekly presentations will be given regarding specific media, contrasting traditional explorations with current expectations. The shifting and changing boundaries between two-, three- and four-dimensional work will be explored through the work of contemporary artists, designers and craftspeople. **Credit 1**

**2013-207 Creative Sources**  
The speakers for the spring quarter will be working professionals in various fields. This quarter, speakers have been asked to share their experiences of working with others in the creation of work. In addition, weekly presentations will be given involving collaborative working experiences and processes within the larger art field. The necessity and opportunity of working with others work will be explored through the work of contemporary artists, designers and craftspeople. **Credit 1**

**2013-211 Drawing**  
An introduction to the visualization of form, thought and expression through the drawing process. The study of line and value as they relate to drawing. Gesture, contour, plane and the motive qualities of line are studied using linear applications of a variety of black and white drawing media. Line is also used to organize and structure drawings and to create value and texture. One-, two- and three-point perspective is included in the study of line. The study of value includes ways to create value and how it can be used to describe volume, texture, plane change, weight and space. Subjects include the human figure, skeletal anatomy, man-made and natural forms and perspective. Media will include charcoal, conte, graphite and ink. Class assignments focus on concept development, and critiques of work help students to better evaluate their own work and the work of others while learning a vocabulary related to drawing. **Credit 3**

**2013-212 Drawing**  
More advanced study of line and value introduced in 2013-211 and an introduction to color. Subjects include the human figure and portrait, man-made and natural forms and perspective. Media will include charcoal, conte, graphite, ink, pastel and color pencil. Class assignments focus on concept development, and critiques of work help students to better evaluate their own work and the work of others while learning a vocabulary related to drawing. **Credit 3**

**2013-213 Drawing**  
The study of color as it relates to drawing using both linear and broad color media. This will include an analysis of the qualities of color, temperature, intensity and value and the study of various color schemes. Color will be used to depict volume, space and weight and in symbolic and expressive ways. Subjects will include the human figure, man-made and natural forms and landscape. Media will include pastel, color pencil and paint. Class assignments focus on concept development, and critiques of work help students to better evaluate their own work and the work of others while learning a vocabulary related to drawing. **Credit 3**

**2013-215 Vector Imaging**  
This course is an introduction to Adobe Illustrator. It provides the necessary skills and vocabulary to further develop the technical skills associated with vector imaging. Numerous exercises of a basic nature will be given with personal critiques following the completion of each exercise. **Credit 1**

**2013-216 Raster Imaging**  
This course is an introduction to Adobe Photoshop. It provides necessary skills and vocabulary to further develop the technical skills associated with raster imaging. Numerous exercises of a basic nature will be given with personal critiques following the completion of each exercise. (Portfolio acceptance) **Credit 1**

**2013-231 2-D Design**  
The two-dimensional design course is a structured, cumulative introduction to the basic elements of design. Organized to create a broad introductory experience, the course focuses on the development of both visual and verbal vocabulary as a means of exploring, developing and understanding two-dimensional compositions. Visual comprehension and the ability to organize perceptions are key foundational components to the development of problem-solving skills. The fall quarter of 2-D Design is an introduction to the analysis of visual imagery and the basics of pictorial construction. The principles of organization and relationship are explored through dialogue, experimentation and the use of a variety of achromatic media. Concepts are introduced through lectures, discussions, demonstrations, research, assigned projects and critiques. **Credit 3**

**2013-232** **2-D Design**  
The winter quarter of two-dimensional design is a continued exploration of the elements and principles of design. This quarter focuses on color theory and application and increasingly complex methods of pictorial organization. Concepts are introduced through lectures, discussions, demonstrations, research, assigned projects and critiques. **Credit 3**

**2013-233** **2-D Design**  
The spring quarter of two-dimensional design focuses on the application of the elements, principles and methods of organization explored during the previous two quarters. Historical, cultural and content-driven issues and themes are explored through a variety of media. Concepts are introduced through lectures, discussions, demonstrations, research, assigned projects and critiques. **Credit 3**

**2013-241** **3-D Design**  
Structured assignments develop skills in concept generation, basic form making and craftsmanship. The sequence has an ongoing concern with the issues of idea fluency, content, appropriate execution and presentation. A fee for expendable materials is required. **Credit 3**

**2013-242** **3-D Design**  
Explores wood as a common medium, the tools and methods for processing and manipulating it. **Credit 3**

**2013-243** **3-D Design**  
Explores plaster as a common medium, the tools and methods for processing and manipulating. **Credit 3**

## Art History

**2039-225, 226, 227** **Survey of Western Art and Architecture**  
The subject of this course is the history of Western art and architecture, from prehistoric times to circa 1950. We will examine the form, style, function and meaning of important monuments of the past and consider these in their historical and cultural context. We will approach these objects in chronological order, for students first need to learn when, where and by whom (whether a people or a known individual) a given object was produced before they can attempt to determine why the object was made, what it meant in its time and place (as opposed to what it may mean to us today), and whose ideology it served. Once we know how to classify visual information, we may be able to make historical sense of the surviving evidence. **Credit 3**

**2039-300** **History of Design**  
Explores the historical precedents of two- and three-dimensional design, including fine arts, industrial, graphic and environmental design. The course provides a foundation for individual decisions on planning and design to complement and enhance present and future environments. **Credit 3**

**2039-306** **Architecture, Interiors and Furniture History I**  
This course surveys architecture, interiors and furniture design from the ancient world through the end of the Renaissance. The course will also discuss the social and technological contexts in which different architectural, interior and furniture styles developed. (2039-225, 226 and 227) **Credit 3**

**2039-307** **Architecture, Interiors and Furniture History II**  
This course surveys architecture, interiors and furniture design from Baroque Italy through the end of the 19th century. The course will also discuss the social and technological contexts in which different architectural, interior and furniture styles developed. (2039-225, 226, and 227) **Credit 3**

**2039-308** **Architecture, Interiors and Furniture History III**  
This course surveys architecture, interiors and furniture design from the late 19th century to the present day. The course will also discuss the social and technological contexts in which different architectural, interior and furniture styles developed. (2039-225, 226, and 227) **Credit 3**

**2039-310** **History of Crafts**  
Explores creative thinking and designing in the area of crafts through the ages with special emphasis on clay, fibers, glass, metal and wood. The course highlights the artistic achievements of the craftspeople of the past to enable present students to view their own time in its historical perspective and thereby understand more thoroughly their creative heritage and the efforts of contemporary craftspeople. **Credit 3**

**2039-315** **Pre-Colombian Art**  
This survey course examines the development of principle styles of Ancient American architecture, sculpture, painting and ceramics up to the 16th century when the Spanish conquistadores defeated the Aztec empire in Mexico and the Inca Empire in Peru and imposed colonial rule. **Credit 3**

**2039-320** **History of Art Criticism**  
Art criticism from the Renaissance to the present day. A study of what makes art "good" (philosophical theories of art and the aesthetic experience) and what art criticism is and does (types and principles of art criticism). Lectures, reading assignments and research papers. **Credit 3**

**2039-330** **Philosophy in Art**  
Traces the interactions between philosophic thought and artistic styles throughout history. Explores art as a reflection of human values. Lectures, reading assignments and research papers. **Credit 3**

**2039-335** **15th Century Art and Architecture in Florence and Rome**  
Significant 15th century commissions for painting, sculpture and architecture in Florence and Rome will be studied. Questions for consideration will include: the nature and meaning of the Italian Renaissance; developments in artistic theory and practice; the importance of antique and medieval precedents; increasing attention to the effects of nature; the rising status of the artist; the role of the patron, and the relevance of documents, literary sources and visual precedents for our interpretation of images. (2039-225, 226, and 227) **Credit 3**

**2039-340** **Symbols and Symbol Making**  
A concentrated study of the nature of sign and symbol as visual metaphor paralleling legend, myth, folklore and fairy tale as verbal metaphor; analysis of Freudian and Jungian theories about symbolic/metaphoric communication; and application of the theories to contemporary examples. Designed to help the artist, designer and craftsperson produce more effective visual communication. **Credit 3**

**2039-345** **16th Century Art and Architecture in Florence and Rome**  
Significant 16th century commissions for painting, sculpture and architecture in Florence and Rome will be studied. Questions for consideration will include: the nature and meaning of the Italian Renaissance; developments in artistic theory and practice; the importance of antique and medieval precedents; increasing attention to the effects of nature; the rising status of the artist; the role of the patron, and the relevance of documents, literary sources and visual precedents for our interpretation of images. (2039-225, 226, and 227) **Credit 3**

**2039-355** **Latin American Art**  
This is a survey course of the historical development of art from colonial times to the present. Included will be a consideration of painting, sculpture, architecture, graphic and photographic arts. Potential themes to be addressed include the dependence on the European neo-classical academic model; indigenism, nationalism, and the resurgence of "popular" art; the role of the visual arts in the construction of history; the conflicts and tensions involved in the search for a cultural identity. **Credit 3**

**2039-360** **18th and 19th Century Art**  
The development of the arts in these two centuries in the areas of Western painting, printmaking, sculpture, architecture and the crafts from 1700 to 1900. Lectures, reading assignments and research papers. **Credit 3**

**2039-365** **20th Century Art (1900-1950)**  
A critical study of the art and visual culture of the first five decades of the 20th century. Major stylistic movements in Europe and America will be examined with special attention to innovations in materials, subject matter, and philosophy. Central themes include: the relationship between art and politics; abstraction vs. figuration; primitivism and the search for origins; reactions to modernity and the rise of technology; the tension between the avant-garde and popular culture; the institutional critique, and the special role of art and artists in modern society. (2039-225, 226, and 227 or permission of instructor) **Credit 3**

- 2039-368** **Scandinavian Modernism**  
This course examines the decorative arts and visual culture of modern Scandinavia from 1860 to the present, with special emphasis on the social, economic and political impulses that have shaped them. Scandinavian modern design plays a significant role in the postwar epoch; it is equated with such leading brands as Volvo, Saab, Ericsson, Nokia, H&M, Electrolux, Orrefors, Georg Jensen, Artek and IKEA. The myths and realities of its success will be examined as well as its impact on contemporary design. (2039-225, 226, and 227 or permission of instructor) **Credit 3**
- 2039-375** **20th Century Art Since 1950**  
A critical study of the art and visual culture of the second half of the 20th century. Major stylistic movements in Europe and America will be examined with special attention to innovations in materials, subject matter and philosophy. Central themes include: abstract expressionism, pop art, nouveau realism and arte povera; earthworks; site specificity; allegory; conceptualism; minimalism; feminism; performance; and new media. (2039-225, 226, and 227 or permission of instructor) **Credit 3**
- 2039-376** **Renaissance Painting in Flanders**  
The history of Renaissance painting in the Southern Netherlands from the beginning of the 15th century to the end of the 16th century. We will consider the meaning of the Renaissance in Flanders, the observation and recording of natural appearances, "hidden symbolism" and sacramental themes in Early Netherlandish painting, the connections between Flemish, German and Italian art, the development of new genres in the 16th century, "originality" and "artistic progress." Lectures, reading assignments and research papers. **Credit 3**
- 2039-385** **Installation Art**  
This course will introduce students to historic, contemporary and critical issues surrounding installation art. There will be an introduction to the development of installation art as a genre. We will examine the changes, which have developed over the past three decades from object sculpture to non-object. There will be an emphasis on the development of the concept of an installation project and its relationship to site and/or audience. Both public and gallery spaces will be discussed. (2039-225, 226, and 227 and 2039-365) **Credit 3**
- 2039-390** **Native American Art and Culture**  
Survey of Native American visual arts within the context of Native American cultures and within a historical and anthropological framework. Native American arts, their roots, traditional expression, changes with European contact and contemporary expressions are examined by culture area. Consideration also is given to materials used, techniques of construction, individual and tribal styles as well as to the meaning and function of various art forms within Native American societies. **Credit 3**
- 2039-395** **Theory and Criticism of 20th Century Art**  
A critical study of theoretical and philosophical texts that ground 20th century art as well as their impact on artists and art historians/critics. Major issues include: the theory of autonomy and self-reflexivity; the structuralist paradigm; poststructuralist and Marxist critiques of modernism; feminist approaches to spectacle, spectatorship, and commodity fetishism, and the relation of vision to constructions of identity and power. Key authors to be discussed include Lessing, Kant, Foucault, Barthes, Benjamin, Saussure, Pierce, Levi-Strauss, Lacan, Bataille, Lyotard, and Baudrillard. (2039-225, 226, and 227 and 2039-365 or 2039-375 or permission of instructor) **Credit 3**
- 2039-410** **The Art of Art History**  
This course will trace the history of how we look and write about those things that western culture calls "art." The course will concentrate, in a loosely chronological manner, on the development of art history and criticism from its roots in 18th century Germany to a multiplicity of viewpoints of the late 20th century. This inquiry will examine the people behind a tradition within the literature of the visual arts that not only re-examined the same issues but also challenged, expanded and elaborated on one another's work. The course will show art history and our conception of art as something that is always under revision and is always in flux. (2039-225, 226, and 227 and a non-20th century art history elective) **Credit 3**
- 2039-415** **Thinking About Making: The Practice of Art in a Global Society**  
A discussion based art history elective for upper level undergraduates. The course seeks to bridge the gap between studio practice and contemporary art history. The course will explore very current work and ask questions about what is art, who is the audience, what is "our" art making practice and how does that fit within the larger context of the current state of the global art world. How do we measure success and artistic failure? The course emphasizes observation, critical analysis, and written interpretation. (2039-225, 226, 227 or instructor permission) **Credit 3**
- 2039-425** **Public Art/Public Space**  
This course will introduce students to the contemporary and critical issues surrounding public art. There will be an introduction to the history of public art. We will examine the changes from public art as monument to public art as place. There will be an emphasis on the new genre of public art, which involves community and historical referencing of site. The debate over public funding for public art will also be discussed; as the question of "whose art is it" has become a pivotal issue in defining public art for public places. (2039-225, 226, 227 and 2039-365) **Credit 3**
- 2039-430** **Dada and Surrealism**  
Explores the Dada and Surrealist movements in Europe and the United States from 1916 through 1968. Emphasis is on identifying the major works of artists involved in these aesthetic developments. Ideology and formal ideas are analyzed in lectures, reading assignments and research papers. **Credit 3**
- 2039-433** **What Is Postmodernism?**  
This course will cover the art, politics, culture and critical texts that formed the discourses, and their resulting debates, about contemporary society after World War II and especially after the social unrest of 1968. The course, "What Is Postmodernism?," features the question itself. How and why, and by whom, are questions asked and answered? What if the question were to be asked from within the discourse of architecture or music or biology? Would the answers be the same? Would the questions be the same? (Contemporary Art) **Credit 3**
- 2039-435** **Art of the Last Decade**  
A critical study of the art and visual culture of the last decade with a strong emphasis on the American and international scene. The primary focus will be on living artists and artists who remain crucial to contemporary debates with special attention paid to recent, current and forthcoming exhibitions, their methodological frameworks and historical context, as well as the key critics and curators who are shaping the visual culture of the present. (2039-225, 226, 227 and 2039-365 or 2039-375 or permission of instructor) **Credit 3**
- 2039-438** **Body in Art**  
This course is an inquiry into the artistic investigation of the literal human body and the texts that give it meaning. The class will focus on the history, theory and problems of performance art in the latter part of the 20th century. (2039-225, 226, and 227) **Credit 3**
- 2039-440** **Conceptual Art**  
This course examines the widely influential mid-1960s art movement that questioned the fundamental nature of art itself by renouncing the material art object as well as the phenomenon of art making. The definition of art as well as its institutional framework was thereby expanded, and the idea, concept or intellectual dimension of the work was underscored. Students will be acquainted with the philosophical foundations and critical implications of this global movement across a wide spectrum of works and practices (paintings, performance, installations, books and texts, photography, film and video) and its relevance to contemporary concerns. **Credit 3**
- 2039-443** **Art and Technology: From the Machine Aesthetic to the Cyborg Age**  
This course explores the links between art and technology in 20th century visual culture with a special focus on historical, theoretical and ideological implications. Examples from film (*Modern Times*, *Metropolis*, *Man with the Movie Camera*, *Blade Runner*) and literature (*Frankenstein*) will be discussed as well as a wide range of artists and philosophers. Topics include the industrial revolution; utopian, dystopian and fascist appropriations of the machine; the machine aesthetic (of Leger and Le Corbusier), engendering the body and machine eroticism; the principles of scientific management, mass production and the art factory; the technological sublime, Rauschenberg and E.A.T., cyborgs, cyberpunk and the posthuman. (2039-225, 226, and 227 or permission of instructor) **Credit 3**
- 2039-452** **Art and Activism**  
This course will focus on artists using their work for the purpose of changing society. Students will consider work by both individual artists and artists working in groups that cause critics, art historians, other artists and the viewing public to ask if what they are doing is art. Although there will be forays back to the 19th and early 20th centuries, most of the time will be dedicated to artists of the last three decades. We will examine texts that propose art to be a form of activism and persuade artists to be responsible for the way they represent the world and maybe even determine if the goal of art is not to represent it in the first place. The artists we discuss are concerned with problems in our society that affect gender, race, sexuality, poverty, labor issues and the environment. (2039-225, 226, and 227) **Credit 3**

**2039-459** **Art and Architecture in Central Italy: 1**  
The subject of this course is painting, sculpture and architecture in Central Italy from the middle of the 13th century to the end of the 14th century. We will approach this material in more or less chronological order as we focus upon different types and media, including the altarpiece, the private devotional image, the pulpit, the tomb, the chapel, the monastic church, the cathedral, the town hall, the private palace and the urban setting. Questions for consideration will include: Franciscan devotion, the rivalry between Sienna and Florence, early humanist thinking about the arts, Giotto as the paradigmatic Florentine painter, the nature and meaning of the Italian proto-Renaissance, and the impact of the Black Death upon the arts. (2039-225, 226, and 227) **Credit 3**

**2039-469** **Baroque Rome**  
This course will focus upon Italian artists working in Rome from circa 1590 to circa 1660. Although we will explore painting, sculpture and architecture in this sequence and more or less chronologically, we will often have the chance to consider how these different media coalesce to create an overwhelming visual experience. We will pay particular attention to major commissions given to Annibale Carracci, Michelangelo da Caravaggio, Gianlorenzo Bernini, and Francesco Borromini as we seek to define the nature and meaning of the Roman Baroque. (2039-225, 226, and 227) **Credit 3**

**2039-550, 551, 552, 553** **Special Topics**  
A focused, in-depth study and analysis of a selected advanced topic in art history. Specific topics vary according to faculty assigned. **Credit variable 3-6**

### **Art and Design Extended Studies**

**2012-201** **Basic Design I**  
Study of basic elements in design: line, form and shape, focusing upon their application to design principles. Assignments address problem solving that produces two- and three-dimensional design solutions. **Credit 2 per quarter**

**2012-202** **Basic Design II**  
Study of basic elements in design: texture, color, space and their incorporation in design principles as applied to two- and three-dimensional design problems. (2012-201) **Credit 2 per quarter**

**2012-203** **Basic Design III**  
Study of basic elements in design, primarily color. Rhythm, repetition, movement and spatial concerns are explored in color design problems that produce effective two- and three-dimensional solutions. (2012-201 and 202) **Credit 2 per quarter**

**2012-211** **Basic Drawing and Media I**  
An in-depth study of the fundamentals of drawing using an assortment of appropriate media. Drawings focus on the application and understanding of line, shape and value, from simple objects to more complex compositions. A variety of black-and-white media will be explored. Emphasis is on problems confronting the student who has had little or no drawing experience. **Credit 2 per quarter**

**2012-212** **Basic Drawing Media II**  
Intermediate in-depth study of drawing that emphasizes an exploration of color media for visual problem solving. Projects range from simple still-life studies to complex compositions. Effective composition is addressed through critique and discussion. These exercises in academic and creative drawing approaches are designed for the student who has had little or no drawing experience. (2012-211) **Credit 2 per quarter**

**2012-213** **Basic Drawing Media III**  
Advanced in-depth study of drawing fundamentals emphasizes an exploration of both wet and dry media (pencil, charcoal, conte crayon, pastels, water-color). Projects include portrait studies and drawing from the human figure. Class assignments emphasize skill building for the student who has had little or no drawing experience. (2012-211 and 212) **Credit 2 per quarter**

**2012-215** **Basic Figure Drawing**  
Introductory study of the structural elements needed to visualize human form. Life models and still-life props provide the studio setting for creating drawing compositions that are both concept-based as well as expressive. (2012-211, 212, and 213 or equivalent) **Credit 2 per quarter**

**2012-217** **Color Theory in Art**  
Opportunity to develop awareness and sensitivity to a range of color conditions that emphasizes the visual impact of color when applied to traditional and digital art problem solving. (2012-201, 2012-202 and 2012-203, or equivalent) **Credit 2 per quarter**

**2012-220** **Collage**  
A basic study of the history, materials and techniques used in collage. Students explore a variety of materials used by past and contemporary artists and then apply these techniques to develop their own artwork. May be elected more than once for credit. (2012-201, 202, 203 and 2012-211, 212, 213 or equivalent) **Credit 2 per quarter**

**2012-221** **Advanced Drawing**  
Contemporary drawing course that introduces drawing concepts, alternative media and unconventional tools for creating expressive drawings. Creative drawing approaches include collaged content, textured surfaces, and dimensional compositions. May be elected more than once for credit. (2012-201, 202, 203 and 2012-211, 212, 213 or equivalent) **Credit 2 per quarter**

**2012-225** **Figure Drawing**  
Continued study of figurative drawing that builds on learning acquired in a basic figure-drawing course. Nude and costumed models as well as skeletons provide students the opportunity to strengthen their basic drawing skills. Varied drawing approaches, techniques, media and concepts will be introduced. Maybe be elected more than once for credit. (2012-215) **Credit 2 per quarter**

**2012-229** **Portfolio Preparation Workshop**  
A college-level experience for students seeking a portfolio for acceptance into professional art and design schools. Students will build expressive portfolios, strengthen an existing portfolio and produce portfolio submissions that reflect a personal direction. Using a wide range of media and technology, a creative competence will be evidenced through expressive solutions. Concept building, presentation, documentation and finished artwork are class dialogues that accompany the studio imaging assignments. May be elected more than once for credit. **Credit 2 per quarter**

**2012-274** **Illustration**  
Research into the fundamentals of visualization and pictorial organization in advertising and editorial illustration. Contemporary graphics procedures, including digital techniques and adaptations, will be presented through discussion and studio projects. (2012-215) **Credit 2 per quarter**

**2012-276** **Calligraphy**  
The foundational or italic form of lettering will be used to guide students in an exploration of the history, theory and techniques that have shaped letterforms as we know them today. Emphasis is on developing skills and knowledge by studying historic and contemporary forms as well as through the use of a variety of tools and materials. Areas of study include majuscules, rhythm, spacing, techniques, media, color, design, page layout, and either the mechanics of bookbinding or camera-ready art. **Credit 2 per quarter**

**2012-277** **Cartooning**  
Various cartooning styles are examined in order to identify and discuss the factors that make cartoons appealing and effective. The focus of the course is the study and practice of cartoon illustration principles. The importance of obtaining good reference materials and maintaining a file of other cartoon art are stressed. Students complete weekly drawing assignments that cover elements of cartooning and building complexity in the work, culminating in the completion of several finished cartoon pieces. (2012-201, 202, 203 and 2012-211, 212, 213) **Credit 2 per quarter**

**2012-278** **Interpretive Landscape Drawing**  
Students will sketch directly from nature on location during field trips. In subsequent studio sessions, compositions translating first impressions using various methods are then developed. Special attention is given to individual approaches and expression. **Credit 2 per quarter**

**2012-279** **Human Anatomy for Artists**  
Students learn to identify and define the bones and muscles that affect the surface of the human anatomy. The instructor demonstrates how to draw these structures in simplified shapes and forms. The students then apply this information to figure drawing in the studio. **Credit 2 per quarter**

**2012-284** **Airbrush Techniques**  
Beginners develop the basic skills and techniques of painting with an airbrush, while experienced airbrushers concentrate on enhancing their skills. Graphic artists, illustrators and photographers can benefit from this exposure to airbrush techniques and applications through demonstration and experiential learning. Class is limited to 10 students. (2012-201, 202, 203 and 2012-211, 212, 213) **Credit 3 per quarter**

**2012-286** **Introduction to Painting**  
Study of the materials and techniques of painting through use of still life and nature forms. The basic skill development acquired in this class will become the foundation for more advanced painting options. (2012-201, 202, 203 and 2012-211, 212, 213, or equivalent) **Credit 2 per quarter**

**2012-288** **Painting**  
Painting with opportunities for gifted or advanced students to explore media, seek new skills and develop a new style of expression. The instructor will work individually with each student so that a personal direction can be identified and built. Models are available on an infrequent basis. Still life and sketches are used for inspiration and reference. This course may be elected more than once for credit. (2012-286 or equivalent) **Credit 2 per quarter**

**2012-291** **Figure Painting**  
Students will paint from costumed and nude models. Achieving a clear understanding of the various media and how they may be used is a primary focus. Artistic concepts will be investigated and selected for appropriate expressive search. Action, structure, gesture, composition and the development of experimental techniques will be explored. (2012-225 or equivalent) **Credit 2 per quarter**

**2012-292** **Portrait Painting**  
Attention to developing anatomical description will be balanced by encouragement to produce expressive work reflective of individual artistic direction. Emphasis is on understanding various aesthetic traditions. Portraiture painting skills will be gained through studio painting, problem solving, demonstrations, discussions and critiques. This course may be elected more than once for credit. (2012-215 or equivalent) **Credit 2 per quarter**

**2012-293** **Watercolor Painting**  
Students will receive individual and group instruction in basic watercolor methods, media and tools. The painting sessions will emphasize composition, color and personal expression as they relate to watercolor, gouache and casein media. This course may be elected more than once for credit. (2012-211, 212, 213 or equivalent) **Credit 2 per quarter**

**2012-296** **Introduction to Nontoxic Printmaking**  
Students will investigate the methods, materials, tools and techniques used by contemporary printmakers. Print processes introduced include woodcut, etching, engraving, stencil/chine-collé, collagraphs, carborundum, monotypes and image-on intaglio types. Students are required to pull an edition of prints in one medium. (2012-211, 212, 213, or equivalent) **Credit 2 per quarter**

**2012-376** **Calligraphy Workshop**  
Students will continue to study the methods and techniques of calligraphy. Studying a variety of styles and letterforms enriches the artwork assignments produced by the advanced level calligrapher. Personal direction and special project work are encouraged. (2012-276) **Credit 2 per quarter**

**2012-377** **Advanced Cartooning**  
This course builds upon the foundation established in Cartooning. The value of gesture drawing is stressed, and an exploration of the many cartoon elements is researched. Freelancing pros and cons, along with client-vendor relationships, are the subjects of ongoing discussions. Specific assignments are more comprehensive in content for the advanced sessions. Color, media options, composition, layout and attention to detail are key considerations in producing the final artwork. (2012-277) **Credit 2 per quarter**

**2012-396** **Printmaking Studio**  
Further study of methods and techniques of contemporary printmaking provide an in-depth appreciation of etching, lithography, relief printing and intaglio type processes. Students may concentrate in one print medium. This course may be elected more than once for credit. (2012-296) **Credit 2 per quarter**

## School of Art

### Illustration

**Prerequisite for all 300-level illustration courses:**  
foundation program or equivalent

**2019-301** **Illustration I**  
Illustration core for illustration majors and medical illustration majors in their sophomore year. The students approach major elements of technique, application and theory in relation to becoming illustrators. Studio sessions involve basic anatomy, design and typography for illustrator, figurative expression, photographic tools and illustrative technique. Class structure allows demonstrations of process and experimentation and critique with illustrative media. **Credit 3**

**2019-304** **Anatomical Figure Drawing**  
Helps students correlate underlying osseous and muscular anatomy with surface form and structure. Instruction also emphasizes gesture, proportion and balance. Course work requires students to use their figure drawing skills while solving illustration assignments. **Credit 3**

**2019-311** **Digital Illustration I**  
Provides students with methods of conceptualizing, organizing and executing illustrations using the computer. Projects will expose students to various types of digital techniques using vector- and raster-based software applications as well as a variety of input and output devices for the creation of professional level assignments. The course will emphasize conceptual problem-solving methodology and the language of visualization while providing a consistent foundation for digital illustration as it relates to professional illustration production. Color systems, digital terminology and pre-press file formats also will be covered. **Credit 3**

**2019-323** **Zoological and Botanical Art and Illustration**  
This course utilizes resources found in the natural world as subjects for applied art and design. Students work at accurately portraying animal and plant images, which may be used descriptively in print or electronic media. (Foundations) **Credit 3**

**2019-342** **Digital Narrative I**  
Instructs students in the use of digital medium for the purpose of visual storytelling. The importance of the creation of visual narratives with reference to style, content and interpretation will be stressed. Assignments will involve vector- and raster-based software applications and a variety of input and output devices. Conceptual strategies, production methodologies, narrative composition and color systems also will be covered. (2019-311) **Credit 3**

**2019-345** **Illustration Techniques I**  
This course will address the wide array of dry media production techniques. Stress will be placed on developing and enhancing drawing skills, appropriate use of media, artist, created photographic reference materials, and use of a structured illustration working process. Further emphasis will be placed on creative thinking, a preliminary view of professional practices and improvement of student portfolios. (Art and design foundation courses) **Credit 3**

**2019-361** **Dimensional Illustration I**  
Introduces students to an alternative, three-dimensional style of illustration. Emphasis will be on planning, preparation, compositional elements in three-dimensional sculptural form and creative problem solving. Students will be encouraged to explore a variety of materials and techniques to complete projects. (Art and design foundation courses) **Credit 3**

**2019-363** **Digital Mixed Media I**  
Provides students with the opportunity to explore the creative potential presented through the imaginative combination of both traditional and digital media. Students will be expected to utilize and combine skills learned in traditional and digital illustration courses to provide exciting and fresh illustrations unrestricted by a singular medium. (Art and design foundation courses) **Credit 3**

**2019-373** **Character Illustration I**  
Instructs students in the conceptualization and production of illustrated characters. Assignments will challenge students to create characters for a variety of purposes and media. Anatomy, design and style will take final form as frontal, rear, profile and  $\frac{3}{4}$  view representations of characters. Conceptual strategies will be stressed as they relate to character appearance and function. Assignments will involve production methodologies, character diagramming and color systems. (2019-301 or 2019-311) **Credit 3**

**Prerequisite for all 400-level illustration courses:  
sophomore illustration core or equivalent**

**2019-406 Illustrative Design I**  
The goal of this course is to familiarize students with professional illustration assignments and the integration of typography, symbols and other forms of graphic visuals. Assignments will include book and magazine covers, advertisements and posters; i.e., visuals that, although produced by illustrators, effectively function as total design solutions. The ability to interpret typographic and other non-illustrative components in an illustrative context has become a key to potential employment in our profession. In today's market many career tracks demand that illustrators know how to develop these total solution assignments. **Credit 3**

**2019-409 Symbols in Editorial Illustration**  
An in-depth introduction to the field of editorial illustration. Emphasis is on brainstorming and concepts. Cultural images and symbols are examined and utilized to express ideas. Students are encouraged to expand in a personal direction while effectively communicating specific information from a given article or story. Efficient and effective time and energy priorities are established. **Credit 3**

**2019-422 Digital Illustration II**  
Provides students with advanced methods of conceptualizing, organizing and executing illustrations using the computer. Through the use of methodology worksheets, the course will emphasize problem-solving methods while building on a consistent foundation for digital illustration preparation and production. Projects will allow students to explore advanced digital illustration techniques using vector- and raster-based software applications as well as a variety of input and output devices. Alternative color systems, output paper surfaces and pre-press file formats also will be covered. **Credit 3**

**2019-423 Digital Editorial I**  
This course emphasizes effectively communicating information in a given article or story, from political themes and news stories to plays and poetry. Students explore the computer's ability to make many variations and subtle changes to the images quickly. **Credit 3**

**2019-427 Pop-up Books I**  
This course will deal with constructing and illustrating pop-up and mechanical books. Students will study painting, engineering and illustration for production of pop-ups. The course will be divided into a preliminary section of learning the basic mechanism of pop-up books and a second section that allows students to apply knowledge learned in the first section to the illustration and production of their own book. **Credit 3**

**2019-432 Digital Editorial II**  
Expands on the principles learned in Digital Editorial I. The importance of the advanced conceptual interpretation of editorial subject matter; organization of the composition; and the interjection of humorous, serious, ironic and other interpretations will be stressed. Students will apply approaches to creative illustration while closely following reproduction specifications. Students may use vector- and raster-based software applications and a variety of input and output devices. Stylistic issues, conceptual strategies, production restrictions and color systems also will be covered. (2019-423) **Credit 3**

**2019-436 Illustrative Design II**  
Applies the principles and methods practiced in Illustrative Design I in more advanced projects. Students will conceptualize, organize and execute illustrations within a design context and explore basic headline writing with an emphasis on the use of complex graphic elements in conjunction with various styles of illustrations. Illustration production methods and terminology will be included. Projects will expose students to various real-world print media assignments that will demand the use of traditional illustration methods as well as computer-based production media. Assignments will stress solutions that are typically managed by art directors and designers. (2019-406) **Credit 3**

**2019-442 Digital Narrative II**  
Expands on the tradition of verbal concepts to pictorial narrative introduced in Digital Narrative I. Of particular emphasis will be illustration sequences, including story-line illustration and thematic series pictorials, and the digital representation of narrative story telling with reference to style, content and interpretation. Assignments will involve vector- and raster-based software applications and a variety of input and output devices. Conceptual strategies, production methodologies, narrative composition and color systems also will be covered. (2019-342) **Credit 3**

**2019-445 Illustration Techniques II**  
This course will address the wide array of wet media production techniques. Stress will be on enhancing drawing skills, appropriate use of wet media, artist, created photographic reference materials and refining a structured illustration working process. Further emphasis will be on creative concept development, verbal communication, professional practices and improvement of student portfolios. (2019-345) **Credit 3**

**2019-461 Dimensional Illustration II**  
This course will offer students the option to continue an exploration of three-dimensional illustration. Emphasis is on drawing skills, planning, preparation, compositional elements of three-dimensional sculptural form, and creative problem solving. Students are encouraged to explore a single medium to complete projects in a series to be presented in a consistent style. (2019-361) **Credit 3**

**Prerequisite for all 500-level illustration courses:  
junior illustration core or equivalent**

**2019-504 Illustration as a Journalist I**  
The course topic is illustration problems that require the student to visually report and record a specific happening or event. These projects will be of longer duration and will consist of several major paintings, many drawings, sketches, notes and photo references. This journalistic approach to illustration demands that the students attend the event and select those images that will best communicate the atmosphere of the event. Students are encouraged to sharpen their observations in order to clarify or embellish what might be commonplace to the non-visual observer. **Credit 3**

**2019-505 Contemporary History Illustration**  
Students are introduced to a sequence of historical events that have had the most lasting effect on 20th century illustration. These events affect the look of illustration and provide a place to begin discussion. The effects on surrealism, on the one hand, and social realism, on the other, represent a swing of the pendulum of narrative and representational art. Studio work incorporates ideas embodied in these and other contemporary art trends. Lectures and illustrated talks compare contemporary art and illustration history. **Credit 3**

**2019-507 Illustration for Books**  
Explores the basic principles in developing illustrations for books. Composition, conceptualization and storyboard development are covered as well as finishing art preparation. Emphasis is not only on creativity of expression but also on conceptual and technical experimentation. Work is geared toward books for a variety of age groups and functions. **Credit 3**

**2019-510 Personal Focus I**  
A series of illustration projects in which students are encouraged to investigate topical subjects of their choice. Each student's creativity, self-expression and visual communication skills are stressed. Emphasis is on clarity of concepts and developmental procedures necessary to work as an illustrator. **Credit 3**

**2019-513 Marketing and Business Practices for Illustration**  
This course will address the professional practices and issues involved in conducting the business of illustration as related to both freelance and staff positions. Students will consider setting up a business/studio, marketing their work, self-promotion, finding work, pricing, record keeping, legal rights, taxation and representation. (Junior illustration core) **Credit 3**

**2019-516 Animating Digital Illustration**  
An introduction to illustrating for multimedia projects by creating computer-generated animations and presentations. Macromedia Director, in combination with other imaging software, will be used to develop these "movies." The Director movies will investigate not only illustrated animation but also sound, music, color and special effects. **Credit 3**

**2019-517 The Interactive Illustration**  
Projects will highlight the integration of interactive interfaces into illustrated Macromedia movies, thus allowing responses to choices made by the user. Using scripting and branching, in combination with buttons and menu choices, projects will be programmed to allow some control over a movie and navigation through animations and presentations. **Credit 3**



**2019-518** **Time-Based Illustration and Design**  
Illustration and design students will be teamed to develop multimedia projects; i.e., CD-ROMS, animated advertisements and kiosk displays. The teams will begin with short problems, culminating in final full-scale electronic projects that utilize their respective illustrative and design skills to develop strong, unified solutions. Both passive and interactive projects will be included which reinforce students' knowledge of time-based authoring tools such as Macromedia Director, QuickTime Movies and Adobe Premiere. **Credit 3**

**2019-527** **Pop-up Books II**  
This continuation of Pop-Up Books I will deal with constructing and illustrating pop-up and mechanical books. Students will select a singular topic and produce pop-ups and other mechanical devices relevant to telling the story. Emphasis will be on creating multiple devices relying on a single source of energy per page for performance. Emphasis will also be placed on visual continuity throughout the story. (2019-427) **Credit 3**

**2019-563** **Illustration Portfolio Preparation**  
This is the final preparatory course for the illustration major. Its purpose is to provide students with information, strategies and guided instruction to organize and create their final portfolio. The course will include individual critique and analysis of work created in earlier studio classes and progress to the definition of a career agenda. Projects will be individually assigned based on the quality of each student's body of work and his or her career intentions. Presentation methods, formatting and stylization will also be addressed. The final culminating project will be a finished portfolio document. Students will be instructed in job seeking strategies, including interviewing dynamics, résumé writing and correspondence. **Credit 3**

## Medical Illustration

**Prerequisite for all 400-level medical illustration courses:  
sophomore fine arts core or equivalent**

**2020-215** **Foundation Illustration/Medical Illustration**  
This course provides an introduction to the fields of illustration and medical illustration and the role of these disciplines in the design process. Students develop conceptual skill; experiment with different media; and learn the importance of research, reference materials, models and props in the illustration process. Career options, self-promotion and the professional practice of illustration will also be discussed. **Credit 2**

**2020-406** **Anatomic Drawing I**  
Students are assigned projects to reinforce their knowledge of anatomy while collaborating on dissection and illustration from the cadaver. Problems include oncology from cross sections and x-rays in preparation for surgical and medical/legal art. Mixed media is encouraged. **Credit 3**

**2020-407** **Anatomical Illustration: Wet Media Application**  
Development of range and mastery of medical wet media illustration techniques. Course work emphasizes the transition of anatomical drawing done from dissected cadavers into "instructional anatomical illustrations" designed to be published using halftone and four-color reproduction techniques. **Credit 3**

**2020-408** **Computer Applications for Anatomic Illustration**  
Advanced application of computer hardware and software to create illustrations in support of anatomical instruction. Course work emphasizes translating on-site drawings from student dissections into digital illustrations. **Credit 3**

**2020-409** **Anatomic Drawing II**  
Building on experience gained in Anatomic Drawing I, students are assigned projects to reinforce their knowledge of anatomy while collaborating on dissection and illustration from the cadaver. Problems include oncology from cross sections and x-rays in preparation for surgical and medical/legal art. Mixed media is encouraged. **Credit 3**

**2020-410** **Anatomical Illustration Mixed Media**  
Development of range and mastery of airbrush and mixed media illustration techniques. Course work emphasizes creating illustrations aimed at a variety of medical illustration markets, including medical/legal, editorial and advertising. **Credit 3**

**2020-431** **Human Gross Anatomy I**  
Dissection and the study of the human body are presented with topics such as developmental, comparative and applied anatomy. Emphasis is directed toward osteology and radiographic anatomy. **Credit 4**

**2020-432** **Human Gross Anatomy II**  
The second half of a two-quarter sequence devoted to the study of the human body. Detailed dissection of a human cadaver is supplemented with lectures on the structure and function of the major organ systems. The second quarter begins with a detailed dissection of the head and neck and moves on to the pelvis, perineum and a lower limb. (2020-431) **Credit 4**

**2020-461** **3-D Modeling and Animation of Biomedical and Organic Forms I**  
Course explores modeling and animating three-dimensional forms to provide visual support for allied health instruction. Assignments focus initially on modeling geometric forms to create biomedical subjects (i.e., human cells, bacteria, viruses, etc.). Fundamentals of animation and its use as an instructional media are then presented. Additional modeling techniques and expanded lighting and rendering procedures are explored. Students create animation explaining cellular events or depicting the anatomy of a human organ for their final assignment. **Credit 3**

**2020-462** **3-D Modeling and Animation of Biomedical and Organic Forms II**  
Course employs three-dimensional modeling and animation as a means of providing visual support for biomedical instruction. Assignments focus on constructing models that accurately portray a member of the phylum anthropoda (crustaceans, insects, arachnids). Fundamentals of animation and its use as an instructional media are reviewed. Models are then attached to "skeletons" in order to animate some characteristic action of the chosen species. Forward kinetics, inverse kinetics and inverse kinetics using a spline handle are compared as means for controlling animation. **Credit 3**

**2020-463** **Advanced 3-D Modeling and Animation of Biomedical and Organic Forms**  
Course for students who have taken either three-dimensional modeling and Animation of Biomedical and Organic Forms I or II to develop animations designed to provide health information as a public service displayed on the Web. Course material focuses on advance modeling and animation procedures. In addition to technical animation and modeling skills, student projects are expected to demonstrate independent research methodologies. **Credit 3**

**2020-468** **Medical Legal Illustration**  
This course deals with the preparation of support materials for medical litigation—personal injury, medical malpractice and product liability cases. Students learn to read and interpret medical records, including operative reports, discharge summaries, radiographs, pathology and autopsy reports. From these records, students propose effective visual aids to best depict the facts of the case, create preliminary sketches of the proposed exhibits and then complete the exhibits in a format appropriate for presentation to a jury or arbitrator. **Credit 3**

**2020-478** **Molecular Illustration**  
Accurate representations of molecular structures are essential to illustrate recent advances in biotechnology, medical genetics and pharmacology. This course provides a basic overview of molecular biology and introduces the principles of molecular illustration. Students will locate three-dimensional molecular model files on the Internet and manipulate these models to create two-dimensional, three-dimensional and animated representations of molecules and biochemical processes. **Credit 3**

**Prerequisite for all 500-level medical illustration courses:  
junior fine arts core or equivalent**

**2020-501** **Advanced Medical Illustration**  
Advanced medical illustration techniques. Graphic design related to illustrative and photographic practice. Lab sessions to be scheduled in operating room facilities. Jointly sponsored by RIT and the University of Rochester. **Credit 3**

**2020-504** **Surgical Drawing and Illustration I**  
This course provides students with the unique opportunity of drawing while observing surgery in local operating suites. Surgical sketches are further developed into final illustrations designed to support instructions. Illustrations created in this course will be produced using traditional and electronic media. **Credit 3**

**2020-505** **Surgical Drawing and Illustration II**  
This course provides students with the unique opportunity of drawing while observing surgery in local operating suites. Surgical sketches are further developed into final illustrations designed to support instruction, editorialize, advertise and support courtroom presentation. Illustrations created in this course will be produced using traditional and electronic media. **Credit 3**

**2020-506 Computer Animation Medical Instruction**  
Advanced study of hardware and software applications to support medical instruction. Course introduces students to creating two-dimensional computer animations as support for biomedical instruction. **Credit 3**

**2020-507 Marketing and Business Practices Medical**  
Course work prepares students for entry into the medical illustration profession. Topics include writing and designing résumés, cover letters and self-promotional materials as instruments for gaining employment. Additional classroom lectures and demonstrations cover professional ethics, copyrights, contracts and client/illustrator negotiations. **Credit 3**

**2020-508 Medical Illustration Portfolio**  
Students receive individual assessments of their current portfolio from faculty. Course work supports construction of “exit” portfolios reflecting each student’s strengths and interests. Traditional two-dimensional and electronic portfolios are constructed. **Credit 3**

### Fine Arts Studio

**Prerequisite for all 300-level courses: foundation program or equivalent**

**2021-305 Introduction to Painting**  
Emphasis is on painting and the development of form, space and expression from a variety of sources, including the human figure. Emphasis on basic techniques, materials and concepts for further study in painting and related media. Introduction to the materials and techniques of permanent painting media. Preparation and execution in both direct and indirect painting methods. Safe handling of artists’ materials is stressed. **Credit 3**

**2021-321 Contemporary Drawing**  
Drawing from the standpoint of being informed, inventive and contemporary in the use of form concepts and relationships. To encourage freedom of thought, imagination and inquiry into theory, technology and the application of drawing as a visual communication. **Credit 3**

**2021-361 Introduction to Sculpture Assemblage**  
This course involves assembling or bringing together parts/pieces to form a whole, one of the most basic approaches to creating sculpture. Spontaneous and immediate contact with unique materials, creative processes and the degree of sculptural impact may all be characterized as extremely direct. This straightforward confrontation offers no flashy techniques, seductive material or process to hide behind. Instead, at the onset, basic sculptural manipulation must occur. **Credit 3**

**2021-362 Introduction to Sculpture Figure**  
This sculpture course investigates the study of human form through the development of sculptured class figures, working directly from living models. Emphasis is on exploring the following sculptural elements: the underlying three-dimensional structure of the human figure; proportions of the human figure; volume, mass and surface anatomy; gesture; support and balance; figurative spatial relationships; expressive qualities of the human form; use and control of basic material and processes related to figure sculpture. **Credit 3**

**2021-381 Watercolor**  
Use and control of the technique of watercolor painting. Exploring watercolor as an illustrative and painting media. **Credit 3**

**Prerequisite for all 400-level courses:  
sophomore fine arts courses or their equivalent**

**2021-401 Fine Arts Studio I**  
The third year of studio work in the degree sequence. Increased development of the various fine arts media. Emphasis is on individual solutions and expression. **Credit 3**

**2021-501 Fine Arts Studio II**  
The fourth year of advanced studio work, completing a major course of study in the fine arts. Concentrated studio production focused on individual creative solutions. Individual and group critiques lead to the development of a visual portfolio of one’s work. (2021-401, 2021-402, 2021-403) **Credit 3**

**2021-569 Art Gallery Management**  
The complex social and cultural role of a fine arts gallery will be explored through actual gallery operations: the installation of experimental and traditional exhibitions, promotion and marketing for art competitions, student initiatives, and special events tailored to RIT and community art audiences. (On-site presentations plus arranged hours in laboratory, gallery setting) **Credit 3**

**2021-572 Business Practices in Fine Arts**  
This class is devoted to business issues that artists face, including portfolio development, pricing and marketing strategies, public relations, and grants and other sources of financial support. Students research exhibition venues and career support services. The class also investigates communication skills necessary for professional accomplishment in the arts. **Credit 3**

**2021-578 New Forms Elective**  
This course provides the conceptual framework for new forms. Students will learn about some of the contemporary directions fine art has taken beyond the traditional disciplines of painting, printmaking, sculpture and drawing such as performance, installation and collaboration. Students will express their own ideas through these new forms. (Restricted to fourth-year CIAS status) **Credit 3**

## School of Design

### New Media Design and Imaging

**2009-201 New Media Perspectives**  
This course introduces students to the graphic and new media industries. Students study the history, culture, technology, markets and workers in these industries, establishing a basic understanding of the current technologies. Students will gain in comprehension of the businesses and roles that exist in the various industries and see an overview of industry structures and the effect of new media. **Credit 3**

**2009-206 Digital Video: Multimedia**  
Digital video technology brings creative moving image editing and manipulation to the new media student. The goal of this course is to teach the basic craft of filmmaking using the current digital software/hardware tools. Students will be expected to complete several shooting and editing exercises and two finished productions. **Credit 4**

**2009-212 3-D Form and Space**  
An introductory course in visualization that extends previous experience and skills to include the third dimension. The course will provide fundamentals for more advanced studies in three-dimensional animation, virtual spaces and multidimensional navigation spaces. Manual and digital tools will be used for problem solving. Students will be expected to show evidence of growth in three-dimensional understanding from simple objects to more complex environmental spaces. (New media majors or permission of instructor) **Credit 3**

**2009-213 Elements of Graphic Design for New Media**  
This course introduces the student to visual communication and the graphic design profession. Through formal studies and perceptual understanding, including aesthetics, graphic form, and structure; concept development, and visual organization methods, students will design solutions to communication problems. Assignments exploring aspects of graphic imagery, typography and production will be included. (New media majors or permission of instructor) **Credit 3**

**2009-311 Typography for New Media**  
A course to introduce students to the fundamentals of text document creation and to provide the terminology necessary to communicate with a client or originator and the manufacturer of the document. (2009-213 and new media majors or permission of instructor) **Credit 3**

**2009-312 Information Design for New Media**  
Information design for the Web and interactive multimedia integrate content with visual indicators. Legibility and clear communication of information and direction are important to the success of graphical user interface design. This course integrates imagery, type, icons, buttons, color, visual hierarchy and site architecture to design friendly and functional user interfaces. (New media core or permission of instructor) **Credit 3**

**2009-313 Introduction to Computer Imaging**  
An introduction to the computer as an illustrative tool. Emphasis will be on the application of visual organization methods in the context of electronic media. Exploration of raster and/or vector graphic software programs will serve as the basis for development of illustrative assignments. (New media core or permission of instructor) **Credit 3**

**2009-323** **Designing Graphical User Interface**  
An introduction to designing the interface, both visually and technically, for new media projects and applications. Good interface design allows the user to accomplish a variety of tasks. It should not force a user to look all over for information and buttons. It should allow the user to operate intuitively, with ease of navigation, and be entertained at the same time, regardless of the information being communicated. Team-taught lectures, presentations and demonstrations will investigate both the programming and visual communication aspects of developing good interface design. (New media core or permission of instructor) **Credit 3**

**2009-328** **Introduction to Digital Animation**  
An introduction to the techniques and practice of graphic and animated film production, this course provides training and practical experience in producing two-dimensional animated sequences using off-the-shelf multimedia software. Students produce a number of short exercises incorporating original computer-generated and non-digital artwork. Topics include key frame and 'tweening, cycling, acceleration, squash and stretch, backgrounds, inking, rotoscoping, sound, masking, multiplane effects, and space-to-time. Screenings of professionally made films will illustrate and provide historical perspective. Proficiency in drawing is not required but strongly recommended. (Required for new media design and imaging and second-year new media IT majors) **Credit 4**

**2009-401** **Advanced Design Networking**  
This course extends previous networking experience and skills to emphasize advanced visual Web design layout skill and the incorporation of time-based vector graphics. The emphasis of this course will be away from programming toward the application of software tools and design concepts related to more visual Web page development with interactive, dynamic interfaces. Typical software tools include, but are not limited to, Flash and Dreamweaver. (Completion of new media design sophomore core or permission of instructor) **Credit 3**

**2009-402** **Emerging Multimedia Design and Imaging Tool**  
Multimedia developers and designers are called upon to create a variety of interactive and animated pieces. One of the most powerful tools to create dynamic animation is Adobe After Effects. After Effects is used to create TV broadcast animations, instructional animations and high-impact logos and introductions. It gets its strength from being able to combine multiple still, motion and sound file formats into one cohesive piece. This course will explore and integrate a number of related software packages including, but not limited to, Peak, QuickTime and three-dimensional applications as well as conceptual development and production. (Completion of new media design sophomore core) **Credit 3**

**2009-403** **Dynamic Information Design**  
A study of the application of information design theory and practice to the developing area of new media. Cartography and iconography will be viewed in the context of Web and kiosk use. The delivery of consumer information, using interactive and dynamic media as the vehicle, will be investigated. (Completion of new media design sophomore core or permission of instructor) **Credit 3**

**2009-411** **Time-Based Imaging for New Media**  
New media students will develop short animated and interactive multimedia projects while learning the basics of the time-based authoring software Macromedia Director and Flash. The students will begin with short exercises, culminating in final larger electronic projects that develop their design and programming skills. Projects will include both passive and interactive components that will support the learning process. (New media freshman core or permission of instructor) **Credit 4**

**2009-412** **Dynamic Typography**  
This course will deal with design concepts related to moving type. The impact of type as it moves, rotates, explodes, scales and fades will be considered. Legibility of the message will be studied in relation to this movement. Students will learn how both two- and three dimensional type can be manipulated in a time-based manner. (Completion of new media design sophomore core or permission of instructor) **Credit 3**

**2009-413** **Advanced 3-D Techniques**  
This course extends previous three-dimensional experience and skills to include advanced three-dimensional effects such as particles, volumetric textures such as fog and the movement of three-dimensional objects using both fixed cameras and moving cameras. Gravity, wind and inverse kinematics will also be considered. (Completion of new media design and imaging sophomore core or permission of instructor) **Credit 3**

**2009-501** **Dynamic Persuasion Design**  
An incorporation of commercial practices such as advertising, editorial design and editorial illustration with dynamic media. Dynamic media refers to the inclusion of any audio, video and animation clips in a project. Dynamic media greatly add to the impact of the message being communicated. The point of message delivery will include the Web, CDs, kiosks, and video teasers and trailers. (Fourth-year new media design and imaging majors or permission of instructor) **Credit 3**

**2009-502** **Virtual Entertainment**  
A course dealing with design and gaming concepts, delivery systems and software for the entertainment industry. Working with two- and three-dimensional visual concepts, virtual reality, interactivity and sound, the student will develop media for the entertainment industry. Environments, characters, gaming strategies, role-playing concepts, navigation and feedback will be part of the information presented. (Fourth-year new media design and imaging majors or permission of instructor) **Credit 3**

**2009-511** **QTVR and Multimedia Design**  
This course extends previous multimedia and three-dimensional experience and skills to emphasize advanced multimedia applications using QTVR as a design tool to interactively explore and examine photo-realistic three-dimensional virtual worlds. Attention will be given not only to the mechanics of creating the movies but also to their design, relationship to the other visual elements, and visual communication effectiveness. (Fourth-year new media design and imaging major or permission of instructor) **Credit 3**

**2009-516** **Career Skills in New Media**  
This course is divided into two segments. The first centers on résumé development, cover letters, interviewing practices and portfolio options. The emphasis is on using the present level of experience to enter the job market. The second segment centers on the business and practice of design. This will encompass an overview of the designer/client relationship, design management, marketing, rights and ethics. (Completion of new media design and imaging junior core) **Credit 3**

**2009-522** **Experimental New Media**  
The course will provide for an experimental approach to integrating content with new media techniques and processes. Students will be encouraged to approach the computer as a medium of creativity to explore issues of narrative, identity, place, loss of the original and visual reality. Students will also develop planning and organizational skills for experimental interactivity and imaging projects. (Completion of new media design and imaging junior core) **Credit 3**

**2009-542** **New Media Team Project I**  
The first course in a two-quarter sequence designed to engage the new media major in a capstone production experience. The instructor will form student teams that will design and complete new media projects sponsored by clients outside the class. (2009-501 or 2083-541) **Credit 4**

**2009-543** **New Media Team Project II**  
The second course in a two-quarter sequence designed to engage the new media major in a capstone production experience. Students continue to work on their new media group production until completion. Each group is required to test its product with a focus group and provide written feedback and analysis. (2009-542) **Credit 4**

**2009-550, 551, 552, 553** **Special Topics**  
Topics of current or special interest designed to broaden and intensify students' ability to use art and design as a means of communication and expression. **Credit variable 1-9**

## Graphic Design

**2010-211** **Computer Skills: Raster Imaging**  
An introduction to basic computer software skills, terminology and technology as they relate to raster-based computer-imaging software such as Photoshop. This course provides the skills necessary to use drawing software relative to the design curriculum. The areas of file formats, software tools, image creation and file output are covered. **Credit 2**

**2010-216** **Computer Skills: Vector Imaging**  
An introduction to basic computer software skills, terminology and technology as they relate to vector-based computer drawing software such as Freehand and Illustrator. This course provides the skills necessary to use drawing software relative to the design curriculum. The areas of file formats, software tools, image creation and file output are covered. **Credit 2**

**Prerequisite for all 300-level graphic design:  
foundation program or equivalent**

**2010-301** **Elements of Graphic Design**  
Introduction to basic visual communication in the field of graphic design. Lectures will cover graphic design topics and information ranging from typographic terminology and design principles to methods of visual organization. Lectures will often be related to assignments that will be undertaken in the studio where hands-on introduction to graphic design studio skills and practices will occur. Through formal studies and perceptual understanding, including aesthetics, graphic form and structure, concept development and visual organization, students will design solutions to communication problems. Assignments will explore aspects of graphic imagery, typography and layout. Students will refine their computer skills through applications requiring a digital format. **Credit 3**

**2010-302** **Typography I**  
Introduction to typography in visual communication. Lectures will cover typographic topics and information ranging from communication principles to methods of visual organization. During studio time students will design solutions to assigned communication problems that will explore aspects of typography and layout as well as concept development and historical research. Students will refine their computer skills through applications requiring a digital format. **Credit 3**

**2010-313** **Introduction to Time-Based Design**  
This course introduces students to the fundamental principles of time-based graphic design, including forms of narrative, organizational methods, sequencing, composition, visual and motion variables, and the application of these principles to the solution of specific graphic design problems. Projects will include typography/imagery components, storyboard planning and computer-based applications as they apply to graphic design problem solving. (Completion of 2010-301, 2010-302, 2010-303) **Credit 3**

**2010-363** **Women Pioneers in Graphic Design**  
This course will center on the contributions made by key women designers to the history of graphic design. Emphasis will be on their design works, their design process and the nature of their largely unheralded pioneering efforts. Course will involve lectures, video interviews, assignments, projects and participatory classroom involvement. Students will utilize digital archival resources for research and study developed in conjunction with Wallace Library. **Credit 3**

**2010-372** **20th Century Editorial Design**  
This course will center on the development of editorial design in the 20th century with a focus on the time period from 1930 to 1950. Content will focus on the creators (artists, designers, photographers) and products (magazines, journals) in both a micro and macro view. The genre will include fashion, consumer, entertainment and business, and contemporary magazines. Course will involve lectures, video interviews, assignments, projects and participatory involvement. Students will utilize digital archival resources for research and study developed in conjunction with Wallace Library. **Credit 3**

**Prerequisite for all 400-level graphic design: sophomore graphic design courses or their equivalent, or permission of the instructor**

**2010-401** **Typography II**  
Students expand their understanding of basic typographic principles through advanced applied problems focused on typography as the visual representation of language, typographic hierarchy, formal values (syntax) of letterforms, and the typographic grid as a principle organizing system for providing meaningful structure. (2010-302, 2010-402) **Credit 3**

**2010-402** **Imagery in Design**  
Creative problem-solving experiences focus on the selection, generation and use of imagery in graphic design. Design process skills are enhanced as students learn how to explore the dynamics of image content and meaning, composition, color, scale, cropping, manipulation and the integration of imagery with typography. (Completion of foundations core) **Credit 3**

**2010-403** **Symbols and Icon Design**  
The focus of this course is on the principles, theory and terminology of symbols (primarily pictographic, nonverbal graphic communication), symbol systems, marks of identity and icon design for computer applications. Also emphasized are the inherent benefits and shortcomings of symbols, the application and use of symbols, and the evaluation or field testing of graphic symbols to substantiate effectiveness. (Completion of sophomore graphic design core or equivalent) **Credit 3**

**2010-404** **Design for Publication**  
Students explore the underlying principles of grid theory, text and display typography, sequence, page layout, and type and image integration as they relate to a range of publication design applications such as instructional materials, brochures, magazines, books, etc. (Completion of sophomore graphic design core or equivalent) **Credit 3**

**2010-405** **Information Design**  
Information design is an area of graphic design concerned with understanding reader and user responses to written and visually presented information. These are highly utilitarian problems in which the functional requirements of design are critical in making data and information understandable and accessible to the user. Principles of language, structure, emphasis, diagrammatic interpretation and the visual display of information are explored in the context of applied problems. (Completion of sophomore graphic design core or permission of instructor) **Credit 3**

**2010-406** **Environmental Design**  
Challenging, applied problems introduce students to the basic functions of environmental graphic design: to assist users in negotiating or "wayfinding" through a space or environment; to identify, direct, and inform; to visually enhance the environment; and to protect the safety of the public. (Completion of sophomore graphic design core or permission of instructor) **Credit 3**

**2010-463** **Packaging Design for Juniors**  
This course will focus on packaging design as an area of professional study within graphic design. Students will gain an understanding of meeting marketing objectives and creating promotional opportunities as well as educating consumers in the protection, presentation and inventory management of products. Through hands-on projects, students will engage in field research, the construction of models, graphic solutions and the execution of final prototypes. (Completion of sophomore graphic design core or equivalent) **Credit 3**

**2010-471** **History of Graphic Design**  
This course will be a thematic approach to graphic design history and provide a necessary historical basis for students in this major. The course will involve lectures on design history, pioneering designers, design from other cultures and countries, graphic design artifacts and the historical context for this design. In addition to lectures, the course will involve guest speakers, videos, participatory exercises, discussion and essay writing, which will build critical thinking skills. (Completion of sophomore graphic design major courses) **Credit 3**

**Prerequisite for all 500-level graphic design: junior graphic design courses or their equivalent, or permission of the instructor**

**2010-501** **Career Skills and Professional Practices**  
In this course students will prepare résumés, cover letters, and learn about interviewing techniques and strategies to focus on their areas of interest as they prepare to enter the job market. Emphasis will be on learning about the various types of positions available to designers, the designer/client relationship, and professional ethics and expectations. Information about cooperative experiences and internships will be provided. (Completion of sophomore graphic design core or permission of instructor) **Credit 2**

**2010-502** **Corporate Design**  
This course provides an overview of corporate design as an integrated study within the field of graphic design. Past and present corporate design models will give students historical background as well as provide current and future trends. Corporate design analysis, as well as development, application and implementation of identity-based projects will be explored. (Completion of junior graphic design core or permission of instructor) **Credit 3**

**2010-503** **Design History**  
To discover the fundamental ideas, forms and design principles governing style in design and art movements. Required is the design of a prototype guidebook on style in a design or art movement. Each student will select one movement from the list provided and develop a work plan for the guidebook, which will involve a proposal and outline. Information gathering and research will be followed by copy writing and collecting illustrations from the selected style. Copy and visuals will be integrated in a dummy sketch, which then will be developed and refined into a high quality comp for the book. The course will also include lectures, weekly presentations and critiques. **Credit 3**

**2010-504** **Design Systems**  
Advanced problems in corporation research and development of concepts that lead to applied projects as related to visual design systems. Packaging systems, advertising and promotional campaigns are some of the areas investigated. Human factors related to consumer preferences and audience response are also integrated. Teamwork on projects is expected. (Completion of junior graphic design core or permission of instructor) **Credit 3**

**2010-505** **Advertising Design**  
Advanced creative problem-solving experiences relating to advertising design and developing a selling tool. Course content and projects include advertising assignments, ethics, research methodology and production. Concept development and the use of imagery in advertising are stressed. (Completion of junior graphic design core or permission of instructor) **Credit 3**

**2010-506** **Concept and Symbolism**  
Advanced creative problem-solving experiences emphasize development of effective visual concepts and implementation. The focus is on innovation and application of creative concepts using visual symbolism for communicating specific messages to an audience/user. Areas such as promotion, advertising and marketing are integrated into the projects. (Completion of junior graphic design core or permission of instructor) **Credit 3**

**2010-507** **Design for Marketing**  
This course deals with the relationship between marketing and graphic design. It is not a marketing course to teach professional marketing skills and practices but is directed at teaching the graphic designer basic skills and terminology. The goal is to integrate marketing concepts with design practice, focusing on short- and long-term marketing and design projects. When possible, specific firms are contacted and engaged as clients/consultants. (Completion of junior graphic design core or permission of instructor) **Credit 3**

**2010-511** **Advanced Information Design**  
Advanced problems to further extend students' knowledge and experience with complex information design issues. Problems include legal documents, business forms, diagrams, transportation maps, statistical information, charts, graphs and tables, instructional materials, way finding systems and computerized information systems. (Completion of junior graphic design core or equivalent) **Credit 3**

**2010-512** **Introduction to Interactive Media Design**  
Students are introduced to the ideas, concepts, uses and general principles of interactive media on the computer. Several forms of logic and how they can be used in this design process are explored. Included are several projects to develop students' understanding of software, logic and aesthetic considerations in this field. Students are expected to complete assigned readings and projects. (Completion of sophomore graphic design core or permission of instructor) **Credit 3**

**2010-513** **Senior Projects**  
Advanced creative problem-solving experiences relating to visual communication imagery in the form of a self-designed project. This is based on a strong emphasis on formal design values and their use for the communication of ideas and information. The faculty mentor will review the project, and modifications may be made based on consultation with the student. The project may be thought of as a senior thesis project. (Completion of junior graphic design core) **Credit 3**

**2010-514** **Editorial Design**  
Explores the role of the graphic designer in developing an appropriate communicative editorial design. Students interpret and develop concepts for the author's text and point of view for each assigned editorial article. Content includes the relationship and use of typography, imagery and layout for editorial impact. Some sections of this course will work with the Editorial Photo class on assigned projects to experience the working relationship between the photographer and the designer, particularly in regard to editorial design. (Completion of junior graphic design core or permission of instructor) **Credit 3**

**2010-518** **Public and Social Service Design**  
Gives the graphic design senior professional experience developing and creating visual communications for nonprofit organizations. Through various community service agencies and in cooperation with the United Way Internship Program, students create design projects requiring skill and the ability to develop concepts through production, with emphasis on message content in relation to its audience. With guidance from the instructor, and by closely working with the organizations, students understand and experience client-designer relationships, budget limitations and time and project management. (Graphic design senior or permission of instructor) **Credit 3**

**2010-523** **Senior Internship**  
This course exposes students to the professional environment through outside job opportunities in graphic design studios, advertising agencies, corporate communications departments and other acceptable organizations. Students will be working under the guidance of art directors, creative directors, senior graphic designers or marketing communication managers and performing creative work that is educational and meaningful for their short-term academic goals as well as their long-range career preparation. (Completion of junior graphic design core) **Credit 3**

**2010-524** **Portfolio Development and Presentation**  
The objective of this course will be to assist the student in developing a professional portfolio and learning how to best present the work contained therein. Evaluation of current work and assessment of strengths and weaknesses will determine the specific actions, revisions, or generation of new work that will need to be undertaken as part of this course. High presentation standards will be expected as well as objective selection of work for meeting specific career expectations. (Completion of junior graphic design core) **Credit 3**

**2010-527** **Advanced Advertising Design**  
This course will explore the role of the graphic designer/art director in developing a comprehensive communication plan. All phases of marketing will be explored. Emphasis will be placed on effective communication of the client's message and concept development. Advertising will be addressed in a broad context, and the content of the course will include branding, positioning and the execution of concepts. The course will also address the relationship and use of typography, photographic imagery and layout for advertising impact. (Completion of junior graphic design major courses and 2010-505) **Credit 3**

**2010-561** **Introduction to Web Design**  
Students are introduced to the planning, design and production of interactive Web-based projects. Web design concepts and methods in site design, page design and graphic-user interface design will be explored. The course will include instruction in producing Web pages and creating interactivity with HTML and Web production software. (Completion of sophomore graphic design core and 2010-512) **Credit 3**

**2010-562** **Advanced Web Design**  
Students expand their understanding of Web design concepts and processes through advanced Web design projects and continue to develop planning, design and production skills for the Web. Advanced and dynamic methods in merging content and interactivity design are introduced. (Completion of junior graphic design core) **Credit 3**

**2010-567** **Advanced Interactive Media**  
Students expand their understanding of interactive media design concepts and processes through advanced projects. Projects will include advanced concepts and techniques in interactivity design and interface design; script-writing methods will be introduced. (Completion of junior graphic design core) **Credit 3**

## Computer Graphics Design

**2014-356** **3DDG Modeling**  
This course contrasts and compares various methods of creating geometry for use in three-dimensional environments including polygons, NURBS, patches and subdivision surfaces for various purposes. Skills learned can be applied to creating elements for computer and video games, creating virtual environments or in visualization. Students have the opportunity to work on group projects and real-world applications. Some models are designed and adapted for input into a game engine or VR software. (Sophomore standing and minimum 3.0 GPA) **Credit 4**

**2014-361** **3DDG Poly and Subdivision Modeling**  
This course provides extensive coverage of methods for modeling with polygons and subdivision surfaces. In addition students extend their knowledge of methods for laying out UVs for placing materials on polygonal shapes. With these techniques students create complex models of organic and inorganic forms using polygons and subdivision surfaces. (2014-356) **Credit 4**

**2014-362** **3DDG Shading**  
The course focuses on advanced techniques using shading networks to incorporate groups of two-dimensional and three-dimensional textures into realistic and non-photorealistic materials. Students learn to use texture maps instead of detail in models to increase interaction speeds. Textures are also used in order to incorporate simple models into complex scenes. Displacement textures are used to create detail in models. Use of elements in shading networks to control other attributes is covered as is the use of textures to simulate non-dynamic lights and shadows. Planning for the economical use of textures and for the replacement of models with texture maps in level of detail (LOD) situations will be addressed as well. (2014-356) **Credit 4**

**2014-366** **3DDG Character Design**  
This course covers first the design of characters and then the creation of them using three-dimensional software, inverse kinematics, parent and rigid binding, and bone deformers. Students create interpretant matrices, model sheets, sketches, and maquettes of characters followed by development of the character in software. Characters are designed to be incorporated into motion graphics, games or visualization. (2014-356) **Credit 4**

**2014-367** **3DDG Interactive Motion**  
This course covers the use of motion in interactive environments including motion graphics, games, visualization and virtual reality. Students create motion using key frames, paths, deformation, forward and inverse kinematics. Cyclical motion is created for integration into games and virtual environments. (2014-356) **Credit 4**

**2014-371** **3DDG Lighting**  
Students apply standard lighting methods to lighting three-dimensional models and spaces. The interaction of light and pigment and the use of light in painting, photography, film and computer graphics are used as examples. Students apply problem-solving techniques to arrive at a lighting solution for various problems. They also examine methods of integrating lighting into shaders for non-dynamic lighting. Methods of planning a lighting scheme for a larger project are addressed as well. (2014-356) **Credit 4**

**2014-388** **3DDG Rendering**  
This course contrasts and compares various methods and resolutions of rendering and outputting information from three-dimensional software for motion graphics, games and visualization. Primary emphasis is on the use of radiosity and advanced rendering options as well as planning for the impact of production choices on rendering times and interactivity. (2014-356 or 2014-362) **Credit 4**

**2014-463** **Introduction to Production Pipeline**  
The course focuses on implementing a three-dimensional digital graphics project in motion graphics, games or visualization from the planning stage through completion and presentation. (Junior standing and 2014-356) **Credit 4**

## Interior Design

**2015-215** **Interior Design Freshman Elective**  
Students will be given an overview of the field of interior design and an understanding of the educational requirements and expectations of the interior design major. The career options, required skills and the creative process as they apply to the field of interior design will be presented through lectures, class discussions, design projects and periodic interaction with professional designers. **Credit 2**

**2015-222** **Design Survey**  
Provides freshmen with increased exposure to the fields of graphic design, industrial design, interior design and new media. The class will provide students with an in-depth awareness of the role of design in society and a designer's ethical and social responsibilities. The course also describes how the design professions are related to one another yet presents their distinct and differentiated aspects. Objectives include exposing students to a common vocabulary, increasing their awareness of the individual disciplines and providing exposure to related contexts, philosophies and issues. **Credit 2**

**Prerequisites for 300-level interior design courses:  
foundation program or equivalent**

**2015-305** **Architectural Drawing**  
An introduction to interior design through architectural drafting. **Credit 3**

**2015-306** **Perspective Rendering**  
An introduction to residential interior design and perspective rendering. **Credit 3**

**2015-307** **Introduction to Interior Design**  
An introduction to interior design with emphasis on basic processes, spatial relationships and design conceptualization and development. **Credit 3**

**2015-308** **CADD Application**  
An introduction to the use of the computer as a tool in the interior design process. Use of the computer is required. **Credit 3**

**2015-311** **Model Building and Human Dimension**  
Introduction to design conceptualization through model building as well as exploration of the impact of human dimensions on interior space and the requirements of a diverse population of users. **Credit 3**

**Prerequisite for 400-level interior design courses: sophomore interior design core or their equivalent, or permission of the instructor**

**2015-404** **Hospitality Design**  
The applications of design methods and skills to the design of interior space for hospitality use. (Completion of sophomore interior design core) **Credit 3**

**2015-405** **Applications of Color and Light**  
Introduction to color and light for spatial development. (Completion of sophomore interior design core) **Credit 3**

**2015-406** **Retail Design**  
Introduction to designing interior space for retail use. (Completion of sophomore interior design core) **Credit 3**

**2015-407** **Building Construction Systems**  
Introduction of building construction systems for interior design. (Completion of sophomore interior design core) **Credit 3**

**2015-408** **Office Design and Planning**  
Introduction to interior design and planning for office use. (Completion of sophomore interior design core) **Credit 3**

**2015-409** **Interior Design Specifications**  
Introduction to specifications with emphasis on planning, construction documents, finishes, fire safety and flammability, testing standards and liability. In addition, the course introduces the use of sustainable materials and shows how materials affect the health and safety of building occupants. (Completion of sophomore interior design core) **Credit 3**

**2015-411, 412, 413** **Interior Design Elective**  
An elective offering basic instruction and involvement in design application projects. Each quarter concentrates on a specific topic of design study. **Credit 3**

**Prerequisite for 500-level interior design courses: junior interior design courses or their equivalent, or permission of instructor**

**2015-504** **Multi-story Multi-purpose Design**  
The application of design methods and skills to professional-level projects in interior design. (Completion of junior interior design core) **Credit 4**

**2015-505** **Building Codes and Regulations**  
Application projects concerned with building codes, regulations, fire safety, public safety and health, barrier-free design and the Americans with Disabilities Act. (Completion of junior interior design core) **Credit 2**

**2015-506** **Environmental Control Applications**  
Application projects involving plumbing, heating, ventilation, electrical, vertical transportation and acoustic concerns. (Completion of junior interior design core) **Credit 3**

**2015-507** **Health Care Design**  
An introduction to designing interior space for health care use. The application of design methods and skills to professional-level projects focusing on health-care facilities. (Completion of junior interior design core) **Credit 4**

**2015-508** **Interior Design Business Practice**  
An introduction to professional practices with emphasis on business formation: design marketing, legal and ethical responsibilities. (Completion of junior interior design core) **Credit 2**

**2015-509** **Career Planning**  
Development of a résumé and portfolio as well as job-search techniques with a focus on career planning. (Completion of junior interior design core) **Credit 2**

**2015-510** **Working Drawings**  
Professional interior design projects with an emphasis on the construction sequence and construction documentation. (Completion of junior interior design core) **Credit 4**

**2015-511** **Special Projects**  
Special projects in interior design emphasizing communication skills, theory and methods for the professional. (Completion of junior interior design core) **Credit 3**

## Industrial Design

**2035-215** **Industrial Design Freshman Elective**  
Students will be given an overview of the field of industrial design and an understanding of the educational requirements and expectations of the industrial design major. Career options, required skills and the creative process as they apply to the development of products, packaging and systems within the field of industrial design will be presented through lecture, class discussions, design projects and periodic interaction with professionals in the field. **Credit 2**

**Prerequisite for 300-level industrial design courses: foundation program or equivalent**

**2035-306** **Technical Drawing**  
An introduction to drafting in the field of industrial design. Emphasis is on the basic skills of orthographic drawing and dimensioning and their application to accurate communication of designs. **Credit 2**

**2035-307** **Graphic Visualization**  
Sketching and rendering techniques are developed through exercises that also promote abilities to visualize three-dimensional forms in two-dimensional representations. **Credit 3**

**2035-311** **Modelmaking**  
An introduction to modelmaking in the field of industrial design. Course work emphasizes skills necessary for accurate, detailed three-dimensional design and development. **Credit 2**

**2035-321** **Graphic Visualization I**  
First of three sequential classes that develop the student's ability to effectively generate, communicate and present ideas graphically. This is accomplished through concept sketching, detailed perspective, storyboarding, layouts and hybrid drawing using computer-generated enhancements. **Credit 2**

**2035-322** **Graphic Visualization II**  
The second of three sequential classes that develop the student's ability to effectively generate, communicate and present ideas graphically. This is accomplished through concept sketching, detailed perspective, storyboarding, layouts and hybrid drawing using computer-generated enhancements. (2035-321) **Credit 2**

**2035-323** **Graphic Visualization III**  
The third of three sequential classes that develop the student's ability to effectively generate, communicate and present ideas graphically. This is accomplished through concept sketching, detailed perspective, storyboarding, layouts and hybrid drawing using computer-generated enhancements. (2035-321, 2035-322) **Credit 2**

**2035-331** **Form I**  
The first of two classes that develop and utilize the student's ability to understand and organize design elements, form and space to meet specific human sensory responses through the creation and analysis of abstract relationships. **Credit 2**

**2035-332** **Form II**  
The second course of two that develop and utilize the student's ability to understand and organize design elements, form and space to meet specific human sensory responses through the creation and analysis of abstract relationships. (2035-331) **Credit 2**

**2035-348** **Sophomore Design Core**  
Introduction to design methodologies, processes and research techniques. **Credit 4**

**Prerequisite for 400-level industrial design courses: sophomore industrial design core its equivalent, or permission of the instructor**

**2035-405** **Materials and Processes Applications**  
The acquisition of a technical and theoretical base in industrial design through a formal introduction to materials and processes. **Credit 3**

**2035-406** **Consumer Product Design I**  
The acquisition of a technical and theoretical base in industrial design. Application of communication and problem-solving skills to comprehensive design projects involving form, processes and materials. Design development of small products through sketches, quick study mock-ups, and finished form studies. (Completion of industrial design sophomore core) **Credit 3**

**2035-407** **Human Factors Applications**  
The acquisition of a technical base in human factors for industrial design, emphasizing function and safety. (Completion of industrial design sophomore core) **Credit 3**

**2035-408** **Equipment Design**  
Application of communication and problem-solving skills to comprehensive design projects involving form, style, function, safety, processes and materials. Design development of tools and equipment through sketches, mock-ups and technical drawings to finished form studies. (Completion of industrial design sophomore core) **Credit 3**

**2035-409** **Product Style**  
The study of style, fashion and graphics as they apply to product form, storage and distribution. (Completion of industrial design sophomore core) **Credit 3**

**2035-410** **Consumer Product Design II**  
The application of communication and problem-solving skills to comprehensive design projects. Project emphasis on the consideration of style and fashion in determination of product form. (Completion of industrial design sophomore core) **Credit 3**

**2035-418** **CAD Applications II**  
Advanced computer modeling and rendering applications for the industrial designer. The emphasis in this course is on learning software tools competency through assigned exercises and creative projects. (2035-310 or permission of instructor) **Credit 3**

**2035-442** **History of Industrial Design**  
A study of the industrial design profession, designers and designs from 1920 to the present. Students will analyze designs in terms of style, materials, production, technology, ergonomics and context. (2039-225, -226, -227 or permission of instructor) **Credit 3**

**2035-463** **History of Modern Furniture Design**  
A study of modern furniture design and its most significant designers. Factors of style, materials, construction, and ergonomics are examined in the context of time, place and purpose. (2039-225, 226, 227 or permission of instructor) **Credit 3**

**2035-474** **Advanced Computer Modeling Elective**  
Advanced computer modeling and rendering applications for the designer. The emphasis in this course is learning higher software competency techniques for modeling complex and difficult shapes through assigned exercises and creative projects. The objective is an understanding of the most efficient use of professionally preferred tools for electronic surface modeling in degree 3 and higher B-spline curves and surfaces. (Alias Wavefront surface modeling at level or permission of instructor) **Credit 3**

**Prerequisite for 500-level industrial design courses: junior industrial design core or its equivalent, or permission of the instructor**

**2035-506** **Design Collaborative**  
Advanced product development in conjunction with a corporate design program providing technical information, marketing concerns and outside review of students' work. (Completion of junior industrial design core) **Credit 3**

**2035-508** **Furniture Design**  
Experience in the design of furniture for a defined market is acquired through a project exercise involving industry collaboration. (Completion of junior industrial design core) **Credit 3**

**2035-510** **Professional Practice**  
A review and study of design practices, including contracts, agreements, billings and business procedures. Résumé, portfolio development and employment possibilities also are explored. (Completion of junior industrial design core) **Credit 3**

**2035-511** **Product Development**  
A special student-interest project in industrial design, usually focused on the areas of sports/recreation products or toys. (Completion of junior industrial design core) **Credit 3**

**2035-512** **Advanced Product Design**  
The application of design methods and skills to professional-level projects in industrial design. Emphasis is on techniques and competencies common to or expected in the commercial world. (Completion of junior industrial design core) **Credit 3**

**2035-513** **Career Planning**  
Résumé and portfolio completion with informational interviewing and employment advising. (Completion of junior industrial design core) **Credit 3**

**2035-522** **Toy Design**  
Design of a toy or juvenile product in collaboration with industry representatives. Provides technical information, marketing opinions and professional review of work. (Completion of junior industrial design core) **Credit 3**

**2035-527** **Package Design**  
The design of packaging for the protection and marketing of goods. Aspects of visual, structural, ergonomic and environmental issues are considered in the design of rigid and flexible containers. (Completion of junior industrial design core) **Credit 3**

**2035-533** **Exhibit Design**  
Design of trade show and similar exhibits involving structure, graphics, lighting and layout of space. Students will develop concepts into a scale model for presentation. (Completion of junior industrial design core) **Credit 3**

## School for American Crafts

### Ceramics

**2040-215** **Freshmen: Introduction to Ceramics**  
An introduction course with an overview of historical perspective, hands-on projects and demonstrations, slide talks, introduction to vocabulary and terminology, and discussion of career opportunities. **Credit 2**

**2040-251, 252, 253, 254** **Ceramics Elective**  
An elementary course in design and techniques in ceramics. Each quarter different techniques are taught, including wheel, handbuilding, glaze, and decorating. Materials fee required. **Credit 3**

**Prerequisite for all 300-level courses: successful completion of foundation program or equivalent or permission of the instructor**

**2040-301** **Materials and Process of Ceramics: Sophomore**  
A course with concentration on the fundamentals of pottery making. The student will design and make utilitarian pottery, with emphasis on form, function and surface decoration. The student will primarily focus on high firing techniques but will also study clay materials and chemistry. **Credit 6**

**2040-302** **Materials and Process of Ceramics: Sophomore**  
This course continues to focus on the fundamentals of working with ceramics. The emphasis is on the vessel format. Primarily students will be working with handbuilding techniques and with a mid-range firing temperature. They will also learn glaze calculation. (2040-301) **Credit 6**

**2040-303** **Materials and Process of Ceramics: Sophomore**  
This course investigates the issues involved in ceramic sculpture. Students will primarily investigate issues of form and scale. The primary focus of firings will be low fire and raku techniques. In this course the student will also learn the fundamentals of kiln building and firing techniques. (2040-302) **Credit 6**

**Prerequisite for all 400-level courses: successful completion of all sophomore level courses in ceramics**

**2040-401** **Materials and Process of Ceramics: Junior**  
A course with concentration on utilitarian ceramics, the fundamentals of pottery making. There will be a focus on students developing their own aesthetic ideas and independent firing methodology. A continuation of technique development in ceramic making and firing. The students will also work on the connections of their work and ceramics art history. (2040-303) **Credit 6**

**2040-402** **Materials and Process of Ceramics: Junior**  
A course with continuing concentration on the vessel. Students will investigate their own methodologies of making and developing their ideas through the vessel. There will be an emphasis on historical context and personal expression. (2040-401) **Credit 6**

**2040-403** **Materials and Process of Ceramics: Junior**  
A course with continuing concentration on developing ceramic sculpture. Working on both large and small scale and addressing the concepts of presentation, there will be a strong emphasis on developing the student's own aesthetics, personal voice and idea. (2040-402) **Credit 6**

**2040-501** **Materials and Process of Ceramics: Senior**  
A course to begin to develop a senior thesis. This is a cohesive body of work centering on a singular theme agreed to by the student and his or her adviser. Students are required to develop their own clays, glazes and firing methodology and will begin to research information for their written thesis. (2040-403) **Credit 6**

**2040-502** **Materials and Process of Ceramics: Senior**  
Students will continue to develop their senior thesis studio work. There will be an emphasis on contemporary and historical context for this work as well as personal glaze and firing development. Students will begin to address the written element of their thesis and develop a body of work for their senior thesis exhibition. (2040-501) **Credit 6**

**2040-503** **Materials and Processes of Ceramics: Senior**  
Seniors' final written thesis exhibition is the culmination of their year's work. (2040-502) **Credit 6**

### Glass

**2041-215** **Freshmen: Introduction to Glass and Glass Sculpture**  
This is a survey course for students interested in glass as a medium for artistic expression and design applications. Topics regarding history, contemporary issues, science and technology of glass are discussed. Students will conceive, design and execute glasswork with engraving, glass blowing and casting. Emphasis will be on introductory learning and career opportunities that are available with the material. The course includes a visit to the Corning Museum of Glass. **Credit 2**

**2041-251, 252, 253, 254** **Glass Elective**  
A survey course emphasizing cold, warm and hot glass working processes as a means of personal expression and appreciation. A portion of the course is a basic investigation of the history, chemistry, techniques and technical aspects of glass. Materials fee required. **Credit 3**

**Prerequisite for all 300-level courses: successful completion of foundation program or equivalent or permission of instructor**

**2041-301** **Materials and Processes of Glass: Sophomore**  
This class will introduce the student to grinding, polishing, lamination and adhesives. Basic solid and blown hot forming will be covered. The student will acquire practical experience with the operation and maintenance of all cold and hot working equipment in the shops. Materials fee required. **Credit 6**

**2041-302** **Materials and Processes of Glass: Sophomore**  
This class will continue exploring hot and cold glass techniques. Basic color and bit application in molten glass working will be covered. Sand carving and step blasting will be part of this class as students create works for the final presentation. Materials fee required. (2041-301) **Credit 6**

**2041-303** **Materials and Process of Glass: Sophomore**  
The class will introduce the student to techniques of painting and reverse painting on solid, blown and plate glass. Paradise paints, enamels and polymers will be used as painting mediums for artistic exploration and decorative purposes. Construction and use of plaster molds for blown glass will be introduced as a way to create sculptural elements for a final project. Materials fee required. (2041-302) **Credit 6**

**2041-321** **Flameworking and Stained Glass**  
A survey course emphasizing glass flameworking and stained glass fabrication as means of personal expression and utilitarian design. Basic investigation of the history, chemistry and technical aspects of glass will be covered. Material fee required. **Credit 2**



**Prerequisite for all 400-level courses: successful completion of all sophomore level courses in glass**

**2041-401** **Materials and Process of Glass: Junior I**  
The class will introduce the student to sand casting, pate de verre, lost wax casting, billet casting, and gravity casting. Alternative forms of model building, mold making with clay, and wax for casting glass are part of this course. Annealing cycles and the use of the oven controls will be utilized as the student develops solutions to casting problems. Students will explore the history of glass. In glassblowing, Graal pick-up and other techniques involving pre-formed blanks or elements will be taught. There will be an emphasis on teamwork and experimentation with new techniques. Options for problem solving include mixed media sculpture and the vessel. Materials fee required. (2041-303) **Credit 6**

**2041-402** **Materials and Process of Glass: Junior I**  
Utilizing the Corning Museum of Glass study collection and the museum's Rakow Research Library; students will develop a body of work that reflects their specific interests with glass. Students may select a concept from the following or develop an alternative topic: glass equipment construction, building a studio, public commissions, developing a production series, industrial design for glass, colored glass chemistry, creative resources for a sculpture, art education, and the gallery. The student will make a formal presentation related to the selected research topic. Materials fee required. (2041-401) **Credit 6**

**2041-403** **Materials and Process of Glass: Junior I**  
Utilizing the Corning Museum of Glass study collection and the museum's Rakow Research Library; students will develop a body of work that reflects their specific interests with glass. Students may select a concept from the following or develop an alternative topic: glass equipment construction, building a studio, public commissions, developing a production series, industrial design for glass, creative resources for a sculpture, art education, and the gallery. The student will make a formal presentation related to the selected research topic. Materials fee required (2041-402) **Credit 6**

**Prerequisite for all 500-level courses: successful completion of all sophomore level courses in glass**

**2041-501** **Materials and Process of Glass: Senior I**  
Independent work produced during this quarter will be of an exploratory nature. Working with the instructor, students will identify concepts for senior-level research based on individual interests and visual exploration. Preparation for graduation, including a written thesis, portfolio presentation, artist's statement and senior exhibition will be a part of this course. Materials fee required. (2041-403) **Credit 6**

**2041-502** **Materials and Process of Glass: Senior I**  
Information developed during the previous course will serve as a foundation for in-depth research to be developed during this quarter. A statement describing the nature and intent of the thesis is required before week two of this term. Students will refine and develop a body of work for the senior exhibition and will submit an initial draft of the thesis at the end of this quarter. Materials fee required. (2041-501) **Credit 6**

**2041-503** **Materials and Process of Glass: Senior I**  
Students will conclude their senior year with a solo exhibition of their creative work. The specifics of the exhibition, including location, installation, opening, invitation announcement and mailing list will be developed by the senior student. The written thesis, 20-slide portfolio, artist's statement and résumé will be presented to the department head before graduation. Alternative or additional prerequisites may be required depending on the individual's thesis. Materials fee required. (2041-502) **Credit 6**

## **Metals**

**2042-215** **Freshmen: Introduction to Metals/Jewelry**  
This introductory course exposes the beginning student to the basics and fundamentals of the metals/jewelry field as a career path in the field of contemporary crafts. Slide lectures, technical demonstrations, field trips, hands-on experience and critiques will be used. **Credit 2**

**2042-251, 252, 253, 254** **Metals Elective**  
An elective course providing an opportunity for introductory study in metals in the area of either holloware or jewelry. Materials fee required. **Credit 3**

**Prerequisite for all 300-level courses: successful completion of foundation program or equivalent or permission of instructor**

**2042-301** **Materials and Processes of Metals: Sophomore**  
This class will introduce the student to basic jewelry hand tools. Ferrous and non-ferrous metals, their composition and working priorities will serve as the primary topics covered. Materials fee required. **Credit 6**

**2042-302** **Materials and Processes of Metals: Sophomore**  
This class will introduce the student to basic machine skills, silver soldering and gem setting. Materials fee required. (2042-301) **Credit 6**

**2042-303** **Materials and Process of Metals: Sophomore**  
This class will introduce the student to basic forming skills for holloware, flatware, and jewelry. Materials fee required. (2042-302) **Credit 6**

**Prerequisite for all 400-level courses: successful completion of foundation program or equivalent or permission of instructor**

**2042-401** **Materials and Processes of Metals: Junior**  
This class will introduce the student to advanced properties of gold as a material as well as advanced casting and mold-making techniques. Materials fee required. (2042-303) **Credit 6**

**2042-402** **Materials and Processes of Metals: Junior**  
This course introduces jewelry and holloware rendering, chasing and repousse, and tool making. Materials fee required. (2042-401) **Credit 6**

**2042-403** **Materials and Processes of Metals: Junior**  
This course introduces jewelry and holloware design and production through the use of kumboo overlay technique and acid etching. Materials fee required. (2042-402) **Credit 6**

**2042-501** **Materials and Processes of Metals: Senior**  
This course concentrates on holloware design and production through the introduction of spinning, advanced holloware techniques and rendering. The design and compiling of a professional résumé is also a requirement. Materials fee required. (2042-403) **Credit 6**

**Prerequisite for all 500-level courses: successful completion of all sophomore level courses in metals**

**2042-502** **Materials and Processes of Metals: Senior**  
This course introduces advanced gem setting and identification, gemstone anatomy and jewelry mechanisms. Students also begin to pursue the issue of career opportunities by involving themselves in contacting potential employers in a "job search" seminar. Materials fee required. (2042-501) **Credit 6**

**2042-503** **Materials and Processes of Metals: Senior**  
This course provides the student with individual research in technique and design. The third-quarter senior level students are encouraged to assemble a group show of their four years' work and complete a job search and professional portfolio, including résumé, photography and renderings. Materials fee required. (2042-502) **Credit 6**

## **Textiles**

**2043-251, 252, 253, 254** **Textile Elective**  
A basic course in design and techniques in textiles. Each quarter a different area of study is undertaken in quilt making, natural basketry, crochet, soft sculpture or other non-loom textile processes. Materials fee required. **Credit 3**

## **Wood**

**2044-215** **Freshmen: Introduction to Woodworking and Furniture**  
This course is designed to introduce the beginning student to the field of woodworking and furniture design. There will be hands-on involvement with the material as well as a look at career opportunities for a contemporary woods craftsman. Slide talks, technical demonstrations, field trips, design and design review will be some of the ways we experience this area firsthand. **Credit 2**

**2044-251, 252, 253, 254** **Wood Elective**  
A nonsequential, elementary course in designing and building wooden projects such as a tray, small box, or small table. More choice of project is afforded students who take the course for a second or third quarter. Materials fee required. **Credit 3**

**Prerequisite for all 300-level courses: successful completion of foundation program or equivalent or permission of instructor**

**2044-301** **Materials and Processes of Wood: Sophomore**  
This is the first of a three-quarter sequential class covering the fundamental techniques and aesthetics of woodworking. Topics covered include the care and use of hand tools, wood as a material, its basic properties, basic joinery, fundamental techniques of wood fabrication and finishing. The course includes a machine maintenance program. Materials fee required. **Credit 6**

**2044-302** **Materials and Processes of Wood: Sophomore**  
This is the second of a three-quarter sequential class covering the fundamental techniques and aesthetics of woodworking. Topics covered include the continued care and use of hand tools and the introduction of power equipment. Basic joinery and fundamental techniques of wood fabrication are continued using both hand and power equipment, and additional finishing techniques are studied. The course includes a machine maintenance program. Materials fee required. (2044-301) **Credit 6**

**2044-303** **Materials and Processes of Wood: Sophomore**  
This is the third of a three-quarter sequential class covering the fundamental techniques and aesthetics of woodworking. Topics covered include the continued care and use of hand tools and the further introduction of power equipment. Basic joinery and fundamental techniques of wood fabrication are continued using both hand and power equipment, and additional finishing techniques are studied. The course includes a machine maintenance program. Materials fee required. (2044-302) **Credit 6**

**Prerequisite for all 400-level courses: successful completion of all sophomore level courses in wood**

**2044-401** **Materials and Processes of Wood: Junior**  
This is the first of a three-quarter sequential class covering the intermediate techniques and aesthetics of woodworking. This course addresses issues surrounding the design and construction of a chair with regards to aesthetics, ergonomics, structure (geometry, triangulation), materials, etc. The course includes a machine maintenance program. Materials fee required. (2044-303) **Credit 6**

**2044-402** **Materials and Processes of Wood: Junior**  
This is the second of a three-quarter sequential class covering the intermediate techniques and aesthetics of woodworking. This course addresses the issues of source material used for inspiration in the design process. It requires the investigation and selection of specific source material to be used to design a specific piece of furniture. Additional techniques are also included. The course includes a machine maintenance program. Materials fee required. (2044-401) **Credit 6**

**2044-403** **Materials and Processes of Wood: Junior**  
This is the third of a three-quarter sequential class covering the intermediate techniques and aesthetics of woodworking. This course addresses the issues of large, solid, wood carcass construction, as well as multiple drawer construction, through the design and construction of a chest of drawers. Additional techniques are also included. The course includes a machine maintenance program. Materials fee required. (2044-402) **Credit 6**

**Prerequisite for all 500-level courses: successful completion of all sophomore level courses in wood**

**2044-501** **Materials and Processes of Wood: Senior**  
This is the first of a three-quarter sequential class covering the advanced techniques and aesthetics of woodworking. This course addresses aspects of woodworking students may wish to pursue after graduation. Students select from a menu of topics: jigs and fixtures (shaper, router, etc.), industry-related series production, outdoor, site specific, multiple seating, multimedia, and sculpture. They then develop a proposal for a body of work that may span more than one quarter. Students may select more than one topic. The course includes a machine maintenance program. Materials fee required. (2044-403) **Credit 6**

**2044-502** **Materials and Processes of Wood: Senior**  
This is the second of a three-quarter sequential class covering the advanced techniques and aesthetics of woodworking. This course addresses aspects of woodworking students may wish to pursue after graduation. Students select from a menu of topics: jigs and fixtures (shaper, router, etc.), industry-related series production, outdoor, site specific, multiple seating, multimedia and sculpture. They then develop a proposal for a body of work that may span more than one quarter. Students may select more than one topic. The course includes a machine maintenance program. Materials fee required. (2044-501) **Credit 6**

**2044-503** **Materials and Processes of Wood: Senior**  
This is the last of a three-quarter sequential class covering advanced techniques and aesthetics of woodworking. This course addresses aspects of woodworking students may wish to pursue after graduation. Students select from a menu of topics: jigs and fixtures (shaper, router, etc.), industry-related series production, outdoor, site specific, multiple seating, multimedia, and sculpture. This represents a continuation of the body of work begun in a previous quarter. Students may select more than one topic. The course includes a machine maintenance program. Materials fee required. (2044-502) **Credit 6**

## General Crafts Studies

**2045-311** **Concept Drawing**  
Freehand concept sketching technique for the crafts major. **Credit 3**

**2045-312** **Crafts Technical Drawing**  
Course covers basic drafting technique as it is used for both design and presentation. Topics covered include use of instruments, lettering, standard conventions, dimensioning, basic layout techniques and formats, orthographic projection, sectioning, auxiliary views, axonometric drawings, measured perspective, comprehensive working drawings, and presentation techniques. **Credit 3**

**2045-313** **Crafts Drawing-CADD**  
Course covering introduction to basic computer-assisted drawing and design (CADD) technique as it is used for both design and presentation. Topics covered include introduction to the computer, basic CADD issues, two-dimensional drafting, the three-dimensional environment, associative views, generating working drawings, printing and plotting. **Credit 3**

**2045-511** **Planning a Career in the Crafts**  
One of three courses covering topics commonly associated with the operation of a small business in fields related to the fine and applied arts. This course covers career assessment, qualitative and quantitative evaluation and assessment of potential career paths through the development of a comprehensive business plan, and employment options. The course includes lectures, group discussions, independent study, studio and business visits, homework, papers and reports, and oral presentations. **Credit 3**

**2045-512** **Crafts Promotional Package**  
One of three courses covering topics commonly associated with the operation of a small business in fields related to the fine and applied arts. This course addresses promotional issues including portfolio, photography, résumé writing, business cards and stationery, marketing, and client relations, etc. Students will create their own comprehensive promotional package. The course includes lectures, group discussions, independent study, studio and business visits, homework, papers and reports, and oral presentations. **Credit 3**

**2045-513** **Operating a Business in the Crafts**  
One of three courses covering topics commonly associated with the operation of a small business in fields related to the fine and applied arts. This course addresses day-to-day business operations, including marketing, contracts and other legal issues, record keeping, banking, insurance, taxes, employees, and location and layout of a business. The course includes lectures, group discussions, independent study, studio and business visits, homework, papers and reports, and an oral presentation. This course is required for all School of American Crafts BFA seniors. **Credit 3**

## Crafts Extended Studies

**2046-201** **Ceramics**  
This introductory ceramics course combines wheelthrowing and handbuilding techniques with clay. Through a variety of forming methods, students will learn about making all kinds of ceramic objects. Slide lectures will support and introduce projects. Materials fee required. May be taken more than once for credit. **Credit 2 per quarter**

**2046-206** **Metalcrafts/Jewelry**  
Emphasis on basic jewelry-making techniques involving sawing, filing, soldering, hand and machine finishing, simple stone setting, and more. Design is stressed throughout the course. Materials fee required. May be elected more than once for credit. **Credit 2 per quarter**

**2046-211** **Woodworking**  
Explorations in joinery, finishing, use and care of hand tools, and basic procedures in machine woodworking. In this course, the development of design skills and technical ability is emphasized. Materials fee required. May be taken more than once for credit. **Credit 2 per quarter**

# School of Film and Animation

**2065-201** **Production I**  
This course combines technical information in motion picture exposure and editing with a theoretical and practical approach to motion picture continuity. Production will be in 16mm (nonsync) format. Students furnish film, processing and editing supplies. Equipment is furnished. **Credit 4**

**2065-202** **Production II**  
A foundation course in editing theory and practice for motion pictures. Emphasis is on identification of concerns regarding a variety of approaches to the edited image. The student edits digital video format taped projects designed to address specific editorial concerns. Students provide videotape; equipment is furnished by the department. (2065-201) **Credit 4**

**2065-203** **Production III**  
This is the third sequential course for freshman film/video/animation majors. This course introduces the nature and importance of the sound component in creating cinematic works. Students will be exposed to a variety of possible treatments of sound using historical and contemporary examples in cinema. They learn the processes, equipment and techniques, as well as creative and efficient strategies, for multitrack soundtrack creation. (2065-201 and 2065-202) **Credit 4**

**2065-206** **Story and Structure**  
A discipline-specific introductory course designed to introduce first-year students to the meaning of "story," the components of a story, approaches to film structure, and the variety of expressions that a film can take. **Credit 2**

**2065-216** **Fundamentals of Computer and Imaging**  
This course will give students basic knowledge in the theory and practice of computer hardware and software. Operating systems including Mac, Windows and Unix will be described. Networking for e-mail, file transfer and Web will be studied. Basic theory of imaging and compression technology for pictures, movies and sound will be covered. File formats and disk formats for internal and removable media will be examined. **Credit 3**

**2065-217** **Digital Video for Multimedia**  
Digital video technology democratizes creative moving image editing and manipulation. Broadly, the goal of this course is to teach the basic craft of filmmaking using the most current available digital software/hardware tools. Students will be expected to complete several shooting and editing exercises as well as produce two finished productions. **Credit 4**

**2065-221** **Materials and Processes of the Moving Image**  
Familiarizes students with the basic technical concepts of film and video making. Students gain an understanding of the technical theory required to work in these media. **Credit 2**

**2065-222** **Film Language**  
A screenings, readings and writing course designed to give students the opportunity to trace the development of the techniques and forms of communication in what now constitutes the classic cinema. **Credit 4**

**2065-231** **Film and Video Materials and Technology**  
This course provides a fundamental treatment of photographic processes beginning with the nature of light and light-sensitive materials (silver halide film, CCD/CMOS) that are used in motion imaging. Chemical concepts of equilibrium, reactivity and kinetics within photographic systems will be examined. Exposure and color balance control will be explored. Fundamental technological principles in camera and projection systems will be discussed. Light-sensitive emulsion chemistry and formulation, latent image theory and the associated dynamic processes as well as development to form color images will be treated. Fundamentals of solid state and digital imaging processes such as telecine and digital projection systems will be explored. A laboratory section will emphasize application of concepts covered in lectures. **Credit 4**

**2065-243** **Introduction to Portable Video I**  
A basic course for non-majors. Emphasis is on videotape and its use as an interpretive and expressive medium. A combined theoretical/ practical approach to the dynamics of the medium. Two short video projects are required. VHS production and editing facilities are provided by RIT. Students must purchase a minimum of two 60-minute, 1/2" videocassettes. This course does not count as elective credit for film/video or animation majors. **Credit 4**

**2065-263** **Single-Frame Motion**  
This class is intended to give students a thorough, intuitive understanding of animation motion. Emphasis will move towards hands-on exercises without the demands of finished production. Image capture and playback technologies will be immediate so students will see the results of their efforts quickly. The assignments will direct students to shoot pixelation, animation of real objects, cutouts, and pre-made puppets. **Credit 2**

**2065-316** **Production Processes**  
An introduction to all aspects of professional film/video narrative production. Students produce short projects while learning basic shooting and crewing procedures, equipment handling, and maintenance. (2065-203) **Credit 5**

**2065-317** **Advanced Animation Workshop: Documentary**  
Students produce short documentary projects in either film or video, depending on their prerequisites, or, with consent of the instructor, they may work in any medium appropriate to their experience and resources, such as still photo, painting, animation, comic strip, performance, radio or multimedia. Students are encouraged to experiment with individual style and, while producing their own work, also serve as part of a production planning team and production crew for all other projects. Students complete projects for presentation at public departmental screenings. (2065-311 or 2065-431) **Credit 4**

**2065-319** **Production Workshop: Documentary**  
Students produce short documentary projects in either 16mm film or video, depending on their prerequisites or with consent of instructor. Students may work in any medium appropriate to their experience and resources, such as still photo, painting, animation, comic strip, performance, radio or multimedia. Students are encouraged to experiment with individual style and, while producing their own work, also serve as part of a production planning team and production crew for all other projects. Students complete projects for presentation at public departmental screenings. (2065-311 or 2065-431) **Credit 4**

**2065-322** **Lighting for Movement**  
This workshop is designed to explore creative and technical ways to use lighting to bring a scene to life in the two-dimensional medium of film or video. Proper utilization of a set requires the actors to move within that space, yet the placement of the lighting instruments along with the quality of light is a very complex task. This course will introduce and enhance these skills. (2065-431 or 2065-311) **Credit 4**

**2065-324** **Live-Action Pre-Production**  
Students will learn the basic pre-production techniques for narrative fiction, experimental and documentary filmmaking. Students will also prepare a pre-production binder in a genre of their choice to be used in an actual production. Course requires a prepared script or proposal. (2065-203) **Credit 3**

**2065-327** **Advanced Production Workshop: Experiment I**  
Students produce short projects as experiments in concept, style or technology and are encouraged to take risks, break "rules" and explore their own unique creative potential without fear of grade punishment for being different. Students may work in either film or video, depending on their prerequisites, or, with consent of the instructor, students may work in any medium appropriate to their experience and resources, such as still photo, painting, animation, comic strip, performance, radio or multimedia. While producing their own work, students also serve as part of a production planning team and production crew for all other projects. Students complete projects for presentation at public departmental screenings. (2065-431 or 2065-311 or permission of instructor) **Credit 4**

**2065-328** **Advanced Production Workshop: Experiment II**  
Students produce short projects as experiments in concept, style or technology and are encouraged to take risks, break "rules" and explore their own unique creative potential without fear of grade punishment for being different. Students may work in either film or video, depending on their prerequisites, or, with consent of the instructor, they may work in any medium appropriate to their experience and resources, such as still photo, painting, animation, comic strip, performance, radio or multimedia. While producing their own work, students also serve as part of a production planning team and production crew for all other projects. Students complete projects for presentation at public departmental screenings. (2065-327) **Credit 4**

- 2065-329** **Production Workshop: Experimental**  
Students produce short projects as experiments in concept, style or technology and are encouraged to take risks, break “rules” and explore their own unique creative potential without fear of grade punishment for being different. Students may work in either 16mm film or video, depending on their pre-requisites, or with consent of instructor. Students may work in any medium appropriate to their experience and resources, such as still photo, painting, animation, comic strip, performance, radio or multimedia. While producing their own work, students serve as production planning team and production crew for all other projects. Students complete projects for presentation at public departmental screenings. (2065-431 or 2065-311 or permission of instructor) **Credit 4**
- 2065-331** **Introduction to Animation I**  
This class is a survey of basic techniques and aesthetics of animation and provides training and practical experience in a wide variety of approaches to single-frame motion picture production. Students produce a number of short film exercises utilizing cutout, paint and draw animation as well as kinestasis. Extensive film screenings illustrate each technique and related aesthetics. (2065-263; JPHQ or JPHF major or consent of instructor) **Credit 4**
- 2065-332** **Advanced Animation Tools**  
This course in animation techniques and tools provides the student with the training and practical experience necessary for independent operation of animation equipment and the independent production of animated film. A variety of traditional and experimental techniques are explored in depth. These techniques include animation stand as well as three-dimensional animation execution. Students work independently and in group situations and participate in all phases of animated film production. Students have the opportunity to explore mixed technique approaches and to utilize their experiences in photography, graphic arts, painting, sculpture, and other backgrounds and skills. Film screenings illustrate a variety of different techniques, styles, and production concerns and practices. Proficiency in drawing is not required. Course not offered every year. (2065-331) **Credit 4**
- 2065-333** **Animation Production**  
Provides practice in all phases of single-frame film production. Students produce a short film with sound of their own design. Weekly meetings will discuss and critique the progress and merits of the film. Students will rely only on techniques learned in previous classes. Final film must be screened for the school community. Course not offered every year. (2065-332) **Credit 4**
- 2065-339** **Production Workshop: Fiction**  
In this course students will produce short fiction projects in either 16mm film or video, depending on their pre-requisites or with consent of instructor. Students may work in any medium appropriate to their experience and resources such as still photo, painting, animation, comic strips, performance, radio or multimedia. Students are encouraged to experiment with individual style and, while producing their own work, also serve as part of a production planning team and production crew for all other projects. Students complete projects for presentation at public departmental screenings. (2065-311 or 2065-431) **Credit 4**
- 2065-342** **Scriptwriting I**  
This course is the first in a series of courses on the writing of scripts for theatrical and nontheatrical films and television. This course introduces students to the forms and techniques of writing for dramatic media, including a brief introduction to writing for experimental and documentary films. Throughout the course, students keep a creative journal of ideas and characters to be used in story development. Students are responsible for writing a short film or television script of their own choosing and for completing several brief written exercises in areas such as personal storytelling, character development, dialogue and plot. (2065-206) **Credit 3**
- 2065-343** **Scriptwriting II**  
This course is the second in a series on the writing of scripts for theatrical and nontheatrical films and television. The class focuses on the scene as the basis of dramatic structure and offers students the opportunity to hone the skills developed in the previous class. Students are responsible for writing a film or television script on a subject of their own choosing and for completing several brief written exercises in areas such as character, dialogue, suspense, subtext and plot. Class discussion is based on assigned readings, in-class exercises, and in-class reading of student work. (2065-342) **Credit 3**
- 2065-344** **Post Production Processes**  
This course is designed to teach students the professional workflow of handling digital film and video files through the complex post-production process. Areas of study include learning a cinema file database, media management, color correction, HD compositing, visual and time base effects, sound processing and tracking building, and titling and graphics. (2065-316) **Credit 4**
- 2065-345** **Acting for Film and Video**  
A course in basic acting technique with emphasis on the special problems peculiar to film and video production. The class is taught in conjunction with 2065-347 (Directing the Actor). Class meetings are organized around the presentation of scenes prepared by student actors and directors. **Credit 3**
- 2065-347** **Directing the Actor**  
A course in basic directorial techniques with emphasis on the special problems peculiar to film and video production. Class meetings are organized around the presentation of scenes prepared by student directors. **Credit 3**
- 2065-350** **Figure Drawing: Animation**  
A studio figure drawing class suited specifically to the needs of drawn character animators. Live models will provide frequent short poses, revealing stages of movement, center of gravity, dramatic gesture and specific movement in dance and sports. Students will draw rapidly and will be asked to conjecture form from unseen shapes and flowing motion. Frame-per-frame video will be examined of live model’s movement and compared to students’ drawings. (At least one figure drawing class or permission of instructor) **Credit 3**
- 2065-352** **Animation Preproduction**  
Students collect and produce short film ideas and learn to express them in a variety of methods. Short film scripts will be written in a workshop setting and shared with class in critiques. Students will learn how to create digital soundtracks and read digital sound. Students will make animation bar sheets for sound/image relationships and timings and exposure sheet design. Students will also work with storyboards scanned into the computer and manipulated in time with sound as animatics as another tool for initializing animation production. (2065-331) **Credit 4**
- 2065-353** **Camera Choreography**  
This workshop is designed to explore creative ways to bring a scene to life in the two-dimensional film medium. Composition, perspective, camera operation and movement will be studied. These skills will be appropriate for all students studying directing, cinematography, editing and animation. (2065-431 or 2065-311) **Credit 4**
- 2065-354** **Business of Film and Video**  
Examines the business aspects of designing, developing and producing film/video projects. Emphasis is on development of production projects with interactive problem-solving experiences in which the instructor and students work as a production team. Special attention is given to script development techniques, estimation and management of production costs, location productions, live broadcasts and the cost/quality considerations of film/video production. Specific issues and situations are used as exercises for student problem-solving activities. **Credit 3**
- 2065-356** **History and Aesthetics of the Moving Image: Fiction**  
An exploration of the history and aesthetics of film. Emphasis is on determining the unique characteristics of the medium, how those characteristics are used as a means of interpretation and expression, and their relevance to other kinds of nonverbal image making. (Second-year major or above) **Credit 3**
- 2065-357** **History and Aesthetics of the Moving Image: Documentary**  
An exploration of the history and aesthetics of film. Emphasis is on determining the unique characteristics of the medium, how those characteristics are used as a means of interpretation and expression, and their relevance to other kinds of nonverbal image making. (Second-year status or above) **Credit 3**
- 2065-358** **History and Aesthetics of the Moving Image: Animation**  
An exploration of the history and aesthetics of film. Emphasis is on determining the unique characteristics of the medium, how those characteristics are used as a means of interpretation and expression, and their relevance to other kinds of nonverbal image making. (Second-year status or above) **Credit 3**

- 2065-361 Introduction to 3-D Computer Animation**  
An introduction to three-dimensional computer animation. The basic principles of animation will be addressed within the context of producing three-dimensional computer animation. Students will produce a series of short three-dimensional computer animations as part of the learning process and then a final short three-dimensional computer animation of their own design. Students will become familiar with a variety of three-dimensional computer animation techniques and applications. (2065-331) **Credit 4**
- 2065-363 Acting for Animation**  
This course will give character animation students an opportunity to explore a visual language of acting and posing that will help their storytelling abilities. Acting, timing and pacing are critical elements to any successful character-animated film. Identifying and building a library of expressions, poses and movement for emotional and visual expression is the goal for each student. Students will study reference material from successful silent and animated films. They will also create their own reference material through acting and filming themselves and other students. The class will include demonstrations by practicing actors and animators. (Any basic animation class) **Credit 3**
- 2065-364 Film Theory and Criticism**  
A historical survey of film theory is offered, along with the analysis of films using specific critical methodologies. Provides the student with the viewing and discussion skills necessary to understand film as a fine art. **Credit 3**
- 2065-366 Scriptwriting for Animation**  
This is a writing seminar designed to provide intensive practice in developing premises, stories and characters in the particular idiom of animation. Readings, in-class exercises and outside writing assignments emphasize mining one's creative resources, developing fluency in the essential elements of storytelling for animation. **Credit 3**
- 2065-367 Visual Effects: Cinematography**  
This course is designed to enhance students' awareness of the creative possibilities inherent to the motion picture camera by giving them real-world work experience, concentrating on group dynamics within a problem-solving environment. The object is to produce a 16mm motion picture visual effects sequence by students. Students work cooperatively with each other within production units, and each production unit works cooperatively with the others. Students share their projects during weekly production meetings chaired by the instructor. Working with models and miniatures is included. (2065-203) **Credit 4**
- 2065-370 Film/Video in Paris, Summer**  
Provides students with the opportunity to creatively explore and experience film and video production for four weeks in Paris, France. Students study the rich history and prehistory of French (and European) cinema. Study includes weekly screenings of many historical and contemporary film works from the film archives at the National Museum of Modern Art in Paris, meetings with French/European filmmakers and historians, museum trips, special film programs at the Cinematheque Francaise and the Videothèque of Paris, and library research. Both traditional and experimental French cinema are examined. Equipment is provided. Students produce works in 16mm film and ½-inch video formats. Open to undergraduates and graduates, majors and non-majors, with or without production experience. (Course not offered every year) **Credit 6**
- 2065-371 Miniature Sets and Props**  
This course gives students hands-on experience in all stages of designing and building miniature sets. Common set construction materials will be introduced and proper techniques explained. Students will design and build basic structures with a variety of surface finishes using organic and artificial forms. Students will evaluate the artistic merits of their designs. Examples from architecture and movies will be provided. Realistic sets with a cultural heritage will be considered as well as fantasy environments. Final sets will be completed by the class for use in subsequent classes. (Instructor permission required) **Credit 3**
- 2065-372 Introduction to Stop-Motion Animation**  
Explore techniques for producing stop-motion animation. Gain familiarity with the use of a variety of materials that may include clay, puppet, foam and latex. Develop techniques for making armatures and skeletons and creating joints. Learn how to measure movement from frame to frame. Research and write about a stop-motion technique or animator. (2065-331) **Credit 4**
- 2065-373 Visual Anthropology**  
We see others as we imagine them to be, in terms of our values, not as they see themselves. This course examines ways in which we can understand and represent the reality of others through visual media, across the boundaries of culture, gender and race. It considers how and why visual media can be used to represent or to distort the world around us. (Second-year majors or above) **Credit 4**
- 2065-374 Seminar in International Film History**  
Examines selected, varying film topics in a wider sociohistorical context. Seminar themes change each year and may include topics such as post-war German films, films of the Holocaust, Japanese film, surrealist and magic realist film, Soviet film, Native Americans on film, etc. Students are expected to participate actively in the course via class presentations and discussions. **Credit 3**
- 2065-376 Dramatic Structure in Film and Television**  
This course explores the theories of dramatic structure from Aristotle to the present and applies these theories to current and classic dramatic works. The class also explores writing for film and television, including feature film genres, one-hour drama, mini series, soap opera, and sitcom. A segment on the business of writing covers reader's reports, adaptation of material from other media, and acquisition of rights. **Credit 4**
- 2065-377 Physical Expression in Animation, Film and Video**  
A course in nonverbal communication designed to broaden the creative vocabulary of animators, directors, editors and actors. Through a series of exercises and assignments, students will experiment with movement principles and gestured language. Analysis of these principles will be used to focus and refine their work during class and towards a final project. **Credit 3**
- 2065-378 Writing the One-hour Television Drama**  
A special workshop in writing the one-hour TV drama. Students study the format and structure of current one-hour dramatic programs, then propose and write an episode for an existing program. (2065-343) **Credit 4**
- 2065-381 Particle Effects**  
This course gives students the skills to insert three-dimensional computer special effects into animation and live action footage. Students explore three-dimensional computer particle animation and dynamic simulation using Maya software. In addition students will create short animations using particle effects, soft bodies and rigid bodies to simulate nature effects like fire, rain, and water and physics-based dynamic and collision events. MEL scripting is an integral part of this course. (2065-361) **Credit 4**
- 2065-382 Introduction to Digital Animation**  
An introduction to the techniques and practice of graphic and animated film production. This course provides training and practical experience in producing two-dimensional animated sequences using off-the-shelf multimedia software. Students produce a number of short exercises utilizing existing computer-created and non-digital original artwork. Topics include key frame and 'tweening, cycling, acceleration, squash and stretch, backgrounds, inking, rotoscoping, using sound, masking, multiplane effects, and space-to-time. Screenings of professionally made films will illustrate and provide historical perspective. Proficiency in drawing is not required. **Credit 4**
- 2065-383 Writing Comedy and Situation Comedy**  
A special workshop in writing the situation comedy. Using improv and stand-up comedy techniques, students study the rules of comedy and joke structure. Students also study the format and structure of current situation comedies, then propose and write an episode for an existing program. (2065-343 or permission of instructor) **Credit 4**
- 2065-384 DVD Authoring**  
This course is designed to introduce the design and practices of the DVD development with emphasis on rethinking a completed film project. The student develops a specific DVD based on a film they have completed. Class discussion and presentation is oriented towards new directions for the film story with interactivity and sequencing considerations. The student will acquire development tools to include: menu development, subtitles, audio streams, encoding principals, hybrid DVD creation, web linking (DVD@access), and basic scripting. (2065-203) **Credit 4**
- 2065-386 Film Sound Theory: Effects**  
A critical analysis of film sound theory through the study of texts and the viewing/listening of select films. A conceptual understanding of different elements of sound design will be obtained with close examination and focused group discussion. Lectures on the theory and practice of sound will be derived from the readings. (2065-203) **Credit 4**

- 2065-387 Writing the Short Film**  
A workshop in writing a short film script. The course focuses on story, proposal and script treatment as well as writing and rewriting a short script. (2065-343) **Credit 4**
- 2065-391 Programming for Artists and Animators I**  
This programming course is designed specifically for artists and animators with little or no programming experience. It is designed so that students are able to produce visual results from writing a program within the first two weeks of the quarter. All of the assignments and examples in class are graphics related. **Credit 4**
- 2065-392 Programming for Artists and Animators II**  
This second course in a two-course sequence gives students the ability to design custom tools and features in Maya by continuing to learn MEL. The course concentrates on algorithm development, leading to the development of MEL code useful for doing creative work in Maya. (2065-391) **Credit 4**
- 2065-396 Puppets for Stop Motion**  
Students will progress from simple to advanced puppet design through the class. At each stage, students will see a completed puppet, design and build one of similar design, and test animate the puppet. Students will use a variety of materials and will solve the problems of facial expressions, foot and rig attachment, and clothing. Reparability and usability will be stressed as well as artistic and expressive considerations. (2065-263) **Credit 3**
- 2065-398 Film and Video Community Service**  
Allows the student to take film or video production experience to the community. With the assistance of a faculty community service coordinator, community organizations and groups make contact with film and video majors for work toward the production of media necessary to the group's outreach, educational or promotional efforts. A final written report, screening of the community project and meeting with the faculty coordinator help the student evaluate the production and the experience. (2065-203 and permission of instructor) **Credit 4**
- 2065-413 Senior Project Seminar**  
A required course for third-year film/video majors and the prerequisite for 2065-507, Senior Project. Students discuss and generate a written plan for their senior film/video projects and select an adviser from among the film/video faculty. **Credit 1**
- 2065-418 Advanced Storyboard and Layout**  
This course involves creation of in-depth storyboard, production design and art direction for various media. Students will work on pre-designed characters as well as their own projects. Differing styles of layout, boarding and workbook will be explained. (2065-352) **Credit 4**
- 2065-427 2-D Computer Animation I**  
This class is intended to give students competency in the prevalent two-dimensional software. An understanding of computer graphic and video theory will be established as the foundation of software use. Raster paint software will be covered as a companion to animation software. Students will learn the structure of raster image and movie files, the paradigm of specific software designs, and issues inherent in common production pipelines. Students will learn specific task-oriented operations common in various animation approaches. (2065-331) **Credit 4**
- 2065-428 2-D Computer Animation II**  
This class is intended to extend student competency in two-dimensional computer animation software. Object-oriented software will be supplemented with plug-ins and paint animation software. A variety of source media, including live-action video and three-dimensional files, will be used. (2065-427) **Credit 4**
- 2065-437 Advanced Animation Workshop I**  
Students are given the opportunity to produce, either singly or in small groups, a motion picture with sound using an animation technique or combination of techniques of their own choosing. Students may elect to take this course for one or two quarters, depending upon the dimensions of the project. (2065-427) **Credit 4**
- 2065-441 Drawing Animation: Dynamics**  
Three different courses in drawing for animation are offered. Each course provides a different focus and assumes considerable drawing skill. This course focuses on the dynamics of drawn animation. Students explore the use of acceleration and deceleration, squash and stretch, maintaining volume, anticipation, secondary action, overlapping action, paths of motion, follow-through and exaggeration. Weekly assignments consist of rough pencil tests. A variety of examples of drawn animation will be screened in class. Gesture drawing from live models may be included. (Figure in Motion or permission of instructor) **Credit 3**
- 2065-442 Drawing Animation: Sequences**  
Three different courses in drawing for animation are offered. Each course provides a different focus and assumes considerable drawing skill. This course focuses on character animation in a group environment. Students will learn and draw common characters as well as create and work off of layouts. Students will exchange rolls as key animator, in-betweens and clean-up artists. (Figure in Motion or permission of instructor) **Credit 3**
- 2065-443 Drawing Animation: Characters**  
Three different courses in drawing for animation are offered. Each course provides a different focus and assumes considerable drawing skill. This course focuses on character development for animation of all kinds. Students produce character sheets and explore different perspectives of the character drawing from the imagination. Some animation will be done to reveal character personality. A variety of examples of drawn animation will be screened in class. Gesture drawing from live models may be included. (Figure in Motion or permission of instructor) **Credit 3**
- 2065-445 Acting II for Film and Video**  
An intermediate-level acting class working in depth with techniques and approaches introduced in the basic acting class with the additional focus of using external observation to determine appropriate behavior. Class meetings are organized around the presentation of scenes prepared by student actors and directors. The class is taught in conjunction with Directing the Actor II. (2065-345) **Credit 3**
- 2065-446 Directing the Actor II**  
This class offers in-depth study of techniques introduced in the basic directing class with an additional focus on using external observation to determine appropriate behavior. This course emphasizes the special problems peculiar to film and video production. Class meetings are organized around the presentation of scenes prepared by student directors using the acting students in the class. Meets in conjunction with Acting II for Film and Video. (2065-347) **Credit 3**
- 2065-447 Experimental Animation Workshop**  
Directed toward experimentation and exploration with single-frame motion image making. Students engage in creative conceptual and experimental investigation and processes to discover new expressions and techniques. This activity is not limited to film format and may include performance, installation, video, computer imagery, fine arts and photographic processes, nontraditional sound presentation, live action and more. Students study past experimental animated works and examine the definition and pretext for the experimental approach, the connections and relationships of experimental works to art, and the role of the experimentalist as discoverer and interpreter of new meaning. **Credit 4**
- 2065-452 Sound Recording**  
Specialized information and work in sound to give information and lab work beyond the regular course and to encourage the beginning of vocational-level work in sound. Each student prepares a mixed soundtrack to professional quality standards. **Credit 3**
- 2065-454 Writing the Feature I**  
A production workshop in developing and writing the outline for a feature-length film script or episodic TV series. Can also be taken by students who want to rewrite an existing feature-length screenplay. This course focuses on proposing a script and writing the outline for a feature film or TV series. Students work at their own level within the class, and discussions provide feedback and incentive. The project can be continued in Writing the Feature II. (2065-343) **Credit 4**
- 2065-455 Writing the Feature II**  
The second quarter of a scriptwriting workshop. Students complete and revise the script begun in the first quarter. Required as the second part of a two-quarter production class for students in the scriptwriting track. (2065-454) **Credit 4**

- 2065-457** **3-D Computer Animation I: Modeling**  
Beginning modeling for animation in three-dimensional software. Students learn modeling techniques that can be used in the three-dimensional animation course as well as the techniques of digital cinematography that are used to create and light a three-dimensional environment. (2065-331) **Credit 4**
- 2065-461** **Alternative Frame by Frame**  
This course will give all students a chance to explore three different approaches to stop-motion animation. The class will study and experiment with pixilation, relief animation with a "down-shooter," and cutout animation utilizing a composite approach. These techniques will expand any student's knowledge of traditional or character animation and present an alternative means of expression. Students can explore character or experimental approaches to animation with these traditional-alternative approaches. The class will study existing work with these techniques, analyze and discuss them with the instructor and then produce one 30-second example of their own for each approach. (2065-263) **Credit 3**
- 2065-462** **Advanced Sound Recording**  
Continuing the work in 2065-452 to include the decision level in the employment of various sound equipment, more complex work in multitrack recording and mixing. (2065-452) **Credit 3**
- 2065-464** **Business of Animation**  
This class is intended to give students an understanding of studio production and freelance animation. Students will learn the basics of running a business. Production issues, particularly related to animation, will be studied. Methods of examining costs and projecting work timelines will be practiced. Students will draw up contracts and negotiate terms. Copyright law as it applies to distribution and contracts will be studied. A business plan will be developed by each student. (Junior or senior status) **Credit 2**
- 2065-466** **Lighting for Film and Video**  
This course will present the fundamental principles of lighting for film and video production. Current methods and practices of lighting used in the motion picture industry will be explored through demonstration, lectures and hands-on lab assignments. (Junior or senior status) **Credit 3**
- 2065-467** **Digital Effects and Compositing**  
This course offers a hands-on experience in manipulating live-action video and applying digital effects. There is an emphasis on digital compositing using alpha channels and transparency. Composites may be accomplished through green screen shooting, transfer modes, masks and/or traveling mattes. (2065-331) **Credit 4**
- 2065-469** **Digital Video Postproduction**  
A hands-on tutorial in using Avid Media Composer 1000s for digital video postproduction. Emphasis is on the three major stages of the process: digitizing/DV file transfer, editing/mixing, and writing back to a distributed medium. Students learn how to edit, manipulate, add effects, mix and composite their source material into a finished fine-edit product. Students use stock media for the exercises and then produce a short finished production of their own design. (2065-311 or permission of instructor) **Credit 4**
- 2065-471** **Gesture Drawing for Animators**  
This course will consist of intensive anatomy and quick-sketch workshops using live models and reference from videos, Internet and print sources. Live models, both human and animal, will be scheduled for a portion of each class. Students will study kinesiology, the effect of movement on muscle and bone, and comparative anatomy. As a final project students will create original imaginary characters based on their class assignments. Most of the course work will be in-class drawing sessions. (2013-211) **Credit 3**
- 2065-472** **Advanced Stop-Motion Animation**  
Explore advanced techniques for producing stop-motion animation. Gain familiarity with the use of a variety of materials, which may include clay, rubbers, aluminum, and more. Develop techniques for making armatures using wire and steel joints. Learn character performance in gesture and expression. Practice methods of miniature lighting and photography as well as digital effects. **Credit 3**
- 2065-473** **Women's Stories, Women's Films**  
This course provides an introduction to women's films. Through screening films and class discussion, the course examines the themes and issues of women's narratives and how they function in the medium of film. The hero's journey and traditional narrative structure are contrasted with the heroine's journey and the more personal feminine storytelling style. The course also considers differences in films made by women and films made by men about women. Students will have an opportunity to explore their own creativity. **Credit 4**
- 2065-478** **3-D Computer Animation II: Character**  
An introduction to three-dimensional digital character animation. The basic principles of character animation and development will be addressed within the context of producing three-dimensional digital character animation. Students will produce a series of short three dimensional computer animations of digital characters using inverse kinematics as part of the learning process. Then they will produce a final short three-dimensional digital character animation of their own design. Students will become familiar with a variety of three-dimensional digital character animation techniques and applications. (2065-361 and 2065-457) **Credit 4**
- 2065-498** **Film and Video Internship**  
Provides the students with on-the-job experience in the field of film/video. The student seeks and acquires a school-approved internship position in a business or industry. The working environment provides the forum for learning more about the student's chosen career. A final interview with the internship coordinator assists the student in evaluating the experience. The coordinator should be the faculty member most familiar with the student's internship field. (Permission of internship coordinator) **Credits 1-6 per quarter**
- 2065-507** **Senior Project I**  
In this course students in their final year begin work on a major project. Students work on projects, including narrative fiction, documentary, experimental, animation, scriptwriting or craft that were proposed and approved in the spring quarter of the previous year. Students are in charge of their own work, but they work directly with an adviser to track their progress on the project. At the end of this quarter, students should have completed the tasks laid out in their project schedules. The first in a three-part sequence. (2065-413 and departmental approval) **Credit 4-6**
- 2065-508** **Senior Project II**  
Work on the senior project continues. The student will meet at least once a week with his/her faculty advisor. At the end of the quarter, students screen their work for faculty and peer feedback. The second in a three-part sequence. (2065-507) **Credit 4-6**
- 2065-509** **Senior Project III**  
Students complete work on their senior project, creating appropriate distribution media or other appropriate publishable material. Craft students complete their contributions to projects, and prepare and give a presentation to the public. Scriptwriters rewrite their scripts and give a formal script-reading for the public. Experimentalists refine and complete experimental projects and prepare for final exhibition/performance and distribution. Rationale: Variable credits allow students to match credits to the workload for this quarter. The third in a three-part sequence. (2065-508) **Credit 2-4**
- 2065-512** **Senior Forum**  
This course is intended to accompany and complement the department's Senior Project 2 course. Students in this course will meet as a group to screen edited works in progress, discuss postproduction problems and plan jointly for the use of departmental production resources. (2065-507) **Credit 2**
- 2065-513** **Career Preparation**  
Career Preparation offers practical advice and assistance in job seeking and life after RIT. The course aids students in preparing their thesis projects for festival entry and distribution. Material produced by the student includes a résumé, portfolio and work reel. (2065-512) **Credit 2**
- 2065-550, 551, 552, 553** **Special Topics**  
A seminar approach offered on demand when adequate numbers of students and faculty desire to investigate specialized topics not normally offered in the regular curriculum. Available to upper-level students. **Credit variable 1-9**
- 2065-563** **The Business of Hollywood**  
In this interactive role-playing course, students become studio executives, producers or agents. Participants learn the techniques of identifying movie concepts and selling ideas, the specifics of talent compensation and the structure of the Hollywood studio system. Most important, perhaps, students learn methods of negotiation in the film industry and gain an understanding of what it takes to succeed in this business. If you have ever contemplated a career in show biz, take this class and think again! (Online course) **Credit 3**
- 2065-599** **Independent Study**  
A student-proposed advanced project sponsored by an instructor. Approval of the proposal by a faculty sponsor and the administrative chairperson of the school. Available to upper-level students with a GPA of 3.0 or greater. **Credit variable**

# School of Photographic Arts

2060-257

## Still Photography I

Students become familiar with the 35mm camera, processing and printing. The work is restricted to black-and-white photography. The aesthetics and basic understanding of photographic practice are covered. This course is available for students who are not majoring in photography. **Credit 3**

2060-258

## Still Photography II

A basic studio course for the hobbyist or someone who occasionally uses photography in his or her work. Ideas for portraiture, both of one person and then of two people, are discussed and explored in a casual (rather than commercial) manner. The idea of self-portrait is also discussed and explored. (2060-257 or a working knowledge of developing film and making black-and-white enlargements) **Credit 3**

2060-259

## Still Photography III

A course in which students determine their own theme of expression using black-and-white photographs. (2060-257, or working knowledge of developing film and making enlargements, and 2060-258, or permission of instructor) **Credit 3**

2060-301, 302, 303

## History and Aesthetics of Photography

Series of courses that covers the history and aesthetics of photography from 1800 to the present, with special emphasis on the development of photographic seeing and its related effect on other media. This is also a survey of the numerous processes and how their development affected the image making of particular periods; i.e., daguerreotypes, collotypes, ambrotypes, etc. Visual lectures cover topics from surrealism and documentary to conceptual art and post-modernism. **Credit 3**

2060-368

## Digital Diary

A creative exploration of the possibilities of digital imaging in making a visual account of personal experience. Assignments will focus on a variety of ways to photograph, record, document and illustrate everyday life. Strategies for editing, sequencing, reproducing and displaying digital images will be examined. Students will expand their knowledge of image manipulation software considerably and employ various methods of soft display and printed output. (Photo Arts 1 through 6) **Credit 4**

2060-401, 402, 403

## Photography as a Fine Art I

The major emphasis is on the individual's learning to identify and articulate a personal response to his or her environment through the medium of photography. Students design their own projects and work under the guidance of the professor. Digital analog silver mixed media and non-silver photographic techniques may be utilized. Weekly critiques are a focus activity of each course. **Credit 4**

2060-411, 412, 413

## Contemporary Issues

Course offerings are examinations of many thought-provoking/controversial issues in photography, from 1950 to the present, through a series of lectures, readings and discussions. Topics include post-modernism, genderism, pornography, censorship, altered images and connoisseurship. The course format allows review and exploration of such themes as the landscape, the nude, portraiture, conceptual art, trompe l'oeil, and so on. Students prepare an oral debate or a written term paper. **Credit 4**

2060-464

## Art and Censorship

Students will analyze and debate the art and issues propelling censorship in the arts, beginning with the 1989 cancellation of the Mapplethorpe show by the Corcoran Gallery and continuing through the present debates. Students will view and discuss the artworks of this period as well as historic art, ideas and events that have generated censorial conflict. Students will investigate censorship in terms of the underlying, opposing social values that define American culture. (Third- or fourth-year status) **Credit 4**

2060-468

## Media Art and Principle Positions

Students will investigate the development of time-based media art and its evolution from photography, sculpture, dance, performance and writing. Students will explore work of significant contemporary and historic artists through the Media Cafe collection. They will research the various strategies artists developed through the '60s to the present as this new perceptual tool helped create significant social change. At the end of the quarter, students will present portions of their research, papers and selections from the collection in the Media Cafe during the final week of class. (Third- or fourth-year status) **Credit 4**

2060-476

## Moving Media I

Students taking this tools course will work with still photographs, electronic images, video footage and camera-recorded sound to create new work that merges the disciplines of photography and video. Students will use media software to produce work that weaves photography and video into electronic canvases. Students will explore nontraditional narratives, conceptual constructions and performance. They will work with traditional photography processes, electronic media and projection equipment to create and display their projects. Each student will produce a final project for public presentation in the Media Cafe during the final week of class. (Photo Arts 1-6) **Credit 5**

2060-477

## Moving Media 2

Moving Media 2 continues Moving Media 1 as students work with electronically produced imagery to develop advanced technical skills. Students bring their intellectual studies into practice with a mastery of complex editing techniques and the introduction to sound recording and sound editing techniques. Students work on assignments and self-generated projects, view contemporary work, and analyze the various strategies artists use to convey their values and ideas. Each student will produce a final project for public presentation in the Media Cafe during the final week of class. The work of each student will be stored in the Media Cafe collection at Wallace Library. (2060-476) **Credit 5**

2060-478

## Moving Media 3

Students taking this seminar course will continue their work with still photographs, electronic images and video footage to create new work that moves across the disciplines of photography and video. The course emphasizes the preparation and manipulation of media to materialize the students' growing understanding of the significance of electronic art in the information era. Students will design and produce quarter long projects. They will work with installation and non-traditional exhibition environments. Students taking this course will analyze and interpret the work of contemporary artists. They will develop a meaningful practice of critique and evaluation as they develop a body of research and writing that supports their critical, analytical and interpretive skills. (2060-476) **Credit 4**

2060-501, 502, 503

## Photography as a Fine Art II

Emphasis is on students setting goals, selecting themes and projects, and expanding their work on their own terms. Lectures and experiences are oriented to encourage awareness of shared concepts in the other arts, goals set by working artists, and the relevance of the history of the visual arts to the student's work. Weekly critiques are a focus of each course. (2060-403) **Credit 4**

2060-550, 551, 552, 553

## Special Topics

Topics of current or special interest designed to broaden and intensify the student's ability to use photography as a means of communication and expression. **Credit variable 1-9**

2060-554

## Gallery Management

A basic, hands-on course in art gallery operation, to include gallery management, lighting, planning, publicity and aesthetics. Course work is done with actual shows in the SPAS photo gallery and other local galleries where appropriate. **Credit 3**

2060-556, 557, 558

## Photo Media Workshop

The course emphasizes visual problem solving using alternative (non-silver) photographic processes. The first quarter features work with emulsions on various surfaces, the second deals with visual books, and the third quarter covers generative systems, including electrostatic, offset printing and other methods of altering images. The series is best when taken in order, but students may join in at any quarter. (Third- or fourth-year status) **Credit 4**

2060-566, 567, 568

## Color Photo Workshop

Emphasis is on the creative and aesthetic aspects of color photography and other color imaging systems. Students are provided with an opportunity to explore the variety of ways in which color photographs can be produced, reproduced, sequenced, displayed and preserved. A personal portfolio of work presented as color prints, color transparencies, a slide presentation, and an exhibition, or as an art book, is required for each quarter. (Third- or fourth-year status) **Credit 4**

2060-599

## Independent Study

Learning experiences not provided by formal course structure may be obtained through use of an independent study contract. Approval of the proposal by the department chairperson is required. Available to upper-level students with a GPA of 3.0 or greater. **Credit variable 1-9**



## Biomedical Photography

**2061-201** **Biomedical Photography I**  
The first of a three-quarter sequence of study in the fundamentals of photography, with emphasis on the development of strong photographic skills as they relate to the principles of 35mm camera optics, choosing and using perspective, lighting, and related aspects of darkroom skills. Principles of creativity, craftsmanship, applied photographic theory and visual communication and presentation will be used to support the foundation theme of using cameras as a tool used in problem solving for technical and visual communications. **Credit 6**

**2061-202** **Biomedical Photography I**  
The second course of a three-quarter sequence of study in the fundamentals of photography, with emphasis on the development of strong artificial lighting skills as they relate to working in the studio. Principles of creativity, craftsmanship, applied photographic theory and visual communication and presentation will be used to support the foundation theme of using 4x5 cameras. (2061-201) **Credit 6**

**2061-203** **Biomedical Photography I**  
The third course of a three-quarter sequence of study in the fundamentals of scientific photography, with emphasis on the development of enhanced skills as they relate to working as a scientific photographer. Principles of creativity, craftsmanship, and applied photographic theory as used in the presentation of subject matter relevant to the life sciences industry will be incorporated as part of the foundation for future biomedical photography experiences, where appropriate. (2061-202) **Credit 6**

**2061-213** **Survey of Biomedical Photography**  
Following graduation, there are a variety of career directions a BPC graduate might consider as a consequence of the diverse curriculum that has been completed. Survey of Biomedical Photography is one of the program's original courses dating back to 1969. Alumni from various industries are invited to campus and share their careers through an interactive lecture class required for all biomed majors. **Credit 1**

**2061-221** **Photography with Digital Technology I**  
This course explores the traditional experiences found in photography with the sophisticated tools of the dynamic digital age using a range-finder digital camera. Students experience approaches to the conceptual process required in the making of photographs as an integrated activity of their imagination. They create visual solutions using the electronic world and its technology to reveal craft and successful delivery of ideas in applications such as real estate, small businesses and marketing. (Must have access to a film or digital camera) **Credit 4**

**2061-276** **Fundamentals of Science Photography I**  
This is a basic photography course for non-photography majors that emphasizes theory, craftsmanship and visual communication based in technical photography. Forensic, medical, biological and other relevant subject matter will be incorporated into this foundation course. Students will explore camera operation and lens selection, depth-of-field relationships, exposure meters, choosing and using image processing and supplementary artificial light sources. (A strong interest in learning and applying technical approaches to making photographic images for science, forensics and other technical disciplines) **Credit 4**

**2061-301** **Biomedical Photography II**  
A three-quarter sequential course that explores approaches and techniques required in the production of communication media used in the life sciences industry. The emphasis will be placed on developing skills and approaches used in close-up photography as well as photomicrography. The course uses all formats as well as film and digital capture. In the winter, students are exposed to illumination and optical considerations required to use a microscope. This quarter culminates in the production of an educational poster featuring a subject that has been researched using the microscope. Spring investigates the use of electronic flash as a light source found in the life sciences community. Students are exposed to ophthalmic, surgical, dental, environmental, and close-up photography. The final project integrates images into an educational poster. (2061-203) **Credit 5**

**2061-302** **Biomedical Photography II**  
In this second sequence students are exposed to illumination and optical considerations required to operate and photograph with, a light microscope. Producing Kohler illumination, controlling the physics of light, and following scientific method are explored as core activities. The final project requires the production of a large educational poster featuring one microscope subject that has been researched and photographed using the microscope. (2061-301) **Credit 4**

**2061-303** **Biomedical Photography II**  
In the third sequence students investigate the electronic flash as a light source when applied to various situations found in life sciences community. Students are exposed to ophthalmic photography, surgical photography, dental photography, as well as location and public relations assignments. The class final project is a capstone assignment exploring concepts and techniques required in the design and production of instructional media. (2061-301, 2061-302) **Credit 4**

**2061-311** **Preparation of Biomedical Visuals I**  
The first course delivered over a two-quarter sequence that will study the basic principles required for the generation of effective visual communication specific to the life sciences field. The emphasis will be on choosing and using the correct technology for visuals, including aspects of fundamental design required in such a dynamic delivery environment. Assignments have been designed to emphasize the appropriate techniques for producing visuals that exhibit effective design necessary for reproduction using either traditional mechanical or electronic methods. **Credit 3**

**2061-313** **Preparation of Biomedical Visuals III**  
This course will study the basic principles for the generation of effective desktop publishing specific to the life sciences industry. The emphasis will be on choosing and using the correct technology for visuals, including aspects of fundamental design required for electronic publishing. Students will be exposed to specific core principles required to produce electronic pieces, including effective résumés, posters, brochures and flyers. Assignments have been designed to emphasize the appropriate techniques for producing these visuals, which exhibit effective typography necessary for reproduction using electronic methods. (2061-311) **Credit 3**

**2061-316** **Digital Media in Biomedical Photography I**  
Electronic media is quickly replacing traditional photography on many fronts in the life sciences industry. Digital Media in Biomedical Photography is a two-course sequence that explores all aspects of digital media from concept development through production of final product. The first course will examine significant issues found in electronic imaging activities driven by budget, hardware, software and production issues. Students will execute practical assignments in the production of educational support materials found in a variety of digital media areas, including image capture, processing, hard-copy output and color management. **Credit 4**

**2061-318** **Digital Media in Biomedical Photography II**  
This is the continuation of a two-course sequence that explores digital media from concept development through final product. The course will examine significant issues found in electronic imaging activities driven by budget, hardware, software and production issues. Students will execute practical assignments in the production of educational support materials found in a wide variety of digital media areas, including interactivity, online documents, digital posters, user interface design, website production, basic two-dimensional animations and speaker-support materials. **Credit 4**

**2061-354** **Basic Ophthalmic Photography**  
Investigates proper patient management and camera/photographic techniques in ophthalmic photography. Diagnostic evaluation of ocular anatomy and physiology utilizing special cameras is presented. (2061-301, 302, 303 or permission of instructor) **Credit 4**

**2061-357** **Principles and Technology of Photomacrography**  
A condensed course in photomacrography will examine equipment used and the technical considerations necessary in the photography of subjects 1:1 thru 20:1. Lighting, optics, camera technique and other considerations will be evaluated in the theory and practice. Students will be exposed to interesting problems and lighting equipment not found in other types of photographic work. Many assignments will explore using software to improve where DOF (depth of field) is impossible to achieve. (Completion of first year) **Credit 4**

**2061-361** **Web Design Using Photography**  
Photographers have always communicated visually. The accessibility of the World Wide Web creates a potential audience of millions. This course explores the nature of the World Wide Web, websites and the process of designing, building and maintaining these sites for business or other applications. Students will explore the use of images and media as they relate to the Web, including bandwidth and quality considerations. Interactivity, design, structure, viability and the successful delivery of ideas will be emphasized. Some quarters, this course is delivered through distance methodology and culminates in individual student websites as the course final project. **Credit 4**

**2061-401 Audio-Visual Production I**  
The field of information delivery has changed significantly. This course is designed to explore concepts and software required for the production of desktop multimedia. Students explore concepts of scriptwriting and crafting educational objectives as well as the production of multimedia. **Credit 4**

**2061-402 Advanced Photography in Biomedical Communications**  
This course explores sophisticated and creative applications of photography serving the needs of the scientific community. Students explore a variety of specialized photographic techniques and a variety of philosophies. Assignments are performed that are similar to those encountered in biomedical and research institutes. (2061-303, basic color course) **Credit 4**

**2061-454 Intermediate Ophthalmic Photography**  
Intermediate Ophthalmic Photography goes beyond the shooting of retina fundus photographs or posterior segment photography and concentrates on interpretation of fluorescein angiography films and anterior segment photography. Students investigate external ocular photography, slit-lamp biomicrography, and common corneal anatomy and diseases. (2061-354) **Credit 4**

**2061-455 Advanced Applications in Ophthalmic Photo**  
Provides students with clinical experience in ophthalmic photography. Students work off campus in an ophthalmology clinic performing stereo fundus photography, fluorescein angiography, specular biomicrography, slit-lamp biomicrography and gonioscopy. The educational experience is balanced with the needs and tolerance of each patient involved and represents an important clinical education necessary for diagnostic imaging. Students are responsible for their own transportation to and from the site. (2061-354 and permission of instructor) **Credit 4**

**2061-463 Photography and the Microscope**  
This photomicrography course goes beyond the basics of imaging through a microscope, investigating optical enhancement techniques, video recording and motion stopping as well as specimen preparation in various applications and sample preparations. (2061-302 or 2076-412 or permission of instructor) **Credit 4**

**2061-499 Biomedical Photography Co-op**  
Provides biomedical photographic communications students with on-the-job experience. The student seeks and acquires a school-approved co-op position in the health-care industry. The working environment provides the forum for learning more about the student's chosen career. A final interview with the co-op coordinator assists the student in evaluating the experience. **Credit 0**

**2061-501 Photography Concentration**  
Investigating, planning, organizing and producing an audiovisual presentation, a learning package or an informational program for a biomedical communications client. (Completion of Biomedical Photographic Communications AAS degree requirements, at least one upper-division photo elective in media, permission of instructor) **Credit 4**

**2061-550, 551, 552, 553 Special Topics**  
A seminar approach offered on demand when adequate numbers of students and faculty desire to investigate specialized topics not normally offered in the regular curriculum. Available to upper-level students. **Credit variable 1-9**

**2061-599 Independent Study**  
A student-proposed advanced project sponsored by an instructor. Approval of the proposal by the department chairperson and the director of the school. Available to upper-level students with a GPA of 3.0 or greater. **Credit variable 1-9**

## Photographic Arts

**2067-201, 202, 203 Applied Photo I**  
An introduction to the major in applied photography that will give the student broad experiences in various areas of photography and assist in making program decisions and practicing visual communications. The curriculum emphasizes both craft and visual problem solving. **Credit 6**

**2067-263 Studio Light**  
A lighting workshop course that uses visual exercises to teach students how to evaluate light conditions outside and to control and reproduce those conditions in the studio. (2067-201, 202) **Credit 5**

**2067-264 Introduction to Photography for Non-photo Majors**  
An introduction to still photography—principles, methods, theory and practice—for non-photography majors. This course will familiarize the student with the basic skills of still photography. The darkroom is not used in this course designed to introduce students to the operation of their camera, flash and accessories; film selection and exposure variables; light, filters and basic tone control. Photographic aesthetics/composition, history, contemporary artists, professional applications, and other nontechnical aspects of photography will be addressed through weekly lectures and critiques of photographic shooting assignments. Students are required to have their own adjustable camera and flash unit. Each student will provide his/her own film and processing. Non-photography majors only. **Credit 4**

**2067-278 The Spiritual and Mystical Image**  
Guides the student toward a tangible perception of a higher self that is compatible with our established perceptions of ourselves as artists. Three major areas to be integrated are self, intellect and spirit. Emphasis on realist and contemporary possibilities and self-discovery through imagination. **Credit 5**

**2067-301, 302, 303 Applied Photo II**  
Advanced applied photography in black-and-white and color with emphasis on craftsmanship, problem solving and visual communications. Major technical emphasis and introduction to studio electronic flash and large-format photography. Further emphasis is placed on the development of the student's ability to apply creative thinking and contemporary techniques in executing meaningful and effective photographs. (2067-202) **Credit 5**

**2067-363 The Zone System and Fine Print**  
A one-quarter introduction to the fundamentals of the zone system and fine print, using black-and-white photography. Purpose, technique and aesthetics of the system and printing are the content of the course. Emphasis is on large-format technique. (2067-201, 202) **Credit 5**

**2067-364 Art Direction and Copy I**  
A study of art direction and copy writing with emphasis on conceptual thinking as it applies to the photographic image. Some emphasis is placed on basic hand skills; i.e., layout, type rendering and paste up. Marketing principles and career possibilities are covered. (Photo student or permission of instructor) **Credit 5**

**2067-388 Picture Editing and Layout**  
Image selection, usage and design for the printed page. Using images from sources other than your own photographs, we discuss picture selection relative to context and desired impact and how to effectively design the page(s) upon which the image(s) exist(s). Techniques such as scaling, proportion and sizing are related to page design. We discuss typography and its function with photos, including captions and block text. Students lay out a number of assignments from single pages to essays of varying length. A variety of picture sources is used. A student need not use his or her photos in this course. (Second-, third-, or fourth-year status) **Credit 5**

**2067-401 Photojournalism I: Photo as a Narrative**  
This course will explore the use of the photographic image in narrative, documentary and editorial form. Issues of public need and publication will be addressed. The emphasis during the first quarter of photojournalism is a personal one. It is simply about the photograph. It is about the act of photographing, and it is about being a photojournalist. (2067-302 or equivalent) **Credit 5**

**2067-402 Photojournalism I: Editorial on Location**  
This course is about photographing editorial assignments on location. The assignments will have special technical controls required to strengthen the student's skills of photographing people on location. Particular emphasis will be on the control of color and lighting. The editorial assignments are designed to be appropriate for major mass-market general news and special-interest consumer publications. In addition, it is expected that these assignments would satisfy the requirements of many of the major picture agencies, both in the USA and foreign markets. (2067-302 or equivalent) **Credit 5**

**2067-403 Photojournalism I: Photography for News**  
This is a course about photojournalism with specific emphasis on photography for a daily metropolitan newspaper. Students will be required to photograph according to newspaper standards and needs on a weekly basis. This photography will include spot news, general news, features, sports, editorial portraits and photo essays. Aspects of journalism such as story ideas, research and visual execution will be addressed. Students will be required to write captions for all photographs and generate text to support photo essays. The legal and ethical issues of photojournalism will be researched. (2067-402 or equivalent) **Credit 5**

- 2067-411 Advertising Photography I**  
A course in visual problem solving with photography. Studio and other controlled environments are stressed. Advertising and editorial solutions and applications are explored. The skills involved with both product rendering and concept illustration are covered. (2067-302) **Credit 5**
- 2067-413 Photography Business Management**  
A one-quarter business survey course for all applied department students but required for advertising photography majors. This course will cover business concepts necessary for the operation of a small studio or freelance business on a practical level beyond the basics covered in Advertising I and II. Job search methods, self-promotion, bookkeeping and legal aspects of business will be addressed. (Advertising photography major or instructor permission) **Credit 3**
- 2067-451 Advertising and the Fine Arts**  
This course will examine aspects of different traditions, styles and movements of the fine arts: painting, sculpture, dance and theater. We will look at how these disciplines relate to images created for editorial and advertising art. The class will draw on these art forms for inspiration for the images we produce in this class, both photographic and non-photographic. Field trips to local museums, theaters and concerts will be funded by each student. (2067-412) **Credit 5**
- 2067-453 On-Location Photography**  
Covers the techniques and equipment necessary to complete an on-location assignment for a corporate report, brochure or audiovisual presentation. Students are encouraged to meet professional standards while developing a strong personal point of view. (2067-302 or equivalent) **Credit 5**
- 2067-457 Propaganda and Photography**  
"PROP-A-GAN-DA", N. The particular doctrines or principles propagated by an organizational or concerted movement. The dissemination of information from a particular point of view." Course examines photographs and films that have shaped our view of the world and explores the positive and negative effects of such images. The period from the Crimean War to the present is covered. Special emphasis is placed on World War II, where propaganda was used in the extreme for both good and evil. Still photographs, including those in the professor's collection—some of which are faked photographs—are studied. The larger question is "Why were these photographs faked?" Included in lectures are the historical and cultural forces behind the work. **Credit 4**
- 2067-458 Food**  
Instruction covers basic means and methods of preparing a food photograph: shopping for the proper ingredients; consulting and working with prop and food stylists/chefs/home economists; how the approach to a food photograph differs from other photographic assignments. Students learn the basic methods of preparing food for photography as opposed to food for eating. Assignments range from simple raw-ingredient shots to pour shots to building a sandwich to making a salad. (Third- or fourth-year status) **Credit 5**
- 2067-461 Editorial Photography**  
The editorial photography course is an investigation into images that are created to illustrate magazine articles. Students will have the option of working with still life, people, location, documentary and/ or fashion photography. Current events will be discussed for "picture possibilities." The majority of the assignments will be done in collaboration with students in the graphic design department. Historical and contemporary studies of layout and style will be examined. (2067-412) **Credit 5**
- 2067-464 Contemporary Portrait Photography**  
Brings together the skills of the first two terms and encourages the student to develop a personal approach to portrait photography through a term-long, self-directed project. **Credit 4**
- 2067-465 XI-Summer Advertising Core**  
A five-week intensive summer course that allows students to work for extended periods of time in the studio on projects that are self-generated but deal with subjects/topics related to advertising, editorial and fine-art photography. Students are granted the conditional use of their own personal studio for the duration of this course. Marketing techniques and analyzing student portfolios are integral to the course. (2067-302 or permission of instructor) **Credit 6**
- 2067-466 Lighting: Manipulation and Controls**  
This course deals with the control and manipulation of light. We will light people, locations and things in ways that will bring out and enhance our photographic intentions, whether for advertising, editorial or problems of personal expression. In-depth studio demonstrations will be a particular feature of this course. (2067-302) **Credit 5**
- 2067-467 Digital Photo Workshop**  
This workshop is a creative exploration of the basics of the hybrid technology between traditional film-based photography and digital imaging. Students will use film as well as digital cameras for image capture, gain knowledge of proper color management techniques, considerably expand their knowledge of image editing software, and employ various methods of soft display and printed output. (Photo Arts 1 thru 6) **Credit 4**
- 2067-469 Environmental Portraiture**  
A course involving the selection of various persons as subjects and learning of their skills and specialties. The student interviews subjects, defines what they do and where they do it, and designs a photograph that shows the viewer the subject's job or avocation and the environment in which the subject operates. (Upper-level photography major) **Credit 5**
- 2067-471 Advertising and Design Photography**  
This course teams photographers and graphic designers in the production of advertising layouts/campaigns, posters and brochures. Students have the option of working with still life, people, location, and/or fashion photography. Current advertising campaigns will be discussed and analyzed. Emphasis will be on producing multiple or sequential images. Historical and contemporary studies of layout and style will be examined. (Advertising photography major or permission of instructor) **Credit 5**
- 2067-473 Portfolio Development**  
Designed for third- and fourth-year students who are ready to present themselves and their work to potential employers. Weekly assignments move students closer to their stated goals. To begin this course, students must be able to answer two career-related questions: What is it they wish to do, and where do they wish to do it? **Credit 5**
- 2067-478 Architectural Photography**  
An image-making course for advanced students with a specific interest in architectural exterior and interior photography. Assignments are designed to emphasize the development and exploration of professional techniques and styles. (Completion of second-year courses or permission of instructor) **Credit 4**
- 2067-483 Introduction to Fashion Photography**  
This is a course that provides advertising students basic experience in fashion photography. Students will be taught the concepts, aesthetics and processes of fashion work, casting and directing the model, studio and location shooting and ethics (especially with regard to women's issues). Digital imaging, including both capture and postproduction, will form an integral part of the course. (2067-302) **Credit 5**
- 2067-488 People Illustration/Studio**  
Advanced study of people photography focusing on the development of the photographic and social skills of the studio photographer. Learning to orchestrate the tangible and emotional studio environments is a major goal of the course. Studio lighting, camera techniques and the selection and direction of models are the subjects of lectures, demonstrations and assignments. Many of the course assignments are open ended, which gives the student freedom to generate independent projects. (2067-411, 412 or permission of instructor) **Credit 5**
- 2067-493 Problems and Projects/Still Life**  
The still life as a medium for creative expression and visual experimentation. The tools and techniques particular to the still-life photographer are investigated and demonstrated. The special manipulations possible—lighting, perspective, camera angle, surface propping, set rigging, multiple exposure, front projection and other esoteric techniques—are discussed, demonstrated and applied to assignments. Projects are in a practical vein, relating to actual typical problems that are part of a working studio's daily life. Assignments investigate the overlapping relationships of fine art, editorial and commercial still-life photography. Large- and small-format cameras may be used; assignments are done both in and out of the studio. **Credit 5**
- 2067-512 Visual Media Capstone**  
Students will submit a proposal for a major project incorporating their visual media focus as well as photography. Faculty from two disciplines will sponsor the research and development of the final project. This activity will be a demonstration of students' capabilities in their chosen areas of study. The project will be designed, developed and completed during the quarter. Completed projects will constitute a substantial portfolio piece. (12 credits of Visual Media Focus required) **Credit 4**

**2067-550, 551, 552, 553** **Special Topics**  
Advanced topics of current or special interest, varying from quarter to quarter, selected from the field of professional photographic illustration. Special topics announced in advance. (Not offered every quarter. Consult coordinator of the professional photographic illustration program.) **Credit variable**

**2067-554** **Advanced Digital Photography**  
This lecture and laboratory course gives the advanced student of electronic photography an in-depth look at the tools and techniques of electronic imaging systems. Students pursue research projects in either visual communications or technical aspects of electronic photography. Each student's final project is self-defined. (2067-475 or permission of instructor) **Credit 4**

**2067-582** **Production Photography**  
This course is about the storytelling side of professional illustration. Assignments for the course will include recreating historical events, inventing futuristic scenes, creating believable period pieces—all with an emphasis on narrative illustrations. In the process we'll introduce the skills, concepts and preparation required to shoot still-life and model photography in the studio and on location. Students work as production teams to simulate the professional production environment. (2067-411, 412 or instructor's permission) **Credit 5**

**2067-599** **Independent Study**  
A student-proposed advanced project sponsored by an instructor. Approval of the proposal by the department chairperson and the director of the school. Available to upper-level students with a GPA of 3.0 or greater. **Credit variable 1-10**

## Imaging and Photographic Technology

**2076-200** **Photography I-JPHT/JPHB**  
An intensive 10-week summer course for students entering the transfer programs in biomedical photographic communications and photographic technology. This is the minimum photographic education needed to gain entry to second-year standing and replaces 2061-201, 202, 203 and 2076-201, 202, 203. Since this is such an intensive offering, previous photographic experience is highly advisable. **Credit 12**

**2076-201, 202, 203** **Photography I**  
An intensive three-quarter sequence concentrating on the fundamentals of black-and-white and color photography. Small-, medium- and large-format cameras are utilized as problem-solving tools, beginning with 35mm and 4x5 in the first quarter. Professionally equipped upper-class studios are used all three quarters as well as black-and-white labs and color printing in the third quarter. Principles of creativity, craftsmanship, visual communication, presentation, preproduction planning and postproduction analysis are taught. Concepts learned in Materials and Processes of Photography are put to practical application in this class. **Credit 4**

**2076-210** **Materials and Processes of Photography**  
An intensive 10-week summer course for students entering a transfer program in biomedical photographic communications or imaging and photographic technology. Replaces 2076-211, 212, 213. (Either this course or the 2076-211, 212, 213 sequence is also a requirement in the professional photographic illustration program.) **Credit 6**

**2076-211, 212, 213** **Materials and Processes of Photography**  
Basic study of the technology of photography, with the emphasis on applications to real photographic problems. Among the topics are image formation and evaluation, photosensitive materials, exposure, processing, tone reproduction, visual perception, color theory, variability, quality control and photographic effects. An approved independent study project is required. **Credit 3**

**2076-301** **Photographic Sensitometry**  
This is a course about quantitative photographic image quality. The photographic imaging system, from light source to output, will be investigated, component-by-component, for the effects each has on system image quality. Students will characterize the image quality of various photographic components, such as exposure, film, paper and processing. Input-output relationships for each component subsystem will be investigated. Component responses will be collectively used to determine system image quality (based on tone reproduction). Related topics, radiometry, photometry and color sensitometry will also be covered. (2076-201, 202, 203; 2076-211, 212, 213) **Credit 4**

**2076-302** **Photographic Chemistry**  
Provides both fundamental and advanced treatment of the photographic process at the molecular level. Light-sensitive emulsion chemistry and formulation, latent image theory and the associated dynamic processes, as well as developer formulation and mechanisms of chemical action, will be treated. Extension and comparisons to solid state and digital imaging processes and materials are investigated. An intensive laboratory component will emphasize application of concepts covered in lectures. (2076-211, 212, 213) **Credit 4**

**2076-303** **Photographic Optics**  
Provides both fundamental and advanced treatment of the optical processes related to image formation. Particular emphasis on photographic lenses and their element design as well as mechanical considerations. Treatment will extend to reflective and fiber optics in the context of imaging and communications applications. An intensive laboratory component will emphasize application of classroom concepts. (2076-211, 212, 213; 1016-204; 1017-211, 212, 271, 272) **Credit 4**

**2076-311** **Color Photo Design**  
Exploration of color images through the application of visual elements principles and attributes, including the key and quality of light in the making of photographs. Color contrast and rendition and comparison of rendition with different photo materials. **Credit 4**

**2076-312** **Color Printing Theory**  
Introduction to color theory and the exploration of color processes utilizing practical laboratory procedures and photographic color reproduction processes. Supports lectures and readings on applied color theory relating to both color photography and its applications. Important topics, in addition to color materials and processes, include color vision, psychological aspects of color, color terminology, and color measurement and specification. **Credit 4**

**2076-313** **Color Measurement**  
Equipment and methods used for the measurement of color are discussed and demonstrated in the laboratory. Topics include light sources, radiometry, spectrophotometry, color order systems, color difference formulas and reproduction of color. **Credit 4**

**2076-401** **Systems Design for Graphic Presentation**  
Study of the hardware and software needed to effectively design computer graphic images. Workstation labs provide hands-on experience with MS-DOS and Mac computer platforms. (2076-203) **Credit 3**

**2076-411** **Imaging Systems**  
This course provides opportunities to study and work with the technologies and issues encountered while running a photographic services lab (such as RIT's Imaging Systems Lab). Using actual equipment, the students will learn about C-41 and E-6 film processes, minilab operations, large format/grand format printing, and higher-end output using machines like the Durst Lambda. Proper use of instruments such as densitometers and spectrophotometers in quality control will be taught. Color management principles will be introduced. Students will also gain experience in the operations issues associated with an imaging services laboratory. (2076-211, 212, 213) **Credit 4**

**2076-412** **Color Management for Photographers**  
This is the second course in a series of three courses to be taken by students registered for a **minor** in imaging systems. This course provides opportunities to study the issues and practice the approaches related to the accurate reproduction of images from "scene" to output using digital cameras, monitors and a variety of output devices. Digital cameras and scanning backs as well as output devices such as large-format printers will be characterized in this course and an optimum workflow will be developed for accurate color reproduction. Students will learn about and use scientific color instrumentation such as spectroradiometers, spectrophotometers and their associated software. A basic knowledge of digital cameras and Adobe Photoshop is assumed in this course. (2076-411) **Credit 4**

**2076-413** **Imaging Workflows**  
This course will provide an opportunity for students to study, investigate and propose solutions to problems encountered in various imaging workflows. Different scenarios and business models (case studies) will be used to illustrate the imaging challenges faced by photographers when outputting their images. By utilizing analytical and problem-solving skills, students will be required to propose optimum solutions to these challenges. (2076-412) **Credit 4**

**2076-454** **Holography I**  
Introduction to holographic and diffractive imaging. Lectures and demonstrations cover the materials, processes and applications of the fundamental types of holograms. Laboratory investigations provide hands-on experience with the construction and playback of transmission, reflection and white-light holograms. (Algebra and physics) **Credit 4**

**2076-461** **Photographic Instrumentation Seminar**  
The student is exposed to a variety of technical, industrial and/or applied photographic experiences in order to gain a fuller understanding of the scope of photography and its applications. Simplified approaches to photographic instrumentation applications are emphasized. Photographic topics that emphasize scientific and technical applications, where photography functions as a tool of measurement and visualization of events beyond the range of normal photographic equipment, are discussed. **Credit 4**

**2076-470** **Summer Nature Photography**  
Students learn the fundamentals of professional nature photography as exhibited by such magazines as *Audubon* and *National Wildlife*. Topics include selection and care of equipment, use of strobes, adapting to adverse weather conditions, sales of photographs, copyright law, freelancing and more. Students are required to spend several hours each week shooting in natural environments. (2076-201, 202, 203 or permission of instructor) **Credit 4**

**2076-471, 473, 473** **Nature Photography**  
Students learn the fundamentals of professional nature photography as exhibited by such magazines as *Audubon* and *National Wildlife*. Topics include selection and care of equipment, use of strobes, adapting to adverse weather conditions, sales of photographs, copyright law, freelancing and more. Students are required to spend several hours each week shooting in natural environments. (2076-201, 202, 203 or permission of instructor) **Credit 4**

**2076-487** **Special Effects Photography**  
A course for practicing photographers and students in which photographic effects beyond those encountered in everyday situations in illustrative, commercial and advertising photography are discussed and practiced. Among the topics covered are stroboscopic, peripheral, scanning, high-speed flash, matte box and combination flash/tungsten photographic techniques. (For upper-division SPAS students) **Credit 4**

**2076-491** **Introduction to Digital Imaging**  
Exploration of the technology, theory and application of digital image processing equipment and procedures, particularly in relation to photographic processes. Principles of input, output and computer processing techniques are covered. Applications such as contrast enhancement, edge sharpening and smoothing are included. (2076-210, 213, and 321 or 0602-208) **Credit 4**

**2076-492** **Electronic Sensitometry**  
This is a course about electronic image quality. The student will work with and characterize the image quality for various electronic I/O devices such as scanners, electronic cameras, printers and other display devices. The electronic imaging system, from light source to output, will be investigated, component-by-component, to discover the effect each component has on total system image quality. Input-output relationships for each component subsystem will be investigated, and the component responses will be collectively used to determine system image quality. (2076-211, 212, 213, 2076-491) **Credit 4**

**2076-499** **Imaging and Photographic Technology Co-op**  
Provides students with on-the-job experience in the field of imaging and photographic technology. The student seeks and acquires a school-approved co-op position in business or industry. The working environment provides the forum for learning more about the student's chosen career. A final interview with the co-op coordinator assists the student in evaluating the experience. **Credit 0**

**2076-501** **Introduction to Research**  
Prepares students for their senior research project. Covers basic research methods, including experimental design, unobtrusive evaluation and selection of an appropriate statistical treatment for the research to be conducted. Chi-square, two-tailed t test, linear regression and nonparametric statistics are taught as pertinent evaluation tools. (Senior status or permission of department chair) **Credit 3**

**2076-503** **Nonconventional Imaging Systems**  
A survey of imaging methods and imaging systems not normally encountered in other technical photography courses, including UV, IR, 3D, holography, electrophotography, x-ray and non-silver applications. (Upper-level photo technology majors or by permission of instructor) **Credit 3**

**2076-511** **High-Speed/time Lapse**  
The theory and practice of photographic systems designed to permit analysis of events of very short or extended duration. Included are operational characteristics of time-lapse cameras, sequencing and timing control devices, time magnification relationships. Also, characteristics of intermittent and rotating prism cameras, rotating mirror and drum cameras, synchronization system and timing controls and high-speed flash and spark gap systems. Students gain experience not only in the use of the basic equipment but also in proper planning, setup and data reduction techniques through a series of practical experiments. (Upper-level photo technology majors or by permission of instructor) **Credit 3**

**2076-550, 551, 552, 553** **Special Topics**  
A seminar approach offered on demand when adequate numbers of students and a faculty member agree to study a subject not normally offered. Available to upper-level students. **Credit variable 1-9**

**2076-572** **Scanning Electron Microscopy**  
A proficiency-oriented course designed to train students to operate and take photographs with a scanning electron microscope (SEM). Emphasis is on understanding and optimization of the instrumental and photographic parameters associated with the SEM. (2076-211, 212, 213 and 2076-303 or 2061-403 or consent of instructor) **Credit 4**

**2076-599** **Independent Study**  
A student-proposed advanced project sponsored by a faculty member. Approval of the proposal by the department chairman and the school director required. Available to upper-level students with a GPA of 3.0 or higher. **Credit variable**

## School of Print Media

### Printing Management

**2080-010** **Co-op Orientation**  
Lectures will provide the fundamentals of job searching strategies using RIT Job Zone and other tools. Students will have the opportunity to register for and use Job Zone to facilitate online job searching. Students will apply the theory of effective interviewing through mock interviews and the theory of effective résumé writing by producing an approved résumé for conventional and electronic dissemination. Guest speakers and SPM senior class student panels will be used to enrich the learning experience. **Credit 0**

**2080-301** **Graphic Media Financial Controls**  
The course covers corporate accounting concepts from the perspective of using the numbers as input to financial analysis and decision making. It considers financial statement components and their derivation from the accounting system and includes financial statement ratio analysis as it relates to print and associated electronic media. **Credit 4**

**2080-319** **Electronic Communications for Publishing**  
In this course students gain extensive knowledge of the various methods and techniques used to electronically distribute information. Topics such as digital signage, closed-circuit television and portable device location/proximity-based solutions will be discussed. Students will also study networking concepts and wireless communications and examine emerging communication technologies. (2082-228 or permission of instructor) **Credit 3**

**2080-371** **Estimating Practice**  
A detailed study of the practice of estimating that provides the student with the understanding that the final price of a printed job is the result of a series of planning decisions made during the estimating process. Development and use of production standards and hourly rates are analyzed to determine their importance in the pricing structure of printed materials. **Credit 4**

**2080-376** **Introduction to Magazine Publishing Management**  
A survey course that gives the student insights into the editorial, production, management, fulfillment and distribution processes vital to the success of any magazine. Leaders from the magazine publishing industry are invited to present three-hour guest lectures on a major aspect of their profession. Graduates of the printing program who have attained prominence within the industry are often guest speakers, encouraging interaction between current and former students. **Credit 3**

**2080-383** **Economics of Production Management**  
This course focuses on the economic/financial concerns of production management in the media environment, particularly in print media and in the electronic technologies that complement print media. Topics include cost identification and analysis, data collection, standards setting, spoilage reduction, scheduling systems and inventory cost control as well as break-even analysis and capital budgeting models. Also considers human factors, such as communication and motivation. **Credit 3**

**2080-499** **Printing Co-op**  
Provides students with on-the-job experience in the graphic communications industry. The student seeks and acquires a school-approved co-op position in business or industry. The working environment provides the forum for learning more about career choices within the industry and gives the student the opportunity to test his or her skills in a competitive environment. A final report on the student's work experiences must be submitted to the co-op coordinator. **Credit 0**

**2080-550, 551, 552, 553** **Special Topics in Printing**  
A management, or management-related, course used to present and investigate on a one-time basis special topics not normally covered in the curriculum. Guest lecturers, such as industry leaders, as well as regular faculty conduct this course. Subject to be covered is announced in advance. **Credit variable 1-4**

**2080-592** **Marketing and Sales**  
This course provides an introduction to the fundamentals of marketing, including formulating a marketing strategy and creating the marketing mix. The promotion part of the marketing mix will be expanded in the second half of the course. Students will create a sales plan and presentation for a firm of their choice. (2082-201 or 2083-201) **Credit 4**

**2080-599** **Independent Study**  
Student selects and develops, with approval from a faculty sponsor, an independent study project of his or her own design. Project and amount of credit assigned must have final approval from the director of the School of Media. (Generally seniors with qualifying GPA) **Credit 1-5**

## Printing Technology

**2081-359** **Bookbinding**  
The introduction of digital printing processes has created the need to bind single or small quantities or printed products. This course is an introduction to the many different binding options, ranging from saddle-stitched pamphlets to hardcover books, as well as the wide range of materials available. Contemporary procedures of finishing on-demand publications are part of this course. Students are encouraged to bring with them some personal projects for binding. There are no prerequisites, but good manual dexterity is desired. **Credit 3**

**2081-364** **Flexographic Process**  
A fundamental course based on the principles and practices of the flexographic printing process. Emphasis is on the elements of flexographic technology from artwork, plates, platemaking, inks and presswork. Lab offers hands-on work centered around platemounting, ink formulation and presswork. (2082-321 and 322 or 2082-371) **Credit 3**

**2081-367** **Lithographic Process I**  
This course provides detailed fundamentals about the equipment and materials that are used in the lithographic process. Topics include press, the image carrier and its chemistry, inks and paper, and process control. This course builds upon the material covered in Materials and Process II. (2082-322 or 2082-371) **Credit 3**

**2081-386** **Gravure Process**  
This course is conducted by means of lectures, class discussions and computer-based simulation to understand the infrastructure and the print production workflows in the gravure printing industry. The learning experiences are enhanced by field trips to engravers, gravure publication printers and gravure packaging printers. (2082-322 or 2082-371) **Credit 3**

**2081-409** **Image Processing Workflow**  
This course concentrates on the image processing variables and techniques required for producing high-quality color reproductions for a variety of output technologies. Emphasis will be on optimizing both image quality and workflow efficiencies from digital capture to final output. Topics include file formats, image processing strategies, color conversion and effective proofing techniques. (2082-208) **Credit 3**

**2081-416** **Quality Control in the Graphic Arts**  
This course offers a practical approach to quality printing with emphasis placed on quality concepts, process capability study, process control and defect prevention. Examines specifications and recommended practices in the printing and publishing industry. Discusses the importance of management commitment and involvement in understanding the need for change and making quality improvement programs work. **Credit 3**

**2081-454** **Print Finishing Management**  
Planning for successful print finishing requires in-depth knowledge of production phases from design through prepress planning, press, bindery and distribution. Emphasizes cost-effective planning and management, based in part on an awareness of the mechanical limitations involved in print production and in a contemporary print finishing environment. (2082-207 and 208) **Credit 3**

**2081-458** **Ink Chemistry and Formulation**  
Course exposes the student to the historical, scientific and technical aspects of ink discovery and formulation. Students will learn how inks were developed dating back to the Middle Eastern/Asian cultures at the dawn of civilization to the present. Students will also synthesize and formulate those inks and test their properties. Analysis methods for modern inks will also be introduced, and students will conduct experiments using those methods. (2082-321, 322 and 1011-211 or equivalent of general chemistry knowledge) **Credit 3**

**2081-467** **Lithographic Process II**  
This is an advanced course in sheetfed and web offset. There is an emphasis on process color printing and on problem solving advanced press and process variables that impact quality and productivity. Lithographic process problem-solving skills are developed using multicolor presses. (2081-367) **Credit 3**

**2081-550, 551, 552, 553** **Special Topics in Printing**  
On a one-time basis presents and investigates technological topics that normally are not covered in the regular curriculum. Guest lecturers such as industry leaders as well as regular faculty conduct this course. Topics to be covered are announced in advance. **Credit variable 1-4**

**2081-562** **Color Perception and Analysis**  
This course addresses principles of human color perception and how color is communicated by samples and measured quantitatively. It explores the role of visual perception in art appreciation and subjective quality assessment. Students will learn how to use digital tools to specify color from design to print for printing and publishing applications. (Basic desktop publishing [Photoshop, QuarkXPress, InDesign, etc. software] competency and technical writing literacy) **Credit 4**

**2081-577** **Print Process Control**  
Test targets are tools used in optimizing and calibrating various components in a color reproduction system. This course will integrate many technical disciplines (e.g., metrology, statistics, process control) to make a color imaging system repeatable and predictable. Emphasis will be on selecting test targets in conjunction with color measurement tools for evaluation of device-level and system-level performance. Two labs and an individual project are required (2082-321, 2082-407 or instructor's approval). **Credit 4**

## Graphic Media

**2082-201** **Graphic Media Perspectives**  
This course introduces students to the graphic media industries by studying its history, culture, technology, markets and workers. It establishes a basic understanding of the current technologies by examining the industry and businesses that employ them. Students will gain comprehension of the businesses and roles that exist in the various industries and an overview of industry structures and the effect of new media. **Credit 2**

**2082-207** **Graphic Media Workflow I**  
This introductory course provides students with fundamental understanding of the key variables, systems and phases of production workflow. Emphasis will be on job planning, implementation strategies and decision-making processes for print and e-media production workflow. Projects will allow students to optimize their work for specific production requirements and to optimize content and workflow strategies for cross-media applications. **Credit 4**

- 2082-208** **Graphic Media Workflow II**  
This course will allow students to develop a more cohesive understanding of digital workflow and the underlying responsibilities and decisions in preparing content for production. It will present real-world applications of digital workflows and include preflighting, font management, file compression, raster and vector file requirements, PDF workflow, networking and telecommunications, and advanced trends. It will provide students with the opportunity to develop critical thinking and problem-solving skills when dealing with workflows that link design/creative and production/publishing components of a workflow in a cross-media environment. (2082-207) **Credit 4**
- 2082-218** **Leadership and Interpersonal Communication**  
This course introduces the students to the skills and traits needed for successful leadership and managerial roles in the graphic media publishing industry. Dynamic change, driven by emerging new media and rapid technological displacement of old technology, coupled with evolving digital workflows, requires future leaders to develop relations and critical thinking skills in order to cope with these challenges. The fundamental skills of mutual trust, developing vision and communicating effectively will be emphasized during this course. **Credit 4**
- 2082-228** **Multimedia Publishing**  
An introductory course in interactive publishing. Students will explore methods and approaches to interactive multimedia design and production for a variety of applications and will develop interactive presentations for mobile, stand-alone, and Web-based environments. (2009-411) **Credit 3**
- 2082-303** **Professional and Technical Writing**  
This course prepares students to engage in a variety of written and oral communications necessary in academic and business environments. Students are expected to produce appropriate audience-centered written materials that achieve a desired purpose based on techniques, organization, format and style. A formal technical report and presentation are required. Students must pass this course with a grade of B or higher prior to graduation or pass the Writing Competency Test given each quarter. (0502 227; corequisite 0504-319) **Credit 4**
- 2082-311** **Packaging Solutions**  
This course introduces students to the package printing industry. Topics covered will include flexography, gravure, digital printing, platemaking, packaging substrates, color workflows, specialty coatings and production planning. Students will initiate projects that take a package from creation to final production. (Junior status) **Credit 4**
- 2082-313** **Media Distribution and Transmission**  
In this course students gain extensive knowledge of the various methods and techniques used to electronically and physically distribute information. Students will also study planning, scheduling, inventory management and customer fulfillment. **Credit 4**
- 2082-317** **Website Design for Graphic Media Publishing**  
This course enhances skills related to HTML, Web publishing and multimedia provided in previous course work. Students will prepare and implement complex Web projects that take into account usability, accessibility, information layout and graphics use in the context of the Web. They will examine and implement publishing projects that repurpose print-based materials as they develop a sensitivity to cross-media issues. (Sophomore status) **Credit 4**
- 2082-321** **Materials and Processes I**  
This course offers a survey of the materials and processes used in print reproduction. Students will learn the basic theory of image reproduction embodied in the available analog and digital printing processes and learn to identify the process origins of print samples. Students also will learn the chemical and physical properties associated with the consumables in order to obtain the understanding necessary to make informed decisions about use and application. **Credit 3**
- 2082-322** **Materials and Process II**  
This course presents a multidimensional model for comparison of all major print reproduction processes. Students will develop a sophisticated understanding of the capabilities and suitable applications of each process. A press run for some of the processes will be carried out. The same test targets and images will be used for each press run. The students will see how to prepare files for the different presses. An introduction to image quality will show the students how substrates, inks, toners and presses/printers all interact and how the final prints can be evaluated. (2082-321) **Credit 3**
- 2082-337** **Digital Asset Management**  
This course is designed to expose students to all the elements encompassing digital asset management (DAM). It will explore ways a variety of companies create and utilize a DAM system, which allows for efficient and easy storage, browsing and quick location of files. Students will learn to identify and access files that extend to four areas within a company: finding images and data, systematizing the workflow, collaborating and managing rights. DAM systems consist of software for sorting, searching and retrieving and hardware for storing, accessing and distributing. **Credit 3**
- 2082-367** **Media Industry Analysis**  
This course provides students with an understanding of the major industries closely allied with the printing industry: advertising, publishing and packaging. The intent is to give students in-depth knowledge of the structure of each of these industries; the channels and methods through which and by which each distributes its products and services; and the major customers/clients of its products and services. Particular attention will be devoted to investigating the business models for using print to create value in advertising, publishing and packaging. (2082-201 or 2083-201) **Credit 4**
- 2082-371** **Principles of Printing**  
This course offers a survey of the materials and processes used in print reproduction. Students will learn the basic theory of image reproduction embodied in the available analog and digital printing processes and learn to identify the process origins of print samples. In addition, students will learn the chemical and physical properties associated with the consumables in order to obtain the understanding necessary to make informed decisions about use and application. **Credit 4**
- 2082-378** **Finishing and Digital Imposition**  
Finishing is a critically important but often overlooked step in the successful production of a printed piece. Imposition of the customer's design onto the press sheet allows the piece to be properly finished. This course will focus on the imposition and finishing techniques that enable the modern print production facility to efficiently manufacture completed pieces. (2082-207, 208) **Credit 3**
- 2082-387** **Substrates for Printing**  
This course covers the science and technology of the many kinds of printing substrates used by various printing processes. Students will learn the basic concepts of the substrate composition, structure, manufacture, optical and appearance properties. They will also learn about testing printing substrates, with an emphasis on factors that relate to print quality and press runnability. (2082-321, 322 and 1011-211 or equivalent) **Credit 3**
- 2082-401** **Digital Print Process**  
This course provides students with an opportunity to learn the principles and applications of digital printing. It presents the technical aspects of the major digital print engines and compares digital printing to conventional printing processes. The strategic use of digital printing is emphasized from a digital workflow standpoint. Variable data personalization and on-demand printing are studied from both technical and marketing perspectives. **Credit 3**
- 2082-407** **Color Management Systems**  
This course addresses the science and technology of color management systems in achieving quality color reproduction and scanner-monitor and proof-print agreement. Students will study the role of color measurement for device calibration and characterization and building an ICC-based color management system. Students will also perform color image rendering from digital capture to print, investigate digital proofing, soft and remote proofing, and evaluate color management system performance. Process control tools and analysis of control targets will also be covered. (2082-207 or permission of instructor) **Credit 4**
- 2082-413** **Operations Management for Graphic Media**  
A study of the topics/factors affecting the efficiencies and effectiveness of graphic media operations. Includes consideration of both external (i.e., OSHA, environmental, legal) factors and internal factors (i.e., scheduling, plant layout, training) that directly affect operations. Addresses the importance of a quality program as well as emerging workflow systems. (2080-383) **Credit 4**

**2082-417 Database Publishing**  
This course introduces the fundamental elements of databases constructed for publishing and advertising. Topics include the process of building databases comprised of information and digital assets; building databases that support publishing business activities such as circulation, and building databases that produce targeted products such as direct mail advertising using variable data printing technology for producing personalized documents. (Basic computer skills and competency in using a page-layout application such as InDesign or QuarkXPress) **Credit 4**

**2082-421 Image Processing and Analysis**  
This course will provide the foundation required to understand the basic concepts of imaging and its relation to human visual perception. The course presents a formalized view of the underlying imaging science concepts used throughout the workflow of a graphic arts document from input to output. Topics will include various types of filters, mathematical image operations, compression and screening. (2082-207 and 208) **Credit 3**

**2082-428 Advanced Multimedia Publishing**  
This course will advance and refine techniques used in multimedia publishing and will provide students with the opportunity to further their knowledge in interactive, dynamically published documents. Advanced concepts explored will include multimedia scripting, interactive publishing workflows and interactive navigation for publishing. Advanced features of multimedia publishing software tools will be featured. (2082-228) **Credit 3**

**2082-502 Capstone Seminar**  
This course is designed to provide students with an interactive forum to discuss critical issues impacting the graphic media industries. Through applied research and active discussion, students will gain insight into the current state of and emerging trends in the graphic media industries. (JPRV fourth-year status) **Credit 2**

## New Media Publishing

**2083-201 New Media Perspectives**  
This course introduces students to the graphic and new media industries by studying its history, culture, technology, markets and workers. It establishes a basic understanding of the current technologies by examining the industry and businesses that employ them. Students will gain comprehension of the businesses and roles that exist in the various industries as well as an overview of industry structures and the effect of new media. **Credit 3**

**2083-206 Imaging for New Media**  
Imaging for New Media addresses the skills and competencies necessary to create and manipulate digital images. This course introduces students to the creation, acquisition, filing, storage and production, manipulation and output of raster images. (2083-216) **Credit 4**

**2083-211 Cross-Media Publishing**  
This course provides students with a basic understanding of the technology that underpins publishing, production and distribution. Critical phases of production workflow will be examined with an emphasis on effective job planning, technical considerations and the decision-making processes that enable successful implementation of print, digital and cross-media output and distribution strategies. Projects will allow students to produce material for specific production requirements. (2009-311, 2083-206) **Credit 3**

**2083-216 Digital Foundations**  
This course provides an orientation to the production concepts, working environments, hardware and software tools, languages, standards, and culture that the students will use as a foundation for the core courses in New Media Publishing. **Credit 4**

**2083-217 Typography and Page Design**  
The course provides an introduction to the theoretical and practical foundations of typography and page design. Students will study the history, aesthetics, and technology of typography. Projects will include design and production methods, using current software tools and fonts for typography in print, and screen display. Students will apply their acquired knowledge to make informed decisions in the practice of typography. (2083-216) **Credit 4**

**2083-316 Webpage Production**  
This course will apply text, image, and page design skills to web publishing. Students will prepare and implement publishing projects that take into account usability, accessibility, information layout, and graphics use in the context of the Web. (2083-206 and 2083-217) **Credit 4**

**2083-317 News Production Management**  
New media publishing technologies production is examined from a holistic viewpoint. This is a course that brings together all the elements of new media publishing technologies such as various computer platforms, digital photography and other multi-media content (rich media content), and distribution mechanisms. This is the micro companion to the macro digital news systems management. This course focuses on the management of these elements rather than on specific technologies. The lecture portion focuses on the specific application of managerial principles to new media production while the lab portion is based on group production exercises. **Credit 3**

**2083-323 Multimedia Strategies**  
This course is designed to explore all of the available mass media and customized communications technology options for effectively reaching consumers. It will explore advertising, personalized direct mail, the Internet, call centers and direct client interface via Internet chat sessions. The emphasis will be on development of the right mix of marketing communications techniques to drive both new business and customer retention. (Sophomore status) **Credit 4**

**2083-328 Information Architecture for Publishing Systems**  
In this course students will research current and emerging publishing information technology trends and apply them to create publishing solutions across a variety of platforms. Projects will emphasize aggregation and reuse of content across multiple distribution channels. (4002-230 and 0112-340) **Credit 4**

**2083-346 Print Production Workflow**  
Students will learn industry best practices for print publishing applications. Students will prepare content to be printed across a variety of printing platforms. (2083-206, 2083-217) **Credit 4**

**2083-368 Advanced Imaging: Retouching and Restoration**  
This course demystifies the process of digitally enhancing, retouching and restoring images in the industry standard raster software. This class is designed for imagemakers who have a solid working knowledge of the current industry standard raster software and are interested in advancing their skills in digital image enhancement, retouching and restoration. This course also includes image acquisition. (2083-206 or equivalent proficiency in Photoshop or permission of instructor) **Credit 3**

**2083-402 Media Law**  
This course offers an opportunity to investigate the philosophical and constitutional foundations of free expression as it relates to speech, writing, image making and publishing. First Amendment principles will be studied with respect to personal protection boundaries. The course will also provide a survey covering defamation issues. Students will form educated opinions about libel and slander boundaries. Since the publication discipline involves the creation of original work, a study of copyright, patent and trademark law will be provided. **Credit 3**

**2083-412 Digital News System Management**  
This course surveys the breadth and links of both conventional and digital news outlets but concentrates on magazine, newspaper and online news services. The lectures focus on the various models, values, skills and general management systems used in the industry, imparting the fundamental planning knowledge required of all managers in the news business. This course prepares the student for a more advanced co-op experience in a complex digital news organization. **Credit 4**

**2083-416 Media Business Basics**  
This course introduces business principles, such as accounting, finance, and marketing, that are essential to developing or growing a media venture. Students will develop a business plan and identify potential financial supporters. **Credit 4**

**2083-542 New Media Team Project I**  
The first course in a two-quarter sequence designed to engage the new media major in a capstone production experience. The instructor will form student teams that will design and complete a multimedia campaign for organizations selected by the instructors. **Credit 4**

**2083-543 New Media Team Project II**  
The second course in a two-quarter sequence designed to engage the new media major in a capstone production experience. Students continue work to completion of their new media group production project. Each group is required to test its product with a focus group and provide written feedback and analysis. (2083-542) **Credit 4**



# College of Liberal Arts

## Index

0501	Criminal Justice.....	89
0502	Language.....	91
0504	Literature.....	93
0505	Fine Arts.....	96
0507	History.....	100
0508	Science, Technology and Society.....	103
0509	Philosophy.....	105
0510	Anthropology.....	108
0511	Economics.....	110
0513	Political Science.....	112
0514	Psychology.....	116
0515	Sociology.....	118
0519	Interdisciplinary—Aerospace.....	120
0520	Interdisciplinary—Liberal Arts.....	120
0521	Public Policy.....	120
0522	Women’s and Gender Studies.....	121
0524	International Studies.....	123
0525	Foreign Language.....	123
0526	Urban and Community Studies.....	130
0531	Material Cultural Science.....	130
0535	Communication.....	131
0550	Honors Courses.....	134

Course numbering: RIT courses are generally referred to by their seven-digit registration number. The first two digits refer to the college offering the course. The third and fourth digits identify the discipline within the college. The final three digits are unique to each course and identify whether the course is noncredit (less than 099), lower division (100–399), upper division (400–699), or graduate level (700 and above).

Unless otherwise noted, the following courses are offered annually. Specific times and dates can be found in each quarter’s schedule of courses, published by the Office of the Registrar. Prerequisites/corequisites are noted in parentheses near the end of the course description.

## Criminal Justice

**0501-201 Seminar in Criminal Justice**  
Covers the principles of the criminal justice system, including the relationship between system components, their effectiveness, and theories of operation and reform. Consideration is also given to specific problems within the branches of the criminal justice system. This seminar course involves extensive reading, writing and discussion. It acquaints students with key resources for criminal justice research. Required course for criminal justice majors. **Class 4, Credit 4 (offered regularly)**

**0501-307 Investigative Techniques**  
To familiarize the student with the different types and forms of physical evidence that a technician is likely to encounter in the investigation of the crime scene and related innovations to the criminal justice system. Students will learn the primary methods used in crime scene, evaluation, search, recording and collection of physical evidence, basic techniques of crime management, photography, drawing and reporting. Fingerprint and firearms identification as well as serology and trace evidence will be studied. Required course for criminal justice majors. **Class 4, Credit 4 (offered annually)**

**0501-400 Criminology**  
A survey of the field of criminology with emphasis on major forms of contemporary crime, definition of crimes and criminality, theories of criminality, the extent of crime, criminal typologies and fundamental aspects of the social control of crime. Required course for criminal justice majors. Part of the criminal justice concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered regularly)**

**0501-401 Research Methods I**  
This is the first of two courses designed to provide students with a foundation in social science research methods. Through lecture, discussion and activities associated with a research proposal, the different methods of conducting research are presented. Stress is on issues of deducting hypotheses from theoretical frame works, variable construction, experimental design, sampling methodology and the techniques and methods of data collection. Students will formulate a written research proposal that details a research question and the research design appropriate for addressing that question. Required course for criminal justice majors. (Junior status, two math and computer course requirements) **Class 4, Credit 4 (offered annually)**

**0501-403 Field Experience**  
Internship practicum for all pre-service criminal justice students. Gives the student firsthand experience in the field of criminal justice in an appropriate organization that meets the needs of the student’s career objectives. Students are closely supervised at selected organizations, developing their pre-professional skills while learning the organization’s programs and methods. The student also is required to attend a seminar that runs concurrently with field work. Required course for criminal justice majors. (Senior status) **Class variable, Credit 8 (offered twice annually)**

**0501-405 Major Issues in the Criminal Justice System**  
Focuses on contemporary issues and topics not otherwise distinctly incorporated in established criminal justice courses. Concentrates on student discussion and interaction surrounding required readings on topics such as deviance, crime prevention, issues in the prosecution/court system, deterrence, female criminality and computer applications. Recent examples include art, theft and fraud; crime and justice in the community; international crime; legal controversies in the law, seminar in sexual violence; stress in the CJ system; substance abuse; terrorism and hostage taking; legal research. Professional elective course for criminal justice majors. Part of the criminal justice concentration and minor; may also be taken as an elective. Part of the legal studies minor (specific topics). (Junior or senior status) **Class 4, Credit 4 (offered regularly)**

**0501-406 Technology in Criminal Justice**  
Develops understanding of theories, management processes, organizational capabilities and social implications of criminal justice technologies. Many categories of technology are considered, including tools and techniques used for communications and records management; transportation and traffic management; apprehension and detention of suspected offenders and criminals; crime scene investigations and laboratory forensics; telephonic and physical surveillance; and weapons, special assault and protection tactics. Students consider the role of industry, government and user groups in the historical development and legal/ethical use of specific technologies, including less than lethal. Special attention is given to information technology. Part of the criminal justice concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered regularly)**

**0501-409 Legal Rights of the Offender**  
Presents an in-depth study of substantive and procedural law as it affects convicted offenders. Considerable attention is devoted to the study of constitutional rights and privileges, how they apply to convicted offenders and the methods employed to secure these rights. Conviction and its consequences are explored, as is the sentencing process. The rights of prisoners, probationers and parolees are reviewed. In addition, the various remedies for enforcement of these rights are discussed, including direct appeals, collateral attacks and a variety of postconviction remedies. Intended for students who wish to pursue a career in law enforcement, corrections, probation, parole or law. However, students interested in some other aspect of criminal justice that deals with convicted offenders may find this course useful. Professional elective for criminal justice majors. Part of the legal studies minor. (Junior or senior status) **Class 4, Credit 4 (offered occasionally)**

**0501-410 Management in Criminal Justice**  
Presents the history and development of the principles of management and organizational theory as they have been applied to the field of criminal justice. This developmental evaluation is followed by a presentation of principles and philosophies of agency administration that have been effective in business, industry and government, with the intention of discussing their applicability throughout the criminal justice system. Required course for criminal justice majors. (Junior or senior status) **Class 4, Credit 4 (offered annually)**

- 0501-411 Seminar in Corrections**  
Sequel to Corrections. Presents a critical evaluation of the contemporary correctional programs in the United States. Programs discussed include jails, prisons, probation, parole, halfway houses, study release, work release, prison furloughs and various community-based correctional techniques. Emphasis is on the theories of penology and rehabilitation that provide direction to the correction system today and on the theoretical positions that may affect the future of corrections. Required course for criminal justice majors. (0501-201, 207) **Class 4, Credit 4 (offered occasionally)**
- 0501-415 Domestic Violence**  
For social work students, criminal justice students and professionals who are interested in examining the problems related to domestic conflict and violence. Included is a study of the dynamics of violence as reflected in child abuse, incest, marital rape, spouse and parental abuse, and violence among siblings. Professional elective for criminal justice majors. (0501-400) **Class 4, Credit 4 (offered occasionally)**
- 0501-440 Juvenile Justice**  
This course examines the concepts, theories and environmental influences of juvenile offenders, the impact of the judicial system, and control and corrections on juvenile justice. The course also examines the role of forces in the system, including police, courts, community resources and treatment. Required course for criminal justice majors. Part of the criminal justice concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered regularly)**
- 0501-441 Corrections**  
Introduction to the basic organizations of the correctional system, their functions and performance. Prisons and jails, as well as probation and parole agencies, are discussed in the context of historical and contemporary philosophy. Attention also is focused on decision-making functions, the role of various personnel within the correctional system and the population of offenders within it. Strategies for rehabilitation and their effectiveness are surveyed. Required course for criminal justice majors. Part of the criminal justice concentration and minor; may also be taken as an elective. (0501-400) **Class 4, Credit 4 (offered annually)**
- 0501-443 Law Enforcement in Society**  
The social and historical origins of the various police systems; police culture, role and career; police in the legal system; social and legal restraints on police practices; police discretion in practice; police and community; police organization and community control mechanisms. Required course for criminal justice majors. Part of the criminal justice concentration and minor; may also be taken as an elective. (0501-400) **Class 4, Credit 4 (offered regularly)**
- 0501-444 Concepts in Criminal Law**  
The course deals with the substantive and procedural criminal law. Emphasis will be on various concepts of criminal law and practice: how ideas, laws and community perception influence the criminal justice system. Characteristics of crimes against people and property will be examined, including the nature of criminal conduct, intent and causation. Required course for criminal justice majors. Part of the criminal justice concentration and minor; may also be taken as an elective. Part of the legal studies minor. (0501-400) **Class 4, Credit 4 (offered annually)**
- 0501-445 Minority Groups and the Criminal Justice System**  
The goal of this course is to enlighten as well as sensitize the student and future professional on issues of minorities and criminal justice system. This course will investigate the role played by racial minorities—African Americans, Native Americans, Hispanic Americans and Asian Americans—at each level of the criminal justice system in the United States. The experience of African Americans will be emphasized since this group has been the subject of more extensive research by criminologists and criminal justice practitioners. Professional elective course for criminal justice majors. Part of the criminal justice concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**
- 0501-446 Women and Crime**  
Deals with women as criminal offenders and as victims of crime, focusing on theories about women in crime, types of crimes committed, patterns of criminality and the treatment of women offenders. Also examines the role of women as law enforcement officers, judges, lawyers and correctional officers in the criminal justice system. Professional elective for criminal justice majors. Part of the criminal justice concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0501-456 Courts**  
This course provides students with an understanding of the recognized functions of courts in the American criminal justice system. Jurisdiction, policies and procedures of courts in the administration of criminal justice, including trial and appellate courts, will be discussed. Courts will be examined at the local, state and federal levels. Required course for criminal justice majors. Part of the criminal justice concentration and minor; may also be taken as an elective. Part of the legal studies minor. (0501-400) **Class 4, Credit 4 (offered annually)**
- 0501-460 Current Issues in Criminal Justice**  
This course involves year-long participation in, and written critique of, a designated set of lectures, roundtables and presentations on topics covering current issues in criminal justice. The goal is to engage students in discussion of current issues with their peers and with experts in the field. Students must sign up in the criminal justice office for fall and register for the course in the spring quarter; may be taken up to four times. Professional elective for criminal justice majors. (0501-400) **Class 2, Credit 2 (offered occasionally)**
- 0501-505 Corporate and White Collar Crime**  
An examination of the extent and character of white collar crime with special emphasis on business and professional deviance. Professional elective for criminal justice majors. (0501-400) **Class 4, Credit 4 (offered occasionally)**
- 0501-506 Evidence**  
Provides the student with an awareness of what types of evidence are admissible in a criminal trial. Includes a comprehensive analysis of the most frequently used rules of evidence. There are readings and discussions pertaining to the nature of real, testimonial, hearsay and circumstantial evidence. Examines rules concerning the cross examination of witnesses, exceptions to the exclusion of hearsay evidence, the burden of proof, the provinces of the judge and of the jury, legal presumptions and the exclusion of illegally obtained evidence. Professional elective for criminal justice majors. Part of the legal studies minor. (0501-400) **Class 4, Credit 4 (offered occasionally)**
- 0501-507 Computer Crime**  
This is a non-technical course that provides definitional, theoretical and operational context for understanding computer-based competition conflict and crime in the information age. Students study the history, nature and extent of computer-related crime as well as differing types of computer criminals, their motivations and the methods they use to threaten, attack, compromise or damage physical and cyber assets. The course considers legal and regulatory environments and the impact these have on policies and practices related to ethics in the management of information security, data encryption, privacy and numerous other special topics. Part of the criminal justice concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered regularly)**
- 0501-510 Interview and Counseling in Criminal Justice**  
Instructs the student in the various accepted contemporary dynamics of interviewing and counseling criminal justice and related human service clients. Issues discussed revolve around counseling and supervision strategies and conflicts among agencies, between administrators and staff, and clients. Presents both the practical and theoretical aspects of these issues and devotes attention to surveying prospective counseling strategies for accomplishing desired behavioral change. Required course for criminal justice majors. (Junior or senior status) **Class 4, Credit 4 (offered annually)**
- 0501-511 Alternatives to Incarceration**  
Analyzes possible sentencing options available to the criminal courts as well as pre-adjudicatory alternatives for both adult and juvenile offenders. The variety of dispositions evaluated include probation, parole, halfway houses, work-release, study-release, prison furloughs, pretrial release, pre-probation alternatives (fines, suspended sentences, conditional discharge and a variety of diversion programs). Special emphasis is on a critical evaluation of the alternatives as they compare to the more traditional methods of handling offenders. Field trips and guest lecturers from nontraditional programs are typically included in the course. Professional elective for criminal justice majors. (0501-400) **Class 4, Credit 4 (offered occasionally)**
- 0501-517 Comparative Criminal Justice System**  
Examines, in a comparative analysis, the criminal system and the penal methods of Europe and the United States. Major emphasis is given to the issues of intent; criminal responsibility; individual and public interests; purposes and modes of prevention, repression and punishment; and methods of trial, punishment and pardon. Professional elective course for criminal justice majors. (0501-400) **Class 4, Credit 4 (offered occasionally)**

**0501-518** **Criminal Justice and the Community**  
Examines the goals and objectives of agencies operating within, or directly related to, the criminal justice system in relation to mutual expectations, the community and the agency in the delivery of services. Emphasis is on inter-group responsibilities in exploring strategies to reduce conflict in solving public problems within the sphere of the criminal justice system. Professional elective for criminal justice majors. (0501-400) **Class 4, Credit 4 (offered occasionally)**

**0501-522** **Victimless Crime**  
Familiarizes the student with many of the implications and ramifications of efforts to control "victimless" crimes. Discussions concentrate on the illegal activity associated with prostitution, gambling, homosexuality, drug use and pornography. The social, moral, legal and practical consequences of legalizing such activities are examined and evaluated. Professional elective for criminal justice majors. (0501-400) **Class 4, Credit 4 (offered occasionally)**

**0501-523** **Crime and Violence**  
Focuses on the outbreak and increase of violent crime and criminal trends in the United States as one of the more serious realities in this century. In addition to a historical review, contemporary problems such as violence in the streets, terrorism, riots and vigilantism are explored as well as the role of various criminal justice agencies in attempting to control these problems. Professional elective for criminal justice majors. (0501-400) **Class 4, Credit 4 (offered occasionally)**

**0501-526** **Seminar in Criminal Justice and Public Policy**  
A critical analysis of some of the current issues, problems and concerns in the area of law enforcement; emphasis on basic police functions in regard to the courts, corrections and the community. Conflicts between theory and practice are examined and analyzed, and future trends in law enforcement are explored. Required course for criminal justice majors. (0501-443, junior status) **Class 4, Credit 4 (offered occasionally)**

**0501-528** **Theories of Crime and Criminality**  
A comprehensive survey of historical and contemporary theories of the causes of crime. Included are theories that derive from biological, psychological, sociological, geographic, economic and political perspectives. Development of criminological theory reviewed; fundamental distinctions between classical and positive theories and between theories of crime and criminality discussed. Required course for criminal justice majors. (0501-201) **Class 4, Credit 4 (offered occasionally)**

**0501-529** **Public and Private Safety**  
Examines, through survey techniques, the complex problems confronting business and industry in the protection of assets. The use of electronic and nonelectronic anti-intrusion systems and other hardware is examined and evaluated. Safety and accident prevention, health hazard prevention methods, and fire prevention and control also are examined. Professional elective for criminal justice majors. (0501-400) **Class 4, Credit 4 (offered occasionally)**

**0501-536** **Seminar in Security**  
For seniors completing criminal justice degree requirements with a concentration in security. Focuses on critical issues, problems and concerns in the area of security that are not otherwise covered directly or in depth in established security courses. Topics are expected to vary from offering to offering. Professional elective for criminal justice majors. (0501-400) **Class 4, Credit 4 (offered occasionally)**

**0501-541** **Research Methods II**  
This is the second of two courses designed to provide students with a foundation in social science research methods. Through lecture, discussion and activities associated with a research project, emphasis is on the creation of null hypotheses, identification of the relationships among variables, establishment models, and analysis of data using both parametric and non-parametric statistics. The required research projects typically include data gathering and coding procedures, entry of the data to a file, the use of application software (e.g., SPSS, MINITAB, SAS) and preparation of a final report. Required course for criminal justice majors. (0501 400) **Class 4, Credit 4 (offered annually)**

**0501-542** **Honors Research**  
For students interested in research applications beyond basic scientific analysis and design. Included in the course are advanced statistical techniques of criminal justice data and qualitative field methods. Three projects are required. First, an analysis of a multigroup design experiment must be performed using an available criminal justice database. Second, an ongoing qualitative field study must be completed utilizing classical observation methodology. Third, the student must complete a draft of a formal research proposal for a sponsoring agency. A group field visit to the research foundation is included in this assignment. The course is in seminar format and includes case discussion and method critiques. Only students who have taken scientific methodology and research methods should apply to this course. Professional elective for criminal justice majors. **Class 4, Credit 4 (offered annually)**

## Language

**0502-100** **Basic Writing**  
This course develops minimal entry-level college writing competencies as a prerequisite to Writing and Literature I or the new writing course. The credits earned do not comprise part of the student's normal liberal arts general education curriculum nor may the course be substituted for Writing and Literature or Writing Seminar. **Class 4, Credit 4 (offered quarterly)**

**0502-110** **Written Communication I**  
This first course in a two-quarter basic writing course sequence for NTID-supported students develops the writing skills necessary to complete 0502-227 Writing successfully. It serves students who need additional time to meet RIT's freshman writing competency requirements as well as students who need to develop skills prerequisite to Writing Seminar. It focuses on the conventions of expository essay writing and critical reading. Registration by permission of the department of liberal arts NTID support. A grade of C or better in this course is required for students to register for Written Communication II. **Class 4, Credit 4 (offered regularly)**

**0502-111** **Written Communication II**  
This second course in a two-quarter basic writing course sequence for NTID-supported students develops the writing skills necessary to complete 0502-227 Writing successfully. It serves students who need additional time to meet RIT's freshman writing competency requirements as well as students who need to develop skills prerequisite to Writing Seminar. It focuses on research paper writing using primary and secondary source materials, introduces the conventions of persuasive writing and reinforces the conventions of expository essay writing presented in Written Communication I. Registration by permission of the department of liberal arts NTID support. **Class 4, Credit 4 (offered regularly)**

**0502-227** **Writing Seminar**  
This is a one-quarter, four-credit seminar limited to 19 students per section designed to develop first-year students' proficiency in analytical writing, critical reading and critical thinking. Students will read, understand and interpret a variety of texts representing different cultural perspectives and/or academic disciplines. Texts, chosen around a particular theme, are designed to challenge students intellectually and to stimulate writing for a variety of contexts and purposes. Attention will be paid to the writing process, including an emphasis on teacher-student conferencing, self-assessment, class discussion, peer review, formal and informal writing, research and revision. ( Liberal Arts Qualifying Exam for students who scored below 560 on verbal portion of SAT or below 6 on essay portion of SAT and below 23 on the ACT) **Class 4, Credit 4 (offered quarterly)**

**0502-325** **Honors Writing Seminar**  
This is a one-quarter, four-credit seminar limited to 16 students per section designed to develop first-year students' proficiency in analytical writing, critical reading and critical thinking. Students will read, understand and interpret a variety of texts representing different cultural perspectives and/or academic disciplines. Texts, chosen around a particular theme, are designed to challenge students intellectually and to stimulate writing for a variety of contexts and purposes. Through this course, students will gain experience analyzing topics critically and developing writing strategies that will be strengthened throughout their academic careers. There will be particular attention to the writing process, including an emphasis on teacher-student conferencing, self-assessment, class discussion, peer review, formal and informal writing, research and revision. **Class 4, Credit 4 (offered regularly)**

**0502-443** **Written Argument**  
All fields and professions require us to present arguments to support a point of view. So every student needs to know how to make claims, provide evidence, explore underlying assumptions and analyze counter points. In this course, students will learn about the elements of reasoning. Students will identify the argument in a piece of writing, assess whether an argument is successful and recognize particular means of argumentation. Students will also study the difference between argumentation and persuasion. Throughout the course students will practice both argument and persuasion in various texts that may be taken from academic, political and scientific fields. Part of the writing studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered quarterly)**

**0502-444** **Technical Writing**  
Provides knowledge of and practice in technical writing style; audience analysis; organizing, preparing and revising short and long technical documents; designing documents using effective design features and principles and format elements; using tables and graphs; conducting research; writing technical definitions, instructions, and physical and process descriptions; and individual and group editing. Required course for communication majors and a professional elective for advertising and public relations majors. Part of the writing studies concentration and minor and the communication minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered quarterly)**

**0502-445** **The Evolving English Language**  
What makes the English language so difficult? Where do our words come from? Why does Old English look like a foreign language? This course surveys the development of the English language from its beginning to the present to answer such questions as these. Designed for anyone who is curious about the English language or the nature of language change. May be taken as a professional elective for communication majors. Part of the writing studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0502-449** **Worlds of Writing**  
This course offers a diverse range of written assignments, including personal narrative, research and analysis, oral histories, documentary studies, and literary interpretation. Accompanying the written assignments are selected readings on the life adventures of a famous physicist, investigations into significant historical events, documentary narrative, oral history and photography on the world of work, holocaust survivor memoirs in comic book form, selected short stories and poems as well as videos and other media. The course focuses on the social context of language, on issues of representation, and how language shapes our understanding of reality. Part of the writing studies concentration and minor and science writing minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0502-451** **Creative Writing: Poetry**  
An exploration of the techniques of writing poetry in both open and closed forms. Professional elective for technical communication major. Part of the creative writing minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered quarterly)**

**0502-452** **Creative Writing: Prose Fiction**  
An exploration of some of the most important contemporary techniques of prose fiction in the short story form. May be taken as a professional elective for communication majors; part of the creative writing minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered quarterly)**

**0502-453** **Advanced Creative Writing**  
Students who have completed Creative Writing or who have satisfied the instructor (normally by presentation of a writing sample) of their readiness to undertake the course are given an opportunity to explore in depth a literary genre, subject or theme chosen by the individual student in conference with the instructor. The acceptability of the student's project is determined on the basis of its intrinsic literary merit and its potential value to the student's development as a writer. May be taken as a professional elective for communication majors; part of the creative writing minor; may also be taken as an elective (0502-227 or equivalent, 0502-451 or 452 or equivalent) **Class 4, Credit 4 (offered quarterly)**

**0502-455** **Writing the Self and Others**  
"To know oneself better through others and to know others better through oneself" is one writer's view of the ultimate aim of education and is an appropriate description of the intent of this course on focused autobiographical writings and modest oral history projects. This course emphasizes the reflective process of memoir writing, moving from short exercises into longer, peer-reviewed papers, as well as the constructive aspect of oral history through listening, transcribing and editing. Students read from culturally diverse memoirs and oral histories, study theoretical concepts of narrative and oral history, view photographs and films. Our purpose is to expand, through writing, an awareness of the complexities of such old human practices as telling and listening to stories about our lives. Part of the writing studies concentration and minor; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0502-456** **Rhetoric of Science**  
Galileo was not only one of the world's most important scientists but also one of the world's most talented writers. Darwin was master of metaphor. Barbara McClintock has made corn the most interesting vegetable in genetics research. In this course, students will read the writing of the most influential scientists-rhetoricians who have had to persuade both professional and public audiences of the validity of their science. We will trace the history of the "scientific paper" from the Royal Society to contemporary journals and look at students' favorite figures and texts in the history of science, ongoing controversies in contemporary scientific debates, and the representation of science in popular culture. Part of the writing studies concentration and minor, required course for science writing minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0502-457** **Language, Dialects and Identity**  
Have you ever been made fun of for the way you talk? Or judged someone else based on their accent or use of slang? In this sociolinguistics course, we will learn the science and history behind why people who supposedly speak the same language do so in such a different way and how the way we talk marks our identity in society. How did British and American English get to be so different? Are New Yorkers really street smart and Southerners really laid back, or is that just a stereotype associated with their dialects? Why does language change to begin with? In addition to regional dialects, we will look at how language use varies based on social factors such as race, ethnicity, gender and social class. We will also consider sign language, language in politics, language in advertising, bilingualism, Spanish in the U.S., and such heated topics in our culture as Ebonics (African American English) and the movement to make English the official language of the U.S. Students will be encouraged to find topics of study for projects based on their own interests and backgrounds. Part of the writing studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0502-459** **Creative Nonfiction**  
This course is an intensive workshop in writing creative nonfiction. Students will explore the principles and techniques of creative nonfiction through critical analysis of published works addressing personal, social, political and/or cultural issues. Students will write in a number of creative nonfiction formats (memoir, the personal essay, travel writing, the science essay, nature writing, sports writing and other kinds of nonfiction prose). Students will explore a full range of creative nonfiction possibilities but will also be able to focus on a particular area of interest. Weekly workshops are held for the discussion of student work in progress. Part of the writing studies concentration and minor; the creative writing minor and science writing minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4 Credit 4 (offered twice annually)**

**0502-460** **Science Writing**  
Artificial intelligence, chaos theory, space radiation ... If science is to successfully move from the lab or the field to the public and popular press, it will need to be divulged by writers who can make information accessible. A good science writer crafts specialized material into clear and compelling, even "poetic," prose. This course will not teach students to write scientific research papers but will teach them to convey complex scientific research for a non-specialist audience without misleading readers or making a spectacle of the science. Students will also read award-winning pieces of scientific journalism and watch what happens when scientific ideas enter popular culture venues. Part of the writing studies concentration and minor and science writing minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-461** **Editing the Literary Magazine**  
Supervision on all aspects of creating a literary and art magazine, with emphasis on writing and editing skills. Hands-on practicum focusing on production of the student-designed magazine, *Signatures*, RIT's oldest continuous literary publication. Part of the creative writing minor; may also be taken as an elective. (0502-227 or equivalent. Students need instructor's permission to register. Contact Professor Roche at 475-4922 or in his office in 06-2106.) **Class 4, Credit 4 (offered annually)**

**0504-462** **Advanced Science Writing**  
The course focuses on literary nonfiction approaches to the expression and explanation of science and technology. Students will select a subject of their own interest: the life and death of stars, brain enhancement and neuroethics, alternative fuels and the next generation of engines. The class places students' own writing at the center of course activities; a considerable part of the class will be given to writing workshops in small groups and to revision of the major essays assigned. The course will trace the process of writing a single long piece. To stimulate student thinking and provide models of a variety of approaches to the science essay, students will read works by essayists, including Alan Lightman, K.C. Cole, Atul Gawande, etc. Participants develop a professional essay that may be eligible for publication in a literary journal or magazine. Part of the writing studies concentration and minor, science writing minor; may be taken as an elective. (0502-227 and 0502-460) **Class 4, Credit 4 (offered twice annually)**

**0504-560** **Special Topics**  
A focused, in-depth study of a selected topic in writing. Specific topics vary according to faculty assigned. See [www.english.rit.edu](http://www.english.rit.edu) for section-specific course descriptions. May be taken as part of the writing studies concentration and minor or the creative writing minor, depending on the topic offered. (0502-227 or equivalent) **Class 4 Credit 4 (offered occasionally)**

## Literature

**0504-210** **Literary and Cultural Studies**  
Students will study literary and cultural texts selected from traditional literature to contemporary media and culture (e.g., literature, film, graphic novels, television, advertising, anime). Students will analyze these texts from a variety of perspectives and become familiar with current debates about literature and/or culture as arenas of human experience. See [www.english.rit.edu](http://www.english.rit.edu) for individual section descriptions. This course will fulfill a humanities core requirement. **Class 4, Credit 4 (offered quarterly).**

**0504-319** **Writing the Disciplines**  
The course emphasizes writing practices within or across disciplines, recognizing the role writing plays in the formation of knowledge and the framing of academic specializations. This course highlights the processes and practices of written expression and the production of research, whether in the sciences or the arts or the humanities. Faculty design specific approaches to the study of the literature of a discipline, field or program. Students have the opportunity to develop a critical understanding of important conversations within a particular area of study and within a larger culturally diverse context. Depending on the focus of the instructor, the course will engage one or more modes of disciplinary expression(s) such as films, written texts, photographs and other images, oral history and ethnography. See [www.english.rit.edu](http://www.english.rit.edu) for section descriptions. (0502-227) **Class 4, Credit 4 (offered quarterly)**

**0504-325** **Honors Literature**  
This Honors core course in literature examines a set of literary texts from disciplinary or interdisciplinary perspectives, using contemporary theoretical and critical approaches. The specific focus of each section indicated in the sub-title of the course reflects both particular scholarly interest and expertise of the professor and an area of literary study that Honors students will find intellectually engaging. This course is conducted in seminar format, class enrollment is limited to 16, and each student is expected to participate fully in seminar discussions and in the oral and written presentation of scholarly research. See [www.english.rit.edu](http://www.english.rit.edu) for section-specific descriptions. Fulfills one of the four Honors core requirements in the RIT Honors program. (0502-227 or equivalent) **Class 4, Credit 4 (offered twice annually)**

**0504-327** **Honors Writing About the Disciplines**  
This Honors course emphasizes writing practices within or across disciplines, recognizing the role writing plays in the formation of knowledge and the framing of academic specializations. This course highlights the processes and practices of written expression and the production of research, whether in the sciences or the arts or the humanities. Students have the opportunity to develop a critical understanding of important conversations within a particular area of study. Depending on the focus of the instructor, the course will engage one or more modes of disciplinary expression(s) such as films, written texts, photographs and other images, oral history and ethnography. **Class 4, Credit 4 (offered quarterly)**

**0504-440** **Drama and Theater**  
Drama as a genre and theater as a performing art. Intensive study of a least one major playwright or period complements a general survey of drama/theater from ancient Greece to modern Broadway. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. Part of the theatre arts minor. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-441** **The Art of Poetry**  
Emphasizes the enjoyment and study of poetry with primary attention to major poetry in English. Part of the literary and cultural studies concentration and minor and the creative writing minor. May also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered twice annually)**

**0504-442** **The Short Story**  
A study of a collection of short stories with critical commentary in order to provide source materials on the nature and development of this genre. Part of the literary and cultural studies concentration and minor and the creative writing minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-443** **The Novel**  
A close reading and analysis of several novels selected to show the range of narrative techniques, methods of characterization and plot construction, and styles representative of the genre. See [www.english.rit.edu](http://www.english.rit.edu) for section-specific course descriptions. Part of the literary and cultural studies concentration and minor and the creative writing minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered twice annually)**

**0504-444** **Film as Literature**  
Examines the nature of narrative in both film and literature, the various aspects of adaptation of literature into film and the relationship between social reality and storytelling in documentary film, utilizing a non-technical approach to the study of film. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-447** **Special Topics: Literature**  
A focused, in-depth study and analysis of a selected advanced topic in literature. Specific topics vary according to faculty assigned. See [www.english.rit.edu](http://www.english.rit.edu) for section-specific course descriptions. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. Part of the science writing minor. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-448** **Biographical Literature**  
Students develop skills to critically read one of the 20th century's most popular literary genres: the various forms of biographical literature. The course distinguishes between biographical and autobiographical literature and asks students to examine and critique the strengths and weaknesses of various forms. Selections attempt to explore lives lived within a variety of cultures. Part of the literary and cultural studies concentration and minor and science writing minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0504-450** **Ibsen: Family and Society**  
Reading and/or viewing plays of Henrik Ibsen, the father of modern drama, enables attentive examination of values and structures of modern society that form and formulate the lives of women and men. Ibsen argues that the possibility of individual freedom and creativity can be won only by seeing beyond and acting in spite of formidable forces. The texts and films are analyzed for visual, as well as verbal, information. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. Part of the theatre arts minor. (0502-227 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0504-454** **Shakespeare: Tragedy/Romance**  
In this course, students will study Shakespeare's unsettling tragedies as well as his surreal romances. Through class discussion, interactive activities and examination of film, students will develop strategies both to investigate the literary and theatrical power of these works as well as to consider their cultural presence in both contemporary American culture and Shakespeare's England. Particular attention will be devoted to Shakespeare in performance, and students may have the opportunity to engage creatively with the plays. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. Part of the theatre arts minor. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-455** **Shakespeare: Comedy/History**  
In this course, students will study Shakespeare's festive comedies as well as his controversial historical plays. Through class discussion, interactive activities and examination of film, students will develop strategies both to investigate the literary and theatrical power of these works as well as to consider their cultural presence in both contemporary American culture and Shakespeare's England. Particular attention will be devoted to Shakespeare in performance, and students may have the opportunity to engage creatively with the plays. Part of the literary and cultural studies concentration and minor; as an affiliated course in the women's and gender studies minor; may also be taken as an elective. Part of the theatre arts minor. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-456** **Dostoyevsky**  
A study in the style, themes and purposes of one of the world's greatest novelists. At least one long novel is read, along with several shorter works. The writer is studied in the context of 19th century Russia and for the implications his works and life continue to have for 21st century Western culture. Part of the Russian language/culture concentration and the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered every other year)**

**0504-457** **Tolstoy**  
A study in the style, themes and purposes of one of the world's greatest novelists. At least one long novel is read, along with several shorter works. The writer is studied in the context of 19th century Russia and for the implications his works and life continue to have for 21st century Western culture. Part of the Russian language/culture concentration and the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered every other year)**

**0504-458** **Walt Whitman**  
In 1967, the Nobel Laureate poet Pablo Neruda said, "We live in a Whitmanesque Age." This course attempts to show Whitman as the "representative man" of his time and to assess the validity of his claim that he initiated the poetry of democracy. It also considers his living and influential presence in his time. Students read Whitman's poetry and some of his (unjustly neglected) prose; selected works by his contemporaries, such as Neruda and Allen Ginsberg. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-459** **Toni Morrison**  
Through reading and discussion of Toni Morrison's novels and feminist and African American critical theory, this course will allow students to follow the development of Morrison's art and to approach her work from alternative critical perspectives. Particular attention will be paid to the role of narrative in African American culture and to Morrison's understanding of its literacy and historical and political function. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) Cross-listed with women's and gender studies, 0522-459. **Class 4, Credit 4 (offered occasionally)**

**0504-460** **Modern Poetry**  
From Walt Whitman's "barbaric yawp" to Emily Dickinson's "letter to the world that never wrote to me" and Baudelaire's "breath of wind from the wings of madness," modern poetry is a body of literature characterized by bold changes in voice, form and subject matter. This course offers a close examination of poetry of the 19th and 20th centuries, with attention to such things as the role played by technological, historical and political developments; what it means to be "Modern" and how other Modern arts movements—for instance, visual arts, music or film—have influenced poetry. Part of the literary and cultural studies concentration and minor; the creative writing minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-461** **Latin American Literature**  
Reading short stories, novels, poetry and essays, as well as viewing films of modern Mexico and Central and South America, reveals a literature and culture wherein the mythic functions as an integral part of the modern world view and the poetic functions as a political power. The impressive vitality of modern Latin American literature can be attributed to its indigenous roots and to its branches that, stemming from a common language and a shared continent, overarch national boundaries and political regimes to form an international literary community. Part of the Latino/Latina/Latin American and minority relations concentrations; the Spanish language/culture concentration and minor; the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-462** **Literature and Technology**  
A study of the relationship between literary expression and technology through primarily, though not exclusively, 19th and 20th century literature. Reading a variety of literary forms from different historical texts and perspectives, we reflect on authors' responses to fears and hopes engendered by developing technologies. Through assigned readings, writings, supplementary media and oral histories, we investigate the impact of technology on our sense of what it means to be human. May be taught with an American studies focus. Part of the science and technology studies concentration; the science, technology and environmental studies minor; the literary and cultural studies concentration and minor, and science writing minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-464** **Myth, Legend and Folklore**  
Scholarly investigation into the rationale, origins and sources of myths, legends and folklore of the western world and the effect these primary forms have had on our literature. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-465** **Viking Myth and Saga**  
Reading the myths, sagas and folktales of the Viking world reveals the values of a people that created the world's oldest extant democratic society. Both women and men fiercely defend their honor and freedom, willing to risk death rather than to bow in submission. The sagas are analyzed as compelling narrative structures and as documents of a culture that continues significantly to shape western civilization. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-466** **Early Black Writers**  
The seeds of African American letters were planted in slavery and bloomed in the Harlem Renaissance of the 1920's. In this course students research and discuss the major contributors to that legacy, a list of writers that includes Phyllis Wheatley, Paul Laurence Dunbar, Ida B. Wells, William Wells Brown, Langston Hughes, Zora Neale Hurston, Countee Cullen and Claude McKay. Part of the minority relations concentration; the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0504-467** **Black Writers Today**  
From the black arts movement of the 1960s to hip hop, this course explores African American writers who inspired a civil rights and cultural revolution. Among the authors are Gwendolyn Brooks, Amiri Baraka, Sonya Sanchez, Gil Scott Herron, Maya Angelou, Rita Dove, Charles Johnson, Kevin Powell, Tupac and KRS-One. Part of the minority relations concentration; the literary and cultural studies concentration and minor; as an affiliated course in the women's and gender studies minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0504-468** **Literary Representations of America**  
A study of the various ways this nation has been portrayed by authors since its founding. Although the emphasis will be on 19th and 20th century American literature, in all its genres, attention may also be paid to international writers' perspectives on America as well as visual and musical portrayals. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0504-469** **New American Literature**  
Walt Whitman described America as a “teeming nation of nations.” Such diversity has not always been represented in American literature. This course explores the contested and complex cultural history of the United States. Beginning with the idea of “discovering” an inhabited land, we examine issues of identity, migration, difference and work in literature presented in historical context. The emphasis is on underrepresented voices in writings by African American, Caribbean, Puerto Rican, Chicano/a, Native and Chinese Americans. This course looks at both the struggle and the possibilities of forging a genuinely democratic literary tradition. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-471** **Irish Literature**  
This course, which is multicultural in approach, will survey the wealth of Irish literature from ancient Celtic sagas to contemporary poetry and fiction. The course will focus on selected early texts (in translation) as well as on selected works of 19th and 20th century writers. We will study particular poems, short stories, plays, novels and essays in the context of Irish history and culture. Part of the literary and cultural studies concentration and minor; may also be taken as an elective (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-474** **British Romantic Literature**  
This course examines the poetry, prose and drama written by British authors during the tumultuous and vibrant period beginning with the onset of the French Revolution in 1789 and ending with the ascension of Queen Victoria in 1837. It was during this period that England experienced the change from an agrarian society in which power began to shift and from which a more democratic and egalitarian society began to emerge. All of the changes and shifts in society are reflected in the literature of the period, making it one of the richest and most varied periods in English history. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0504-476** **Immigrant Voices in American Literature**  
This course examines literary treatments of emigration to and migration across the U.S. Students will read novels, poems and plays and view films by and about the experiences of Chicanos, Caribbean, European and Asian Americans and other immigrant communities. The course may also explore texts dealing with the displacement of Native Americans, the shifting and ambiguous U.S./Mexican border, and the great African American migration. Students will read a selection of essays on the history and politics of immigration. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0504-477** **Survey of Italian Literature**  
This course traces Italian literature of a particular time period. Readings may include novels, short stories, poetry, plays and essays representative of the period, with attention to literary trends and to cultural and historical influences. All readings will be in English translation. See [www.english.rit.edu](http://www.english.rit.edu) for section-specific course descriptions. Part of the Italian language/culture concentration and minor; the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered every other year)**

**0504-479** **Latino Experience in Literature**  
This course presents an overview of the Latino experience in the United States, examining representative works of Hispanic writers. Major Latino groups will be studied (Cuban, Chicano and Mexican Americans, Dominican Americans and Puerto Ricans living in the U.S.). The emphasis is on the interplay between each of these groups, the main society and their place of origin. Special attention will be given to the issues of migration and assimilation. Part of the Latino/Latina/Latin American and Spanish language/culture concentrations; the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-480** **Women in Literature**  
Concentrates on literature by women, about women, primarily from the early 19th century to the present. Considers the aspirations, frustrations and achievements of women as documented by themselves, as well as the perceptions and representations of women in literature by male writers. Works are examined for their literary value as well as their documentation of broader feminist issues. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. Cross-listed with women's and gender studies, 0522-481. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-482** **Science Fiction**  
Isn't the term “science fiction” a paradox, an oxymoron? I mean science is real, verifiable and ‘true,’ right? And fiction is, well, fiction. This course will look at the intersections of art and science in literature, film and perhaps other media. Science and fiction engage in many ways, and the two have allowed for mutual reflection, analysis and generative engagement for quite some time. We will consider how and why narrative and artistic modes of expression serve to make science “public” and how the two “cultures,” as C.P. Snow has famously described the realms of Art and Science, can and do shape one another. Part of writing studies concentration and minor and literary and cultural studies minor and science writing minor; may be taken as an elective. Course requirements include attendance, active participation and three essay exams. (0502-227) **Class 4, Credit 4 (Offered annually)**

**0504-484** **Literature and Religion**  
Exploration of the complexity of religious experience, both personal and cultural, as it is portrayed by writers from biblical times to our own day. The literature is supplemented by readings from such disciplines as psychology, philosophy, history and theology. Part of the religious studies concentration; the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-490** **Autobiography**  
According to poet James Merrill, we live in the age of “me-moir,” at least in American culture. But what happens to the quarrel between truth and fiction, to the forms of language and self-representation, as we move outside of England and America? In this course, we will explore the history and assumptions of traditional autobiographical writing, particularly in the past two centuries. We will examine a rich spectrum of life writings, ranging from formal autobiography to “outlaw” narratives, including selections from diaries, journals and visual self-portraits in art, photography and film. In these works, we will trace new modes of constructing identity as we redefine the boundaries of family, nation, class and gender. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) Cross-listed with women's and gender studies, 0522-484. **Class 4, Credit 4 (offered occasionally)**

**0504-491** **Modern Italian Poetry**  
We will study Italian poetry from the late 19th through the 20th centuries within a cultural and historical context, examining in particular the influences operating between modern Italian poetry and modern poetry in English. Students will read a variety of poems in translation and will have at least one dual language text. When possible, class discussion and lectures will be supplemented by guest lectures on topics such as Italian art, design and history; viewing Italian films, and attending Italian cultural events. Students do not need any knowledge of the Italian language in order to take this course. See <http://www.rit.edu/~langlit.lang.html> for individual section descriptions. Part of the Italian language/culture concentration and minor; the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered every other year)**

**0504-492** **Native American Women's Experience**  
This course examines the unique status of Native American women in tribal and Euroamerican societies. Given the gender complementary construction of many tribal communities, Native women long enjoyed a status and power not found in Europe, but this equality has been altered in many tribes as a result of colonialism. We will study how Native women have responded to assaults on the “feminine principle,” as Paula Gunn Allen terms it. We will examine the following themes in Native women's lives: tribal gender roles, nation, community, family, class, work, race, sexuality, disability, culture-bearing, environment, land, health and representation. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. Cross-listed with women's and gender studies, 0522-492. (0502-227 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0504-493** **Maps, Spaces and Places**  
Space speaks! This interdisciplinary course emphasizes visual literacy and spatial thinking through conventional and digital maps and in diverse novels, poetry and films. We rethink space as a dynamic context for making history, raising questions about authority and organizing social/communal life. From Ondaatje's *The English Patient* to Annie Proulx's Wyoming stories, focus is on the language of mapping and its paradoxes as they shape the work of the cartographic imagination. Requirements include an oral presentation, brief essays and a final community project, such as “Reading Rochester/RIT as Text,” orienteering, digital or picture map research, or geographical information systems analysis. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent). **Class 4, Credit 4 (offered annually)**

**0504-494 Pan-Indian Native American Literature**  
This course examines Native American literature from the end of the Indian Wars, as demarcated by the massacre at Wounded Knee, through the relocation and termination eras to just before the Native American Renaissance. During these years, we witness the emergence of a pan-Indian identity that results in part from colonial policies, such as boarding schools, and results in intertribal political coalitions, such as the Society for American Indians. This course focuses on the literatures generated from this shift in Native consciousness and asks students to consider issues of identity formation. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0504-495 Early Native American Narrative**  
The year 1968 marks the beginning of an era referred to by Kenneth Lincoln as the "Native American Renaissance." Beginning with the publication of Scott Momaday's *House Made of Dawn*, we begin to see the emergence of a substantial body of texts commonly recognized by dominant standards as a "literature." This course seeks to contextualize these late 20th century works in their individual tribal and larger pan-Indian traditions, noting the earlier literary traditions that inform them. We will consider texts commonly conceived of as "metropolitan" as well as those that firmly reject mainstream expectations of literature. Part of the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0504-500 Italian Literature: Special Topics**  
The focus of this special topics course will be determined by the instructor's interest and strength. The course might focus on a particular author, work, genre or time period in Italian literature or it might be thematically organized. Readings may include novels, short stories, poems, plays and essays representative of the time period, author or thematic focus with attention to literary trends and cultural and historical influences. All readings will be in English translation. See [www.english.rit.edu](http://www.english.rit.edu) for section-specific course descriptions. Part of the Italian language/culture concentration and minor; the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered every other year)**

**0504-510 The View from Paris**  
From Charles Baudelaire and Marcel Proust to Assia Djebar and Dai Sijie, modern and contemporary French writers view France and the impact of its global presence from the dominant cultural platform that metropolitan Paris affords. Part of the French language/culture concentration; the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-524 Contemporary Film**  
A study of contemporary world films to be drawn from those presently showing in Rochester area theaters. Emphasis is on both technical and aesthetic aspects of the films. Part of the literary and cultural studies concentration and minor; may also be taken as a liberal arts elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

**0504-545 Deaf American Literature**  
The major focus of this course is "the image of the deaf" and "the deaf experience" as depicted in literature. The course attempts to define "deafness" and the cultural roles it plays in both texts by deaf authors and texts about deaf persons as well as to examine particular literary forms related to the deaf experience. Thus, attention is also given to studying poetry that is created in American Sign Language (ASL), a language primarily used by the deaf American community. Part of the ASL language/culture concentration; the literary and cultural studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered annually)**

## Fine Arts

**0505-213 Fine Arts: Visual Arts**  
Students develop ability in perceiving worth in objects of art through consideration of fundamental concepts in painting, sculpture and architecture involving analysis, interpretation and principles of aesthetics. **Class 4, Credit 4 (offered quarterly)**

**0505-214 Fine Arts: Musical Arts**  
An introduction to music as a fine art. Students develop skills in listening, evaluation and analysis through an examination of music's forms, constituent elements, and stylistic and historical development. **Class 4, Credit 4 (offered quarterly)**

**0505-215 Fine Arts: Film Arts**  
This course will develop students' skills in viewing, analyzing, interpreting and evaluating the art of cinema through an examination of film technology, history, aesthetics and style. **Class 4, Credit 4**

**0505-216 Fine Arts: Theater Arts**  
The course will develop students' skills in viewing, evaluating and analyzing the art of the theater through an examination of its constituent elements, aesthetics, and stylistic and historical development. **Class 4, Credit 4**

**0505-217 Fine Arts: Performing Arts**  
Students study several of the performing arts (e.g., theater, music) together and by doing so develop an understanding of the common and unique aspects of the different performing arts. This understanding is gained through the study of theoretical and aesthetic principles and modes of analysis as well as practical experiences. Students may elect this course to fulfill a liberal arts humanities core course. **Class 4, Credit 4 (offered occasionally)**

**0505-319 Arts of Expression**  
This is a course in Shakespeare's drama that emphasizes the plays as potential theater productions. Studying five or six plays representative of the different acknowledged types of Shakespearean drama (comedy, tragedy, history, problem comedy, romance), students gain a broad understanding of the character and range of Shakespeare's poetic-dramatic art. Experimenting with performance activities such as oral interpretation, character presentation, and scene rendering, they acquire a practical appreciation of Shakespearean drama's theatrical potency, of the original staging conventions, and of how each type of play makes particular generic demands on both performer and spectator. Augmenting the reading and practical expressive activities is a term project: the collaborative realization of a staging interpretation of excerpts from select plays by Shakespeare. No prerequisite. **Class 4, Credit 4 (offered annually)**

**0505-325 Honors Fine Arts**  
Satisfying the fine arts core requirement, this course introduces students to the idea, practice and evaluation of the visual, the musical and the dramatic arts (music, theater, film, painting, sculpture and architecture). The course is organized and taught by a team of fine arts faculty in a format that combines lecture, discussion and practice. The topic of fine arts is treated in three integrated ways: experimental-analytic and program-critical. Students will be expected to read, view, listen to, discuss, research, write about and create works of art. **Class 4, Credit 4 (offered annually)**

**0505-401 RIT Singers**  
RIT's primary choral group performs vocal works dating from the Middle Ages to the present. There is one major performance per quarter and several smaller events throughout the year. Contact Professor Edward T. Schell, music director, for information about participating. Part of the music concentration and minor; may also be taken as an elective. **Class 1, Credit 1 (offered quarterly)**

**0505-402 RIT Orchestra**  
The RIT Philharmonia performs three major concerts per year of standard orchestral repertoire. In addition, students from the philharmonia have the opportunity to play in a variety of chamber ensembles. Participation is by audition. Contact Dr. Michael Ruhling for information. Part of the music concentration and minor; may also be taken as an elective. **Class 1, Credit 1 (offered quarterly)**

**0505-403 RIT Concert Band**  
The RIT Concert Band is a large instrumental ensemble that performs a wide body of literature including traditional marches, wind ensemble pieces, musical medleys and orchestral transcriptions. The group rehearses once a week for two hours in the music room (A128) of the Student/Alumni Union. Students participating in the course are eligible for one credit hour applied toward their individual concentration. The group performs at least one formal concert per quarter as well as several special events throughout the academic year. The group is under the direction of Dr. Jonathan Kruger. Part of the music concentration and minor; may be taken as an elective. **Class 1, Credit 1 (offered quarterly)**



**0505-404** **RIT World Music Ensemble**  
A multicultural ensemble of instrumentalists, singers and dancers organized to explore and perform a variety of music and dance from cultures around the world. The cultures to be studied will depend on enrollment. Participants native to the represented cultures will be enlisted to assist in teaching basic performance practices and concepts. Enrollment is open to all students, faculty and staff who are competent instrumentalists, singers and/or dancers from both Western and non-Western traditions. Auditions will be held to assess proper placement. Contact Dr. Carl Atkins (06-1112, 475-4439) Part of the music concentration and minor; may also be taken as an elective. **Class 1, Credit 1 (offered quarterly)**

**0505-405** **RIT Jazz Ensemble**  
This performing ensemble will provide the opportunity for students to become familiar with and perform a variety of musical styles associated with American jazz. These will include swing, blues, fusion, dixieland, samba, bossa nova, ballad, be-bop and ragtime. As an experiential outcome of such study, the group will prepare a significant assortment of musical compositions for public performance. Part of the music concentration and minor; may also be taken as an elective. **Class 1, Credit 1 (offered quarterly)**

**0505-420** **Applied Music**  
Students will receive private instrumental or voice lessons and participate in studio performance opportunities. Part of the music concentration and minor; may also be taken as an elective. **Class 1, Credit 1 (offered quarterly)**

**0505-421** **Introduction to Museums and Collecting**  
This course examines the history, theory, ideology and practice of collecting within the institutional context of the museum. It considers the formation of the modern museum and, focusing on the American context, it investigates various types of museums: natural history, anthropology, science and technology, history, and art. The course explores the governance and operations of museums in the areas of collections management, collections care and gallery/museum management. The course also analyses the role and function of the museum, considering traditional concerns. The course will examine museums and their practices through the perspectives of colonialism, nationalism, class, race, age, gender and ethnicity. The course will include field trips to local museums and collections. Part of the art history concentration and minor; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0505-422** **Technology of Organic Cultural Materials**  
This is a lecture-studio/lab course on materials and tools, supports and techniques of works of art on paper and other organic art materials. Topics include the application, development and manufacture of artists' materials: drawings, watercolors, furniture, textiles, prints and photographs. This course includes studio reconstructions of masterworks, lectures and library research. Part of the art history concentration and minor; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0505-423** **Technology of Inorganic Cultural Materials**  
This is a lecture-studio/lab course on materials and tools, supports and techniques of inorganic art materials. Topics include the application, development and manufacture of artists' materials: glass, ceramics, sculpture, gilding, pigments and patinas. This course includes studio reconstructions of masterworks, lectures and library research. Part of the art history concentration and minor; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0505-424** **Legal and Ethical Issues for Collecting Institutions**  
This course presents an overview of the legal and ethical issues that govern the collecting of cultural resources. These institutions are governed by national, state and local laws that define how facilities and collections are used. It will consider the evolution of the museum as a public institution and how the legal system increasingly defined minimum standards for maintaining collections, the facilities in which they are housed, and guaranteeing public access and legal standards for the collection. Ethical standards for collecting institutions will also be considered, particularly those that address the responsibilities to a collection, the ethics of acquisition, the question of illicit or stolen material, the issues of human remains and objects of sacred significance and repatriation. Part of the art history concentration and minor; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0505-425** **Display and Exhibition Design**  
This course examines the history and practice of display and exhibition design. It considers the history of display as found in a variety of private collections and the history of exhibitions with the development of museum-like institutions. It investigates various types of displays and exhibitions. The course explores the development concepts in light of budgetary constraints. It considers the professional parameters of display and exhibition design, particularly within institutions, and will consider ethical issues related to materials. It focuses on issues of contemporary concern such as the relationship of the display to the intended public; and educational function vs. entertainment or promotional function. Field trips to local institutions and collections will be included. Part of the art history concentration and minor; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0505-426** **Collections Management and Museum Administration**  
This course presents an overview of the administration and management of museums and their collections. The course examines the governance structure of museums, focusing on personnel responsible for their administration, curation and education, and operations as well as the mission statement and policies they determine. The course also details the management of collections, including the development of a collections policy, management of that policy, documentation and record keeping, acquisitions, and the creation/management of exhibitions. The course considers collections care or preventive conservation, looking at both the facility and collections. Legal and ethical issues will be emphasized. Part of the art history concentration and minor; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0505-427** **Fundraising, Grant Writing and Marketing**  
This course examines the growing autonomy of collecting institutions as they are cut off from various forms of governmental sponsorship and public subsidy and their subsequent needs for raising money from outside, non-traditional sources. The course looks at issues of needs assessment, budgeting and strategic planning. It focuses on the design and implementation of effective fundraising campaigns as well as on the organization and writing of successful grant proposals. It also considers the importance of marketing to overall institutional success; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0505-431** **Topics in Baroque Art**  
This course will focus on Italian artists working in Rome from circa 1590 to circa 1660. Although we will explore painting, sculpture and architecture in this particular sequence and more or less chronologically, we will often have the chance to consider how these media coalesce to create an overwhelming visual experience. We will pay particular attention to major commissions given to Annibale Carracci, Michelangelo da Caravaggio, Gianlorenzo Bernini and Francesco Borromini as we seek to define the nature and meaning of the Roman Baroque. Part of the art history concentration and minor; may also be taken as an elective. Cross-listed with CIAS. **Class 4, Credit 4 (offered occasionally)**

**0505-432** **Renaissance Painting: Flanders**  
This is the study of the history of Renaissance painting in the Southern Netherlands from the first half of the 15th century to the end of the 16th century. We will examine such problems as the meaning of the Renaissance in Flanders; the observation and recording of natural appearances; "hidden symbolism" and sacramental themes in Early Netherlandish painting; the connections between Flemish, German and Italian art; the development of new genres in the 16th century; "originality" and "artistic progress." The Master of Flemalle, Jan van der Goes, Hans Memling, Gerard David, Quinten Metsys, Hieronymus Bosch, Joachim Patinier, Pieter Aertsen and Pieter Breughel the Elder are among the artists to be studied. Part of the art history concentration and minor; may also be taken as an elective. Cross-listed with CIAS. **Class 4, Credit 4 (offered occasionally)**

**0505-433** **15th Century Art and Architecture of Florence and Rome**  
The subject of this course is 15th century painting, sculpture and architecture in Florence and Rome. We will approach this material in a more or less chronological order as we focus upon a series of important commissions. Questions for consideration will include the nature and meaning of the Italian Renaissance; developments in artistic theory and practice; the importance of Antique and Medieval precedents; the increasing attention to the effects of nature; the rising status of the artist; the role of the patron; and the relevance of documents, literary sources and visual precedents for our interpretation of images. Part of the history concentration and minor; the Italian language/culture concentration and minor; may also be taken as an elective. Cross-listed with CIAS. **Class 4, Credit 4 (offered occasionally)**

- 0505-434**                      **16th Century Art and Architecture of Florence and Rome**  
The subject of this course is 16th century painting, sculpture and architecture in Florence and Rome. We will approach this material in a more or less chronological order as we focus upon a series of important commissions. Questions for consideration will include the nature and meaning of the Italian Renaissance; developments in artistic theory and practice; the importance of Antique and Medieval precedents; the increasing attention to the effects of nature; the rising status of the artist; the role of the patron; and the relevance of documents, literary sources and visual precedents for our interpretation of images. Part of the art history and Italian language/culture concentrations and minors; may also be taken as an elective. Cross-listed with CIAS. **Class 4, Credit 4 (offered occasionally)**
- 0505-435**                      **Russian Art: 10th Through 20th Century**  
This course will trace the evolution of Russian art from the adoption of Christianity in 988 to the end of the 20th century through Gorbachev's Perestroika to the present day. The course will highlight major historical events and artistic schools/works that contributed to creating the unique phenomenon of Russian culture. The course embraces such major art forms as architecture, painting and sculpture as well as elements of decorative and folk art. Part of the Russian language/culture concentration; the art history concentration and minor; may also be taken as an elective. Cross-listed with CIAS. **Class 4, Credit 4 (offered occasionally)**
- 0505-436**                      **Women's Stories and Films**  
This course will provide an introduction to women's films through an exploration of narrative structure in films made by women. Through film screenings and class discussion, the course will examine the themes and issues of women's narratives and how they are presented in the medium of film. The hero's journey and traditional narrative structure will be contrasted with the heroine's journey and the more personal storytelling style of the feminine. The course will also examine differences between films made by women and films made by men about women. The course will introduce the work of feminist film critics and consider the relevance of those theories to women's roles in current films. The course will view women's storytelling in a context of feminine mythology and women's psychology; may be taken as an elective. Cross-listed with CIAS 2065-473 and women's and gender studies 0522-436. **Class 4, Credit 4 (offered annually)**
- 0505-437**                      **Forensic Investigation Art**  
This course introduces the study and examination of artistic and historic materials within a humanities-oriented forum in which students present and debate published research on several famous case studies including the Shroud of Turin, the Getty Kouros, and the Han van Meegeren forgeries of Vermeer paintings. Emphasis will be on using resources from the interdisciplinary fields of art history, art and materials science supported by a virtual lab in which the application of instrumental techniques to the materials is demonstrated. Part of the art history concentration and minor; may be taken as a liberal arts elective. No prerequisite. **Class 4, Credit 4 (offered annually)**
- 0505-438**                      **Introduction to Art Conservation**  
This course examines the philosophies, ethics, art conservation methods and principles of collection management. An overview of deterioration characteristics and conservation strategies for a variety of materials, including stone, glass, ceramic, wood, paper, new media, metals, textiles, oil paintings and archaeological materials will be presented. Part of the art history concentration and minor; may be taken as an elective. No prerequisite. **Class 4, Credit 4 (offered annually)**
- 0505-442**                      **Music in the U.S.**  
A survey of music in the United States from the time of European colonization to the present. Particular emphasis is placed on the question of what makes music distinctively American. Part of the American artistic experience and ESL concentrations; the music concentrations and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0505-443**                      **Images of American Life**  
Students examine images of American life in the 19th and 20th centuries in the visual arts, particularly photography, to analyze and evaluate the influences of American political, social and cultural events on imagery and perception. Part of the American artistic experience concentration; the art history concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0505-444**                      **American Painting**  
A survey of the style and meaning in American paintings from the colonial limners to contemporary artists. Centers on what distinguishes painting of the colonies and of the United States from its European counterpart. Part of the American artistic experience and ESL concentrations; the art history concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0505-445**                      **Issues in American Art**  
A comprehensive overview of American attitudes and philosophies as they have shaped and been embodied in our artistic heritage. Emphasis is on American art from 1850 to the present. Part of the American artistic experience concentration; the art history concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered regularly)**
- 0505-446**                      **American Film in the Studio Era**  
This course examines the history and aesthetics of the motion picture in the U.S. during the classical Hollywood studio period. Emphasis will be on the analysis of both the work of major American film makers and the evolution of major American film genres. Among the filmmakers to be studied are Griffith, Chaplin, Hawks, Ford, Capra, Welles, Hitchcock, Wilder and Kubrick. Genres to be covered include the melodrama, silent comedy, screwball comedy, western, thriller, film noir and gangster film. The films will be studied within the context of contemporary cultural and political events and will be discussed from several viewpoints. Part of the American artistic experience concentration; the art history concentration and minor; may also be taken as an elective. Part of the theatre arts minor. **Class 4, Credit 4 (offered occasionally)**
- 0505-447**                      **American Musical Theater**  
Survey of the development of American opera and the American musical theater, highlighting representative works, composers, librettists and performers of both the cultivated and vernacular traditions. Part of the American artistic experience concentration; the music concentration and minor; may also be taken as an elective. Part of the theatre arts minor. **Class 4, Credit 4 (offered annually)**
- 0505-448**                      **20th Century American Music**  
Survey of both the cultivated and vernacular traditions of American music in the 20th century, taking into account its political, social and historical frameworks. Part of the American artistic experience concentration; the music concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**
- 0505-449**                      **Music Theory I**  
For the student who is able to read music notation. In addition to the writing of melody, two-part counterpoint and four-part harmony, some attention is given to the analysis of form and style. Part of the music concentration; may also be taken as an elective. **Class 4, Credit 4 (offered twice annually)**
- 0505-450**                      **Music and the Stage**  
A historical and cultural survey of collaboration between the arts of music and theater, focusing on a selection of significant creative products that combine music and drama. Included are works by Shakespeare, Monteverdi, Moliere, Mozart-DaPointe, John Gay, Beethoven-Goethe, Wagner, Puccini, Brecht-Weill, and Bernstein, spanning the genres of Renaissance tragedy and comedy, opera seria, opera buffa, ballad opera, incidental music, romantic drama, Italian opera, music drama, epic theater, cabaret, vaudeville and musical comedy. Part of the music concentration and minor; may also be taken as an elective. Part of the theatre arts minor. Part of the theatre arts concentration. **Class 4, Credit 4 (offered occasionally)**
- 0505-452**                      **Special Topics: American Art**  
A critical examination of issues and/or artistic developments in American art. The topic may have been briefly covered in another concentration course. Provides a unique opportunity to expose the student to an in-depth analysis of one selected aspect of American art. Examples of likely topics are: American landscape painting; American portraiture; pop art of the '60s; jazz; Robert Venturi and post-modern architecture in America; criticism and theory; or other topics dealing with American painting, sculpture, architecture, music and film. Part of the American artistic experience concentration; the art history concentration and minor; may also be taken as an elective. Prerequisites, if any, are determined by the instructor. **Class 4, Credit 4 (offered occasionally)**

**0505-453 Theater in the U.S.**  
A broad survey of theater in the United States, designed to acquaint students with the main figures, companies, plays, productions and stylistic currents that have defined the American stage since the Revolution. Emphasizes the native and multicultural features of our theater's development while taking due note of the influences from Europe. Also introduces students to some of the impulses, both traditional and avant garde, that have characterized the American theater since mid-century. Part of the American artistic experience and ESL concentrations; may also be taken as an elective. Part of the theatre arts minor. Part of the theatre arts concentration. **Class 4, Credit 4**

**0505-454 Orchestra Repertoire and History**  
A survey of the history and development of the orchestra and its repertoire from the Baroque to the present, focusing on works commonly performed by American orchestras. In conjunction with concert attendance requirements, special attention is given to works performed by area orchestras. In addition, various business, legal, cultural and artistic aspects of the modern American orchestra are addressed. Part of the American artistic experience concentration; the music concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0505-455 Survey of Jazz**  
This course will survey the development of American jazz, highlighting representative composers and performers and significant works. Particular attention will be drawn to the multi-racial influences on the creation of jazz music and its relationship to American culture as a whole. Part of the American artistic experience concentration; the music concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0505-456 Topics in Music History**  
This course is a study of various aspects of music in different historical environments with emphasis on analogies between music and the other arts. Part of the music concentration and minor; may also be taken as an elective. Students may register for course only with permission of the instructor. **Class 4, Credit 4 (offered occasionally)**

**0505-457 Contemporary Drama, Theater and Media**  
This course will examine some recent trends in American drama and theater, focusing largely on the apparent influence of television and other mass media on playwriting and performance conventions from the past two decades. Central to the course will be an examination of how traditional models of playwriting and performance rooted in casually-oriented narrative have been abandoned or at least undermined by a number of contemporary American theater artists. The course will survey a range of plays and performances that in terms of structure reflect some of the representational practices of post-1980 American television programming. Part of the American artistic experience concentration; may also be taken as an elective. Part of the theatre arts minor. Part of the theatre arts concentration. **Class 4, Credit 4 (offered occasionally)**

**0505-458 Modernist European Theater**  
This course will provide an overview of several major movements associated with modern European drama and theater, with a survey of various plays associated with these movements. These plays will be situated within appropriate historical contexts to illuminate the significance of the works. Emphasis will be on how the various plays and movements, while employing similar devices and conventions, nonetheless differ from each other in tenor and content and, in the end, toward which they were directed; may be taken as an elective. Part of the theatre arts minor. Part of the theatre arts concentration. **Class 4, Credit 4 (offered occasionally)**

**0505-459 Era of Haydn and Mozart**  
Many of the characteristics of art music up to the present day have their beginnings in the late 18th century. This course explores the creation and performance of music within the context of European cultural, political and artistic ideals from 1740 to 1800, with particular attention given to the works of Haydn and Mozart. Part of the music concentration and minor; the German language/culture concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0505-461 World Music I**  
A course designed to explore selected music cultures of North America, South America and Africa through an examination of their musical, sociological, philosophical and aesthetic values. The primary goal of the course will be to expand understanding of and perceptions about music, both outside and within Western cultural traditions. The methodology will involve using traditional techniques of music analysis and comparative musicology, along with special techniques for listening to and analyzing non-Western music, in an examination of musical elements, music-making processes, instruments, the function/purposes of music in various cultures, and selected readings from allied disciplines. Students will have opportunities for experimental (hands-on) activities, depending on size and make-up of the class. Part of the music concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0505-462 World Music II**  
This course will explore selected music cultures of India, Asia, East Asia and Central/Southeastern Europe through an examination of their musical, sociological, philosophical and aesthetic values. The primary goal of the course will be to expand understanding of and perceptions about music, both outside and within Western cultural traditions. The methodology will involve using traditional techniques of music analysis and comparative musicology, along with special techniques for listening to and analyzing non-Western music, in an examination of musical elements, music-making processes, instruments, the functions/purposes of music in various cultures, and selected readings from allied disciplines. Students will have opportunities for experimental (hands-on) activities, depending on size and make-up of the class. Part of the music concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0505-463 Survey of African American Music**  
This course is a survey of the history of African American music through an examination of the major forms of music making and dance developed among African Americans in the United States from the early 17th century to the present. A brief introduction to West African cultural characteristics, especially music and dance, as well as discussion of the African diasporas in the New World will serve as background for this survey. Part of the American artistic experience concentration; the music concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0505-464 Blues Personal and Social Commentary**  
A course designed to explore the African American folk form known as the blues. While tracing the history of this unique form frames the course, particular emphasis is placed on understanding the blues as a window into the personal lives of those who perform it and viewing the blues as a vehicle for social commentary. Part of the American artistic experience concentration; the music concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0505-466 Sounds of Protest**  
This course is designed to explore the variety of ways music has served as commentary on, and/or symbolic representation of, social circumstances and events in America and selected world cultures, historically and in the present. Students will research, listen to, analyze and discuss music representing a variety of genres, styles and cultures, ranging from selected non-western music to various forms of European and American folk, popular, and concert music. Students will place this music in context through reading and discussion of writings on the arts, education, sociology, history, ethnomusicology, critical theories, and biography, writers and critical thinkers and topics including race, gender, sexuality, economics, class, war, and politics, among others. Part of the American artistic experience concentration and music minor; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0505-467 American Film Since the Sixties**  
This course examines the history and aesthetics of the motion picture industry in the U.S. since the late 1960s, when the classical studio period ended. Emphasis will be on the analysis of both the work of major American filmmakers and the evolution of major American film genres. Among the filmmakers to be studied are Altman, Coen, Scorsese, Allen, Coppola, Seidelman, Lee, Tarantino and Lynch. The course will consider the evolution of the traditional Hollywood genres, the development of new genres, the rise of the blockbuster, the rise of the independents and the aesthetic changes that have occurred since the 1970s. Part of the American artistic experience concentration; the art history concentration and minor; may also be taken as an elective. Part of the theatre arts minor. **Class 4, Credit 4 (offered occasionally)**

**0505-468** **Art of India and Southeast Asia**  
A survey outlining the development of art in India and Southeast Asia examining the philosophical circumstances that distinguish Eastern artistic traditions. There is opportunity for each student to pursue a special interest in depth. Part of the art history concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0505-469** **Art of China, Korea and Japan**  
A survey outlining the development of art in China, Korea and Japan examining the philosophical circumstances that distinguish Eastern artistic traditions. There is opportunity for each student to pursue a special interest in depth. Part of the art history, Chinese language/culture and Japanese language/culture concentrations; the Japanese language/culture minor; the art history concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0505-470** **American Popular Song 1830–1950**  
This course will survey the American popular song and its composers and performers, taking into account the political, social and historical perspectives reflected in this commercial part of the vernacular music tradition. Part of the American artistic experience concentration; the music concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0505-471** **American Popular and Rock Music**  
This course examines the history and elements of popular and rock music in the U.S. from the end of the 19th century to current times. Emphasis will be on the music that was written and performed after World War II. Students will be introduced to various styles of this genre as well as to those musical elements necessary to define a rudimentary analysis of the music. Among the composers and performers to be studied are early minstrel-show performers, Louis Armstrong, Scott Joplin, George Gershwin, blues musicians, Benny Goodman, Frank Sinatra, R & B musicians, Elvis Presley, Ray Charles and Jimi Hendrix and the country and western, folk, disco, punk, metal, grunge and pop genres. Part of the American artistic experience concentration; the music concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0505-480** **Women and the Visual Arts**  
Examines the image of women in the visual arts and the role of women as image makers. Major topics include the variety of images of women, the evolution and change of these images over time, media images (as differentiated from fine art images) of women, images of women by women and by men, women's images and the issues of their relationship to the images made by men, the nude and pornography, history of women artists, selected women artists and their work, relation of their work to the art of the period, current issues and status of women artists. Part of the art history concentration and minor; may also be taken as an elective. Cross-listed with women's and gender studies 0522-480. **Class 4, Credit 4 (offered occasionally)**

**0505-482** **Beethoven**  
Introduction to the music of Beethoven in the psychological, political and philosophical contexts that gave it shape and force. Using the classical style of Haydn and Mozart as background, focuses on the development of the "Dionysian" personality in Beethoven's compositions and the creation of the sublime in music. Part of the German language/culture concentration and minor; the music concentration and minor; may also be taken as an elective. (0505-459) **Class 4, Credit 4 (offered occasionally)**

**0505-483** **Bach and the Baroque**  
A study of Johann Sebastian Bach, his life and times, and his music in the context of Baroque styles and aesthetics. Compositions from each of the major periods of his creative life are examined and discussed, particularly as they serve the social and religious purposes for which they were written and as they reveal the psychology of so-called Rhineland mysticism. Part of the German language/culture concentration and minor; the music concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0505-484** **Romanticism in Music**  
Survey of the rise of German Romanticism from Beethoven to Strauss in the context of the development of 19th century musical styles in general. Part of the German language/culture concentration and minor; the music concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0505-485** **Music Theory II**  
For the student who has completed Music Theory I or a comparable program of study. In addition to the continuing study of melodic construction and development, thematic development in two-part counterpoint, four-part harmony, and analysis of form and style, emphasis is on the development of individual musical skills. Part of the music concentration and minor; may also be taken as an elective. (0505-449) **Class 4, Credit 4 (offered annually)**

**0505-486** **German Theater and Drama**  
A broad survey of German-language plays and theater styles since 1800 (all materials in English translation). Chief focus is on the dramas and theater practice of Bertolt Brecht (Threepenny Opera, Mother Courage and Her Children, Good Person of Szechwan, Life of Galileo, The Caucasian Chalk Circle). Emphasis is given also to developments in German theater through the period of the Berlin Wall (erected 1961, demolished 1989) and in the first decade after Germany's reunification. Class method includes practical experimenting with theatrical presentation. Part of the German language/culture concentration and minor; may also be taken as an elective. Part of the theatre arts minor. Part of the theatre arts concentration. **Class 4, Credit 4 (offered annually)**

**0505-487** **Art of Islam**  
A survey of artistic traditions (to include architecture, decorative arts, art of the book and painting) from the seventh century onwards in countries from Asia, Africa and Europe that were influenced by the religion of Islam. There will be an opportunity for each student to pursue special interests in depth. Part of the Arabic language/culture concentration; the art history concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0505-489** **Theater Production Seminar and Workshop**  
Using seminar and workshop approaches, this course involves students in production dramaturgy (research applied to the staging of a play). These activities are then applied to preparing a production of that play. The specific features of both the dramaturgical and production activities will necessarily vary depending on the play being produced. As a rule, dramaturgical research will consist of examining the play in question both as a particular idiosyncratic work with its own unique internal characteristics and as a work situated within larger theatrical and dramatic contexts. This research will commonly include a consideration of the social, political and cultural contexts from which the play emerged as well as the particular theatrical conditions that influenced its formation; may be taken as a liberal arts elective. Part of the theatre arts concentration. **Class 4, Credit 4 (offered annually)**

**0505-502** **Shakespeare: Dramatist**  
This is a course in Shakespeare's drama that emphasizes the plays as potential theater productions. Studying five or six plays representative of the different acknowledged types of Shakespearean drama (comedy, tragedy, history, problem comedy, romance), students gain a broad understanding of the character and range of Shakespeare's poetic-dramatic art. Experimenting on selected production activities, they acquire a practical appreciation of Shakespearean drama's theatrical potency, of the original staging conventions, and of how each type of play makes particular generic demands on both the reader and spectator. Augmenting the reading and practice work is a term research project focused on the history of a single play's staging interpretation; may be taken as an elective. Part of the theatre arts minor. Part of the theatre arts concentration. **Class 4, Credit 4 (offered occasionally)**

**0505-510** **Senior Thesis in Cultural Resource Studies**  
This is the final requirement in the degree program. Students will formulate a research question that will entail some physical interaction with objects. They will conduct the appropriate research to address that question and will present their results in both written and oral formats. The course provides students the opportunity to develop their research and hand skills and to share the results with the department faculty and students. (0505-437 Forensic Investigation of Art) Required course for the cultural resource studies program. **Class 4, Credit 4 (offered annually)**

## History

**0507-301** **Modern American History**  
An analysis and interpretation of main themes in United States history from the Civil War/Reconstruction Era (1865-1877) through contemporary America. **Class 4, Credit 4 (offered quarterly)**

**0507-302** **Modern European History**  
The course is an analysis of the political, social, economic, cultural and military events that have characterized the history of Europe from the modern period to the 20th century. Emphasis will be given to the ideas, events, movements and developments that have shaped the civilization of Europe and have contributed to the transformation, development and enrichment of other civilizations. One of the major goals of the course is not only to convey factual knowledge about the history of Europe from modern times to the 21st century but to provide the historical and co-intellectual framework from which emerges the interconnection between European civilization and the rest of the world. **Class 4, Credit 4 (offered quarterly)**

- 0507-305 American History: Special Topics**  
Like the department's core course, Modern American History, this course will examine the political, social, cultural and economic development of the American people in the modern period and study the United States in its foreign relations. The difference is that this course will do so by focusing on specific themes or topics to be chosen by the instructor, announced in the subtitle and developed in the course syllabus. For more information about American History Special Topics courses, see [https://www.rit.edu:8080/\\_proxy\\_/www.rit.edu/~696www/](https://www.rit.edu:8080/_proxy_/www.rit.edu/~696www/). **Class 4, Credit 4 (offered quarterly)**
- 0507-306 European History: Special Topics**  
Like the department's core course, Modern European History, this course will examine the political, social, cultural and economic development of the European people in the modern period and study Europe in its foreign relations. The difference is that this course will do so by focusing on a specific theme or topic, to be chosen by the instructor, announced in the subtitle and developed in the course syllabus. **Class 4, Credit 4 (offered quarterly)**
- 0507-325 Honors History**  
Like the department's core course, Modern American History, this course will examine the political, social, cultural and economic development of the American people in the modern period, and study the United States in its foreign relations. The difference is that this course will do so by focusing on a specific theme or topic, to be chosen by the instructor, announced in the subtitle, and developed in the course syllabus. **Class 4, Credit 4 (offered occasionally)**
- 0507-401 American Women: Colonies to 1848**  
This course considers the history of American women from the colonial era to the Seneca Falls convention. We will examine the experience of women of different races and classes across the country, looking at Puritans in Massachusetts and at planters' daughters in the Carolinas; at female slaves in the deep South and at mill workers in the urban North. We will investigate the impact of the American Revolution on women, and we will also trace the emergence of the women's rights movement, culminating in the convention at Seneca Falls. Part of the history concentration; the American history minor; may also be taken as an elective. Cross-listed with women's and gender studies 0522-402. **Class 4, Credit 4 (offered occasionally)**
- 0507-402 American Women: 1848 to Today.**  
This course considers the history of American women from the Seneca Fall Convention to the present. We will trace the impact of the first women's rights convention and follow the story of the struggle for the vote. We will also consider the role of women in other important 19th century reform movements, including abolition, temperance, spiritualism and progressivism. We will also look at the varied experience of women in the 20th century from birth control to second-wave feminism to co-education. Part of the history concentration; the American history minor; may also be taken as an elective. Cross-listed with women's and gender studies 0522-402. **Class 4, Credit 4 (offered occasionally)**
- 0507-410 Terrorism, Intelligence and War**  
Investigates the historical, political, moral and legal dimensions of terrorism and intelligence. Uses a case-study approach with themes that include just-war theory, terrorism in the colonial and post-colonial worlds, domestic terrorism and mechanisms of intelligence and covert operations. Part of the history concentration and the American history and the modern world history minors; may be taken as liberal arts elective. **Class 4, Credit 4 (offered annually)**
- 0507-411 Origins of U.S. Foreign Relations**  
Analyzes the roots of U.S. foreign policy, beginning with the American Revolution and continuing through the Spanish-American War. Examines the development of the U.S. from a small 18th century experiment in democracy to a late 19th century imperial power. Topics include foreign policy powers in the Constitution, economic development, continental and overseas expansion, and Manifest Destiny. No prerequisite. Part of the history concentration and the American history and modern world history minors; may be taken as a liberal arts elective. **Class 4, Credit 4 (offered annually)**
- 0507-412 Modern Japan in History, Fiction and Film**  
An introduction to modern Japanese history, highlighting social and aesthetic traditions that have formed the foundation for Japanese literature and cinema. Explores how writers and directors have drawn on this heritage to depict historical experiences. No prerequisite. Part of the history concentration and the modern world history minor; may be taken as a liberal arts elective. **Class 4, Credit 4 (offered annually)**
- 0507-440 U.S. Social and Intellectual History**  
Examines main themes in U.S. social history—immigration, ethnicity, urbanization—and major themes in intellectual history; the question of national character; salient facets of American ideas and institutions, and leading historiographical assessments of the American experience. Part of the history and ESL concentrations; the American history minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-441 Modern U.S. Foreign Relations**  
Examines the late 19th century emergence of the United States as an imperial power and its development into a 20th century superpower. Topics include American politics and foreign policy; the influence of racial and cultural ideologies on policy; isolation and intervention; the Cold War; and the Iraq wars. Required course for international studies majors. Part of the history and global studies concentrations; the history of the modern world minors; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-442 Contemporary Middle East**  
Analyzes the making of the contemporary Middle East from the rise of Islam to the present with special emphasis on the patterns of political development in the 20th century. Part of the history, international relations and Arabic language/culture concentrations; the history of the modern world and international relations minors; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-443 European Social and Intellectual History**  
The course analyzes the major political, social, intellectual and economic events in Europe since 1600. Special emphasis will be placed on the meaning of the Scientific Revolution: on the political and constitutional systems from Locke to contemporary democracies; on the Enlightenment and its mentality of reason, freedom, skepticism and toleration; on Church and State relations; on the society, culture and literature ideologies of left, center and right; and on the modern and contemporary sociological and philosophical movements (positivism, realism and modern ethical trends); and present European economic globalism. Part of the history concentration; the European history minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-444 Strategy and Diplomacy of Europe**  
Investigates the origins and outcomes of the two World Wars with special emphasis on the conflicting strategies and secretive diplomacy adopted by the European Great Powers between 1871 and 1945. Part of the history and international relations concentrations; the history of the modern world, European history, and international relations minors; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-445 Modern Latin America**  
Survey of the historical development of the Hispanic and Portuguese areas of the Americas from independence through the mid-20th century. The movement towards independence, the problems that emerged during the 19th century of forming unified nations and the problems of modernization in the 20th century are all covered. The histories of selected countries are used to illustrate these issues. Part of the history, Spanish language/culture, and Latino/Latina/Latin American concentrations; the Spanish language/culture and history of the modern world minors; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-446 Europe Since 1945 and the European Union**  
The course analyzes the major changes that have affected Europe since 1945. The focus will be on the political and economic process of European integration from the Organization for European Economic Cooperation to the Treaty of Maastricht; from the Single Market to the single currency; from the Common Market to transatlantic cooperation between the European Union and the United States; from Détente and Perestroika to the new relations between the European Union and the Eastern European countries; from Keynesian neocapitalism to economic globalism; and the new partnership between the European Union and the countries of the Mediterranean, the Middle East, Africa, Latin America and Asia. Part of the global studies and history concentrations; the European history and history of the modern world minors; may also be taken as an elective **Class 4, Credit 4 (offered occasionally)**
- 0507-447 U.S. History Since 1945**  
An analysis of the major themes characterizing post-World War II United States history. Investigates the specific characteristics of America as a modern state. Selected themes include intellectual, cultural, political and military aspects. Part of the history concentration; the American history and history of the modern world minors; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

- 0507-448 History of Russia to 1917**  
An exploratory inquiry into the historical foundations and unfolding of Russian history up to the revolutions of 1917, featuring topics such as the Vikings' role in early Russia; the Kievan era; the Mongol domination; the evolution of serfdom; the reigns of Ivan the Terrible, Peter the Great, and Nicholas and Alexandra; and the revolutionary leaders and movements, concluding with an investigation into the reasons for and the story of the decline and fall of Tsarist Russia. Part of the history and Russian language/culture concentrations; the European history and history of the modern world minors; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-449 History of Russia Since 1917**  
An inquiry into the course of Russian history in the late 19th, 20th and early 21st centuries featuring exploration of such key topics as the birth, leadership and teachings of Russia's revolutionary parties, the conditions and forces leading to and the events in the revolutions of 1905 and 1917, the Civil War, the formation and consolidation of the Soviet Union under Lenin, the struggle for power between Stalin and Trotsky, planned industrialization, the collectivization of agriculture, the purges and other salient features of Stalin's rule, the battle with Germany in World War II, the reigns of Krushchev, Gorbachev and Yeltsin, and Russia's prospects for the future under Putin. Part of the history and Russian language/culture concentrations; the European history and history of the modern world minors; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-450 Stalin, Mussolini, Hitler: Europe of the Dictators**  
An exploration of key developments in European history during the years from 1918 to 1945 featuring in-depth inquiries into the political, territorial, economic and social consequences of World War I; the origins, nature and significance of the socialist regime under Joseph Stalin in the Soviet Union, the fascist regime under Benito Mussolini in Italy, and the Nazi regime under Adolph Hitler in Germany; the disintegration of the international order in the inter-war years; and the outbreak and course of World War II. Part of the history concentration; the history of the modern world and European history minors; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-451 Rochester History**  
Explores the history of the local community, the history of Rochester, New York, with special focus on its important place in national issues like cutting edge transportation, women's rights, abolition and modern business. Part of the history concentration; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-453 U.S./Latin American Diplomatic History**  
The emphasis is on analyzing the United States' relations with Latin America from independence to the present. Part of the history concentration; the Spanish language/culture concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-456 U.S. and Third World Revolution**  
One of the dominant features of the 20th century has been the revolution of rising expectations in the countries of the Third World. Students study the underlying causes of these revolutions and the reaction of the United States government to this revolutionary ferment in Latin America, Asia and Africa. Part of the history concentration; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-457 History of American Popular Culture**  
American myths, icons, heroes and institutions as represented in American popular culture from the late 19th century to the present. Examines the history of popular entertainment and the mass media in the United States. Part of the history and ESL concentrations; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-460 Revolutionary Leaders of Latin America**  
In this course three movements are studied: the rise of Juan Peron in Argentina in the 1940s, Fidel Castro's revolution in Cuba, and Salvador Allende's electoral victory in Chile in 1970. By studying these three "revolutionary" movements, the student comes to an understanding of the historical perspective and nature of social discontent in Latin America. Part of the history concentration; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-461 The Renaissance World**  
The thematic study of the Renaissance in Europe from 1300 to 1600. The course explores the art, literature, philosophy, society and institutions of the Renaissance that have contributed to the revival of the Western culture and heritage. Part of the history concentration; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-462 Civil War and Reconstruction**  
A course that examines the Civil War era (1850s-1870s) from military, social and political perspectives. Students will consider the causes of the war, its development between 1861 and 1865, and some of its consequences in American society during the Reconstruction era. Part of the history concentration; the history of the modern world minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-463 American Deaf History**  
Traces the history of the deaf community in a transatlantic context. The history of deaf education in the West will be examined in detail. The historical development of the American deaf community will be given special attention. The distinctive culture of the American deaf community, together with its language and literature, will also be considered. Part of the history and ASL language/culture concentrations; the American history minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**
- 0507-464 Environmental Disasters in American History**  
Students will study the ways in which environmental disaster has impacted American thought, culture and politics. The course will focus on a range of topics, such as natural disasters, man-made disasters, western expansion, the technological domination of nature, and conservation and environmental politics. Part of the history and environmental studies concentrations; science, technology and environmental studies minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-465 Survey of African American History**  
This course examines the history of African Americans from the colonial era through the 20th century. Students will consider a variety of themes: the Middle Passage, the creation of slave cultures, resistance to enslavement and the rise of free black communities, emancipation, civil rights struggles in the 20th century and several other topics. Part of the history concentration; the American history minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0507-466 American Slavery, American Freedom**  
This course examines debates over the institution of slavery and the meaning of freedom in antebellum American society. Students will study the history of enslavement in American society before the Civil War, including such topics as the creation of slave culture, slave rebellion and relations between masters and enslaved people. In addition, students will study movements against slavery by abolitionists, politicians and free black activists. Part of the history concentration and history of the modern world minor; may also be taken as an elective. Part of the legal studies minor. **Class 4, Credit 4 (offered occasionally)**
- 0507-467 American Disability History**  
This course considers the issue of disability in American life. We will examine a variety of disabilities within different historical contexts, including literary, cinematic, and cultural in order to answer the following questions. What is a disability? Who decides? Can a condition be considered a grave disability in one culture but go nearly unnoticed in another? Is a disability a biological or a social construction? What can we learn by considering these issues from a disabled point of view? Part of the history concentration; the American history minor; may also be taken as an elective. Part of the legal studies minor. **Class 4, Credit 4 (offered occasionally)**
- 0507-468 The United States and Japan**  
Examines the U.S.-Japan relationship from the perspectives of diplomacy, economics and culture. Fluctuating sharply during its 150 years, this relationship has featured gunboat diplomacy, racial conflict, war and alliance. The course investigates U.S.-Japan relations in the contexts of modernization, imperialism, World War II and the Cold War. Part of the history and Japanese language/culture concentrations and the history of the modern world and Japanese language/culture minors; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**
- 0507-469 Special Topics: History**  
Topics will vary, but the course number will remain the same. Be sure not to repeat the same topic; may be taken as liberal arts elective. (0507-301 or 0507-302 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0507-470** **European Union and America in the 21st Century**  
The course analyzes the emergence of the 25-nation European Union as an economic superpower and the steady decline of the U.S. as a global power. The unexpected shift in American attitude—from the principles of natural harmony between nations, commitment to peace and condemnation of war as an irrational act of evil to unilateralism, automaticism, military intervention and constant threats of retaliatory actions anywhere and everywhere in the world—has generated a deep divide between the European Union and the U.S. Today, America seems less secure, fears the future and resents the economic competition and challenge of the European Union. Part of the history concentration and the modern world history minor; may be taken as an elective. No prerequisite. **Class 4, Credit 4 (offered twice a year)**

**0507-471** **Britain: 1800-Present**  
This course surveys the important events that formed British society, culture and politics from 1800 to the recent past. Topics range from the accomplishments of the Victorian era, popular monarchy, the emergence of mass democracy and the progressive democratization of the British political system to colonialism, art, literature, religion, the experience of two world wars, decolonization and Britain's belated role in the European Union. This course will be valuable to students interested in British history, politics or society and any students visiting the U.K. This course is part of the history concentration and the modern world history minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0507-485** **Foundations of Asian Civilization**  
A study of the Confucian/Buddhist world in East Asia, focusing on China and Japan, their origins and cultural characteristics. Part of the Chinese language/culture and history concentrations; the Japanese language/culture concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0507-486** **20th Century China and Japan**  
An examination of social, political, economic and intellectual developments of China and Japan in the 20th century with an analysis of how these two Asian powers have reached their respective significant status in the contemporary world. Part of the history and Chinese language/culture concentrations; the Japanese language/culture concentration and minor; the history of the modern world minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0507-487** **Communist China**  
An analysis of the main characteristics of Chinese Communism, its native roots, Marxist/Leninist elements and Maoist innovations. Also examines the causes for the rise of communism in modern China, the context and process of its development, as well as contributions and problems communism brought to the Chinese people. In addition, China and the world are examined. Part of the Chinese language/culture and history concentrations; the history of the modern world minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0507-488** **Modern Germany**  
A study of Germany in the 19th and 20th centuries, beginning with the unification of Germany in 1871 and tracing the political evolution of the nation to the present. Special emphasis is placed on the rise of Nazism. Pertinent social and cultural factors are considered as well. Part of the history, international relations and German language/culture concentrations; the European history, German language/culture, history of the modern world, and international relations minors; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0507-489** **Japan in the Modern World**  
An examination of social, economic, political and intellectual developments of Japan in the 19th and 20th centuries with an analysis of how Japan has achieved such significant status in the contemporary world. Part of the history and Japanese language/culture concentrations; the history of the modern world and Japanese language/culture minors; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0507-490** **History of Mexico**  
The historical development of Mexico, including the colonial period, independence movement, the liberal-conservative class and the revolution of 1910. Part of the history and Latino/Latina/Latin American concentrations; the Spanish language/culture concentration and minor; the history of the modern world minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0507-496** **African History**  
Provides an overview of African history and politics in three phases: pre-colonial times, colonialism and the postcolonial era. Part of the history, global studies and minority relations concentrations; the history of the modern world minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0507-497** **Biography in/as History**  
This course will consider the role of the individual in history, examining the lives of many Americans throughout the course of our history. Its scope will be comprehensive and not limited to only prominent Americans or those whose lives have had political significance. Course readings will cover many individual lives during different periods of United States history. Major historical biographies will be part of the assigned course readings. There will be an opportunity for students to select and read about a specific individual in American history in whom they have an interest. **Class 4, Credit 4 (offered occasionally)**

**0507-498** **Modern France**  
This course surveys the important events that formed French society, culture and politics from 1789, the outbreak of the Revolution, to the present. Topics range from the legacy of the Revolution and the cascade of short-lived regimes begun in 1799, 1815, 1830, 1848, 1852 and 1870 to urban planning, colonialism, art, literature, religion and the experience of three German invasions. This course will be valuable to students interested in French history, language, politics or society or any student who plans to visit France. Reading knowledge of French is not required. Part of the history and French language/culture concentrations; the history of the modern world and European history minors; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

## Science, Technology and Society

**0508-211** **Science, Technology and Values**  
This course explores the concepts and effects of science and technology in society, analyzes the relationship between science and technology, examines how each has come to play a major role today, and looks at how science and technology have affected and been affected by our values. This course also considers the environmental aspects of science and technology. Science and technology are often assumed to be value free, yet people, guided by individual and societal values, develop the science and technology. In turn, the choices people make among the opportunities provided by science and technology are guided by their individual values. This course fulfills a humanities core requirement. **Class 4, Credit 4 (offered quarterly)**

**0508-212** **Introduction to Environmental Studies**  
This course explores the human condition within an environmental context by emphasizing critical environmental problems facing humans on both a global and regional scale. The approach will be interdisciplinary. The issues, their causes and potential solutions will be analyzed with respect to ethical, social, historical, political, scientific and technological factors. This course fulfills a humanities core requirement. **Class 4, Credit 4 (offered quarterly)**

**0508-325** **Honors Science, Technology and Society**  
Like Science, Technology and Values, this course will explore value issues relating to science and technology. It will also consider the societal and environmental aspects of science and technology. The main difference is that this course will focus on a specific theme or topic that may emphasize science and values, technology and values or the environmental aspects of science or technology. The theme or topic will be chosen by the instructor, announced in the subtitle and developed in the course syllabus. This course fulfills a humanities core requirement. **Class 4, Credit 4 (offered occasionally)**

**0508-440** **History of Science**  
An introduction to the historical study of science, emphasizing the origins, character and development of Western science and its social, economic, cultural and religious contexts. The course features the physical sciences, with secondary coverage of the life sciences. Part of the science and technology studies concentration; the science, technology, and environmental studies minor; the historical perspectives on science and technology minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0508-441** **Science and Technology Policy**  
Examines how local, state, federal and international policies are developed to influence innovation, the transfer of technology and industrial productivity in the United States and other selected nations. Part of the science and technology studies concentration; the science, technology and environmental studies minor; the public policy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0508-442** **History of American Technology**  
An introduction to the historical study of technology in America. This course examines major periods and persons, ideas and inventions, and important events in American technological history. It also examines the cultural context of American technology and its influence on American social, economic, political and cultural institutions. Part of the science and technology studies concentration; the science, technology and environmental studies minor; the historical perspectives on science and technology minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0508-443** **Face of the Land**  
A case study in the relationship of technology and society, focusing on the interaction of land, people and technology. By considering the natural landforms of the United States and other countries as appropriate, the students see how the nature of land determines its value. As technological innovations are made and introduced, old relationships with the land are altered, sometimes irreversibly. Through this study students have a concrete example of the positive and negative effects of technology on the social structure. Part of the science and technology studies concentration; the science, technology and environmental studies minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0508-444** **Social Consequences of Technology**  
Modern society is increasingly based on technology. With each advance due to technology, unanticipated problems are also introduced. Society must define and solve these problems or the advances may be diluted or lost. In this course we study several interactions between technology and the world in which we live. We investigate how various technologies developed and compare the expected effects of the new technologies with the actual results. Part of the science and technology studies concentration; the science, technology and environmental studies minor; may also be taken as an elective. **Class 4, Credit 4**

**0508-445** **Biomedical Issues: Science and Technology**  
A study of the impact of science and technology on life, our view of life and of the value issues that arise from this impact. Part of the science and technology studies concentration; the science, technology and environmental studies minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0508-446** **Makers of Modern Science**  
Approaches the history of science through studying biographies of modern scientists. Modern science is understood to be science from the Scientific Revolution of the 16th and 17th centuries to the present. Emphasis will be on recent scholarship devoted to analyzing science in context; i.e., the way it actually develops through the lives of individuals in particular social and political contexts. Part of the science and technology studies concentration; the science, technology and environmental studies minor; the historical perspectives on science and technology minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0508-447** **Special Topics in Science and Technology**  
Allows for examination of a special problem or topical area in the field of science and technology studies. Topics and specific content and methods vary from year to year or term to term. Part of the science and technology studies concentration; the science, technology and environmental studies minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0508-449** **History of Women in Science and Engineering**  
Using biographical and social-historical approaches, this course examines the history of women's involvement in science and engineering since the birth of modern science in the 17th century; the historical roots of gender bias in the Western scientific enterprise; and the influx of women into science and engineering since the mid- to late-20th century. Part of the science and technology studies concentration; the science, technology and environmental studies minor; the historical perspectives on science and technology minor; may also be taken as an elective. Cross-listed with women's and gender studies 0522-449. **Class 4, Credit 4 (offered occasionally)**

**0508-450** **History of Chemistry**  
This course surveys the history of chemistry from antiquity to the present. Emphasis will be on developments since the Renaissance; on changing views of how matter is structured and how different substances react (or fail to react); and on the political, social and cultural contexts that influenced the rise of new chemical concepts and practices. Part of the science and technology studies concentration; the science, technology and environmental studies minor; the historical perspectives on science and technology minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0508-451** **Cyborg Theory: (Re)thinking the Human Experience in the 21st Century**  
The developing cybernetic organism, or "cyborg," challenges traditional concepts of what it means to be human. Today medical science and science fiction appear to merge in ways unimagined a century ago. By exploring scientific and cultural theories, science fiction and public experience, this class examines the history and potential of the cyborg in Western cultures. Part of the science and technology studies concentration; the science, technology and environmental studies minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0508-452** **Gender, Science and Technology**  
This course explores the importance of gender within Western science and technology. It considers how masculine and feminine identities are socially and culturally shaped, how sex and gender are being significantly transformed, and how rethinking gendered practices may help make science and technology fairer and more responsive. Part of the science and technology studies concentration; the science, technology and environmental studies minor; may also be taken as an elective. Cross-listed with women's and gender studies. (0522-450) **Class 4, Credit 4 (offered annually)**

**0508-460** **Environment and Society**  
This course introduces the interdisciplinary foundations of environmental science via an analysis of sustainability. It will consist of one lecture and one lab per week. Labs will emphasize non-classroom-based learning activities such as field trips. Initial course for the environmental science degree program. Part of the environmental studies concentration; the science, technology and environmental studies minor; may also be taken as an elective. Part of the environmental studies minor. **Class 2, Lab 4, Credit 4 (F, S) (offered twice annually)**

**0508-463** **Great Lakes I**  
The first course in a two-quarter sequence that approaches the Great Lakes ecosystem using the interrelated, interdisciplinary principles of environmental science. Throughout the sequence, the focus will be on sustainability as the foundation for environmental problem solving in the Great Lakes. The sequence will assess environmental issues involving the Great Lakes in the context of our local community as well as in regional and global contexts. Within the matrix of scientific principles, students will consider the importance of government action, political science theory, public policy, ethics, economics, sociology, history and engineering. The course will include a combination of classroom and field activities. Part of the environmental studies concentration; the science, technology, and environmental studies minor; may also be taken as an elective. Part of the environmental studies minor. **Class 2, Lab 4, Credit 4 (offered annually)**

**0508-464** **Great Lakes II**  
The second course in a two-quarter sequence that approaches the Great Lakes ecosystem using the interrelated, interdisciplinary principles of environmental science. Throughout the sequence, the focus will be on sustainability as the foundation for environmental problem solving in the Great Lakes. The sequence will assess environmental issues involving the Great Lakes in the context of our local community as well as in regional and global contexts. Within the matrix of scientific principles, students will consider the importance of government action, political science theory, public policy, ethics, economics, sociology, history and engineering. The course will include a combination of classroom and field activities. Part of the environmental studies concentration; the science, technology, and environmental studies minor; may also be taken as an elective. Part of the environmental studies minor. (0508-463) **Class 2, Lab 4, Credit 4 (offered annually)**

**0508-482** **Energy and the Environment**  
This course will examine contemporary energy issues with particular emphasis on the environmental implications associated with energy consumption and production. Students will learn about various energy technologies and fuels (including nuclear, coal, oil, natural gas, solar, biomass and wind) and the environmental tradeoffs associated with each of these energy systems. Part of the environmental studies concentration; the science, technology and environmental studies minor; may also be taken as an elective. Part of the environmental studies minor. **Class 4, Credit 4 (offered annually)**

**0508-483** **Environmental Values**  
This course identifies, interprets and traces the values associated with environmental concerns and the factors that induce change in those values. Part of the environmental studies concentration; the science, technology and environmental studies minor; may also be taken as an elective. Part of the environmental studies minor. **Class 4, Credit 4 (offered annually)**



**0508-484 Environmental Policy**  
This course introduces students to the environmental policy-making process. Students identify the consequences of major environmental legislation and regulations and examine the actions of both citizens and the corporate sector as they comply with these laws. They also focus on the economic and social implications and value of environmental regulation and enforcement and identify current developments in the area. Part of the environmental studies concentration; the science, technology and environmental studies minor; the public policy and American politics concentrations and minors; may also be taken as an elective. Part of the environmental studies minor. Part of the legal studies minor. **Class 4, Credit 4 (offered annually)**

**0508-487 Special Topics in Environmental Studies**  
Allows for examination of a special problem or topic in the field of environmental studies. Topics and specific content and methods vary from year to year or term to term. Part of the environmental studies concentration; the science, technology and environmental studies minor; may also be taken as an elective. Part of the environmental studies minor. **Class 4, Credit 4 (offered occasionally)**

**0508-488 History of Ecology and Environmentalism**  
This course explores the history of ecological science from the 18th century to the present and features the political use of ecological ideas in environmental debates from the 19th century to the present. We investigate how social and political ideas have influenced ecological science, how ecological concepts have influenced Western politics and society, and how different generations of ecological researchers have viewed their role in society. Part of the environmental studies concentration; the science, technology and environmental studies minor; the historical perspectives on science and technology minor; may also be taken as an elective. Part of the environmental studies minor. **Class 4, Credit 4 (offered occasionally)**

**0508-489 History of the Environmental Sciences**  
This course surveys the history of the environmental sciences from antiquity to the present. The environmental sciences include those sciences that deal with the Earth's physical and organic environments, ranging from geology and biology to evolutionary theory and ecology. A prominent theme is the influence of social, religious and political ideas on theories of how the Earth and its plants and animals have evolved. Part of the environmental studies concentration; the science, technology and environmental studies minor; the historical perspectives on science and technology minor; may also be taken as an elective. Part of the environmental studies minor. **Class 4, Credit 4 (offered occasionally)**

**0508-490 Biodiversity and Society**  
This course explores the problems, issues and values stemming from the current massive loss of biodiversity. This course also explores why preserving or conserving biodiversity is considered to be important and what mechanisms have been identified for its maintenance. Part of the environmental studies concentration; the science, technology and environmental studies minor; may also be taken as an elective. Part of the environmental studies minor. **Class 4, Credit 4 (offered biannually)**

**0508-491 Sustainable Communities**  
This course uses the concept of sustainability to explore the connections between natural and human communities; between nature and culture; and among environmental, economic and social systems. The course also encourages learning outside the classroom. In the context of neighborhoods in the city of Rochester, students will observe firsthand the contemporary issues associated with urban communities that are seeking to achieve sustainability. Part of the environmental studies concentration and minor; the science technology and environmental studies minor; may also be taken as an elective. No prerequisite. **Class 4, Credit 4 (offered occasionally)**

**0508-500 Science, Technology and Society Classics**  
Classic science or technology books have notable social significance. In this course students will read several such books to advance their understanding of how society learns about, explores and evaluates science and technology. The seminar format for this course will also advance students' writing, speaking and research skills. May be counted as an arts of expression course or may be counted as part of the science and technology studies concentration; the environmental studies concentration; or the science, technology and environmental studies minor; may also be taken as an elective. No prerequisite. **Class 4, Credit 4 (offered annually)**

**0508-520 Seminar: Historical Perspectives on Science and Technology**  
This is an upper-level undergraduate seminar that explores how recent generations of historians have studied, interpreted and debated the development and influence of science and technology. Each offering of the seminar will focus on a particular topic or historical era. Students will read pivotal texts with the goal of discussing the quality of the research and trends in historical interpretation. Required for the historical perspectives on science and technology minor. Part of the science and technology studies and environmental studies concentrations; the science, technology and environmental studies minor; may also be taken as an elective. (Any two of the designated history of science or technology courses) **Class 4, Credit 4 (offered occasionally)**

**0508-540 Science and Technology Policy Seminar**  
Students in the course will apply the skills, concepts and methods they learned in a prerequisite course to a contemporary science and technology policy topic. Topics may vary from year to year or term to term. Part of the science and technology studies, environmental studies, and public policy concentrations; the science, technology and environmental studies and public policy minors; may also be taken as an elective. (0508-441, 0508-484, or 0521-400) **Class 4, Credit 4 (offered occasionally)**

**0508-570 Environmental Studies Seminar**  
This course is an upper-level undergraduate seminar that explores a specific, in-depth environmental issue, problem or topic from multidisciplinary perspectives. Students will read pivotal texts appropriate to the topic with the goal of formulating feasible and appropriate responses. Experiential learning activities such as field trips may also be included. Part of the environmental studies concentration and minor; the science and technology concentration; the science and technology and environmental studies minor; also may be taken as an elective. (Any two of the 0508 environmental studies courses approved by the department) **Class, Credit 4 (offered annually)**

## Philosophy

**0509-210 Introduction to Philosophy**  
An introduction to some of the major problems, methods and insights of philosophy with readings from both classical and contemporary sources. **Class 4, Credit 4 (offered quarterly)**

**0509-211 Introduction to Ethics**  
This course is an introduction to central questions of ethics. Some of the questions that are examined are these: What are the grounds for moral obligations like keeping promises or obeying the law? Is there a place for moral values in a world of facts? How is human nature related to morality? How do we reason about what to do? Can reason determine how we ought to live? What are moral judgments? Is there an ultimate moral principle? Are there universal goods? What constitutes a morally worthwhile life? Can morality itself be challenged? **Class 4, Credit 4 (offered quarterly)**

**0509-213 Critical Thinking**  
An introduction to philosophical analysis, especially as it may be applied in contexts other than professional philosophy. **Class 4, Credit 4 (offered quarterly)**

**0509-217 Ethics in the Information Age**  
Technological advances in creating, storing, sending and monitoring information have created new ways in which ethical problems can arise. We explore ethical issues such as privacy, the commodification of data, hacking, ownership of images and Web pages, and the status of the Web as a public good or corporate creation. A wide variety of ethical issues is introduced, and students begin to learn how to fashion solutions both for private ethical problems and matters of public interest. **Class 4, Credit 4 (offered quarterly)**

**0509-440 Philosophy of Religion**  
This course will critically examine definitions, assumptions and arguments central to religion. Topics may include interpreting the nature of religion, arguments for and against the existence of God, the relation between theology and philosophy, the relation between God and the world, paganism, the problem of evil and the nature of religious language and experience. Part of the religious studies concentration, the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

**0509-441 Logic**  
An introduction to the basic principles of logic. The main emphasis is on symbolic or formal logic, but some attention may be paid to informal logic as well. Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

- 0509-442** **Philosophy of Art/Aesthetics**  
Introduces students to thinking philosophically about the nature of art and its relation to other human experiences. Among the topics considered are the aesthetic experience, the relation between morality and art, ugliness in art and truth in art. Part of the philosophy concentration and minor; may also be taken as an elective. (One philosophy course or consent of instructor is strongly encouraged.) **Class 4, Credit 4 (offered at least once every two years)**
- 0509-443** **Philosophy of Science**  
An examination of the nature of the scientific enterprise; possible discussion topics include the presuppositions of science, its logic, its claims to reliability, and its relationships to society and to problems of human values. Part of the science and technology studies concentration; the science, technology and environmental studies minor; the philosophy concentration and minor; may also be taken as an elective. (At least one prior course in either philosophy or one of the natural sciences: physics, chemistry, biology) **Class 4, Credit 4 (offered at least once every two years)**
- 0509-444** **The Great Thinkers**  
An examination of the thought of some of those philosophers who have been most influential in the history of ideas. An attempt is made to cover in some depth the works of one or more of those "great thinkers." The student will begin to recognize the enduring nature of some of our most pressing problems as well as the intellectual foundation of proposed solutions. For more information on this and other philosophy courses, please see <http://www.rit.edu/philosophy>. Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**.
- 0509-445** **Social and Political Philosophy**  
An examination of some of the main problems of social and political philosophy through an analysis, comparison and critical examination of various views concerning the natures of individuality and society and the relations between them. Part of the peace studies concentration; the philosophy concentration and minor; may also be taken as an elective. (At least one prior course in philosophy, political science or sociology) **Class 4, Credit 4 (offered at least once every two years)**
- 0509-446** **Philosophy of Law**  
An introduction to philosophical analysis centering on the nature, extent and justification of law, the nature of legal thought, and the problems and theories of justice. Part of the peace studies concentration; the philosophy concentration and minor; may also be taken as an elective. Part of the legal studies minor. **Class 4, Credit 4 (offered at least once every two years)**
- 0509-447** **Contemporary Moral Problems**  
This course examines ethical questions that arise in the course of day-to-day individual and social life. While some consideration will be given to ethical theory and its application to such questions, emphasis will be on practical issues. Examples of typical questions to be examined are capital punishment, euthanasia, abortion, the treatment of animals, corporate responsibility and so forth. Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**
- 0509-448** **Philosophy of Peace**  
An introduction to some of the philosophical dimensions of the search for world peace, including the elements that would constitute a just and lasting peace, nations as moral entities, justice and national self-interest, force and violence, the morality of the use of force, peace-making and peace-keeping groups. Part of the peace studies concentration; the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**
- 0509-449** **Special Topics**  
A critical examination of issues in some area of philosophy not covered in other philosophy courses. For more information on this and other philosophy courses, please see <http://www.rit.edu/philosophy>. Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**
- 0509-450** **Seminar in Philosophy**  
Examines some area of philosophy at an advanced undergraduate level. The area examined may vary from quarter to quarter. The seminar is designed especially for those whose interest in philosophy goes beyond the requirements of the liberal arts curriculum. For more information on this and other philosophy courses, please see <http://www.rit.edu/philosophy>. Part of the philosophy concentration and minor; may also be taken as an elective. (Two courses in philosophy or permission of the instructor) **Class 4, Credit 4 (offered annually)**
- 0509-451** **Professional Ethics**  
This course critically examines ethical issues that arise in professional life. The course will examine not only the general relationship between ethics and professional life but the particular consequences of ethical considerations within the student's own profession and the professions of others with whom the student must live and work. Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**
- 0509-452** **Philosophy of Technology**  
Technology is a ubiquitous and defining force in our world. The course investigates how our conceptions of technology have emerged within philosophy as well as the role technology plays in shaping how we live and how we reflect upon questions of meaning and value in life. Technological modes of understanding, organizing and transforming the world shape our relationships with others, with ourselves and with nature at fundamental levels. We will explore how these modes have emerged and why they emerged so predominantly within a Western social and intellectual context. Part of the public policy degree program; the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**
- 0509-453** **Environmental Philosophy**  
A variety of decision procedures may be and have been used to determine what to do regarding environmental issues. Each alternative can determine what is reasonable and moral, and assessing them presents theoretical problems. We examine each in terms of morality, examine their presuppositions and consequences, determine whether we can assess them and, if so, how. Students begin to learn to be conscious of and assess the decision procedures that are often buried in policy recommendations regarding particular environmental problems. Part of the public policy degree program; the philosophy concentration and minor; may also be taken as an elective. Part of the environmental studies minor. **Class 4, Credit 4 (offered at least once every two years)**
- 0509-454** **Feminist Theory**  
This course explores the nature and effects of categories of sex and gender upon our ways of living, thinking and doing, while also challenging how gendered assumptions might shape our conceptions of identity and inquiry more generally. Different conceptions of sex and gender will be discussed, and the course will investigate how these concepts affect our lives in both concrete and symbolic ways. Special attention will be paid to how gendered assumptions color our understanding of knowledge production, experiences of embodiment and emotion, public and private activities, and the nature of ethical decision making. Part of the philosophy concentration and minor; may also be taken as an elective. (One prior course in philosophy recommended) Cross-listed with women's and gender studies 0522-406. **Class 4, Credit 4 (offered at least once every two years)**
- 0509-455** **Theories of Knowledge**  
Epistemology, or the theory of knowledge, examines how we come to know what we know. This course covers historical and contemporary approaches to the question of what knowledge is, what makes a belief true, and how beliefs are justified. Philosophical skepticism, the position that we actually know nothing at all, will also be discussed, as will possible responses. Other topics may include feminist epistemology, naturalism, the internalism/externalism debate, and the application of epistemology to other fields. Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**
- 0509-456** **Ancient Philosophy**  
This course examines the origin and development of Western philosophy in ancient Greece from Thales in the 6th century down to at least the 4th century BCE, concentrating on the central ideas of the pre-Socratics, the Sophists, Socrates, Plato and Aristotle. Some attention might also be given to the Hellenistic philosophers (Epicureans, Stoics and Sceptics). Questions to be considered in this course will include: What are the nature and limits of knowledge? What is the nature of language? How reliable is perception? What is the true nature of reality? What is the origin and nature of the material world? What is the nature of happiness? Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

**0509-457** **Modern Philosophy**  
This course examines the history of modern philosophy from Descartes through Kant. This period marked the beginning of modern science, with a rich ferment of ideas, and the philosophy of the period is essential to understanding modern science as well as contemporary problems about consciousness, mind/body interaction, causation, and so on. Questions to be considered in this course include the following: What is the scope and what are the limits of our knowledge? What is the nature of reality? Do we have access to reality? How is causal interaction possible, if at all? Does God exist, and if so, how do we know and what relation does God have to the world? Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

**0509-458** **Philosophy of Mind**  
The philosophy of mind is a fairly large category. It includes issues of metaphysics, epistemology, logic, psychology, aesthetics, linguistics, cognitive science, artificial intelligence and biology, to name a few. Here are some typical questions that writers in the philosophy of mind often find interesting: Is there an ontological difference between minds and bodies? Could there be minds without bodies? Can I know that I have a mind? Are there other minds in the universe? Can I be conscious of my own consciousness? Can other things have the kinds of experiences which I have? Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

**0509-459** **Philosophy of Social Sciences**  
This course examines the methods, foundations, assumptions and purposes of the social sciences. In particular, it will examine the ways in which "science" and "non-science" are distinguished as well as the similarities and differences between the social and natural sciences. Special attention will be paid to the ways in which both Anglo-American and European philosophical traditions approach the social sciences. Other topics may include the role of values in social scientific inquiry, the process of explanation and theory confirmation in the social sciences, and various conceptions of interpretation and meaning in the social sciences. Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

**0509-460** **East Asian Philosophy**  
This course is an introduction to the origin and development of the philosophical traditions of primarily China and Japan through a consideration of selected thinkers, schools and classic texts of Daoism, Confucianism, Buddhism and Zen. Questions of metaphysics, epistemology and ethics are emphasized with reference to the nature of reality and the person, social harmony and self-realization, causality, right action and enlightenment. Comparisons may also be made with Western philosophers, both contemporary and classical. Part of the religious studies concentration; the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

**0509-461** **American Philosophy**  
This course examines the contributions of American philosophers from the colonial era to the present day. From the New England transcendentalists of the 19th century to the pragmatism and neo-pragmatism of the 20th and 21st, American philosophy has responded to the demands of a pluralistic, ever-changing society. Because American philosophy is a reflection of American culture, it has also offered a unique perspective on perennial philosophical problems in ways that have differed sharply from dominant forms of European philosophy. Authors may include Ralph Waldo Emerson, Henry David Thoreau, Frederick Douglass, Susan B. Anthony, C.S. Peirce, Jane Addams, William James, Black Elk, John Dewey and Richard Rorty. Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

**0509-462** **Contemporary Philosophy**  
This course examines developments in philosophy since 1900. During this time philosophy evolved along with science, politics and the arts. In some cases philosophy responded to new discoveries and theories while at other times it precipitated movements that had far-reaching effects. A range of philosophical approaches may be discussed, including postmodernism, positivism, critical theory, existentialism, feminist theory, neo-pragmatism and phenomenology. The connections among different approaches will also be addressed. Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

**0509-464** **Philosophy of Action**  
This course explores the three central philosophical issues of action theory: what is an action, what is an agent, and what is metaphysical freedom. The first part of the course examines the most significant theories of action and the different ways in which they characterize intentional behavior. The second part of this course explores the nature of agency. The third part of this course focuses on the classical problem of free will. Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

**0509-465** **Critical Theory**  
Introduces students to models of cultural critique that arose in pre-war Germany and that have burgeoned since. These models combine philosophical, aesthetic, economic and psychoanalytic methods of analysis. Among the topics considered are alienation and reification, hegemony or false consciousness, trauma, fetishism, the authoritarian personality and state, advertising and modern technology, and the relative autonomy of art. Part of the philosophy concentration and minor; may also be taken as an elective. (One previous course in philosophy or consent of instructor is strongly encouraged) **Class 4, Credit 4 (offered at least once every two years)**

**0509-466** **Existentialism**  
Existentialism is distinguished by its emphasis on human existence and the way its meaning is created through actions and choices. Existentialism focuses on the concept of individual freedom in an effort to respond authentically to the possibilities that life presents, emphasizing the importance of certain psychological states (e.g., anxiety, anticipation of death, fear, care, responsibility and hope) and extreme situations in bringing us to an awareness of our radical freedom. This course will consider such philosophers and writers as Dostoevski, Kierkegaard, Nietzsche, Berdyaev, Heidegger, Jaspers, Camus, Sartre, Kafka, Beauvoir, Marcel, Buber, Ortega, and Unamuno. Part of the philosophy concentration and minor; may be taken for the religious studies concentration with permission of coordinator, may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

**0509-467** **Medieval Philosophy**  
This course is an introduction to the philosophical thought during the medieval period (approx. 300 C.E. to 1500 C.E.). It will consider the thought of various major figures from the Christian, Jewish and Islamic traditions and will take up this period's two principal areas of concern: the philosophy of religion and theology, on the one hand, and metaphysics and epistemology, on the other. Part of the religious studies concentration; the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

**0509-468** **Metaphysics**  
Metaphysics is the study of the general features of existence or reality. This course focuses on the fundamental concepts of being as developed in several major philosophers from the Greeks to the present. Discussion will focus on such topics as God, time, space, substance, essence, existence, process, causality, possibility, necessity, chance and value. Part of the religious studies concentration; the philosophy concentration and minor; may also be taken as an elective. (One prior course in philosophy or permission of the instructor) **Class 4, Credit 4 (offered at least once every two years)**

**0509-469** **19th Century Philosophy**  
The 19th century marks a radical shift in the history of philosophy and culture and stands in its own right as a distinct period of thought between the modern era and the contemporary era. This course will consider such philosophical positions as idealism, empiricism, existentialistic romanticism, Marxism, evolution, nihilism, positivism, pragmatism, and the role of the arts and aesthetics. Philosophers considered include Schelling, Fichte, Hegel, Schopenhauer, Mill, Marx, Darwin, Kierkegaard, Nietzsche, Comte, Bradley, Green, Peirce and James. Part of the philosophy concentration and minor; may be taken for the religious studies concentration with permission of the coordinator; may be taken as an elective. (One prior course in philosophy or consent of the instructor) **Class 4, Credit 4 (offered at least once every two years)**

**0509-470** **Philosophy and Literary Theory**  
Introduces students to models of literary theory from the mid-20th century to the present and familiarizes them with the key works of literature to be analyzed. Prepares students to practice questioning and critiquing texts using the philosophical, aesthetic, economic and psychoanalytic methods of analysis that have come to form the foundation of contemporary literary theory. Among the topics considered are culture and imperialism, performativity, the encounter of modern literature and modern technology, structuralism and semiotics, the role of psychoanalysis, the role of the academy, and the relative autonomy of art. Part of the philosophy concentration and minor; may also be taken as an elective. (One course in philosophy or consent of instructor strongly encouraged) **Class 4, Credit 4 (offered at least once every two years)**

**0509-471** **Philosophy of Film**  
Introduces students to models of film interpretation and critique that arose in pre-war Europe and that have burgeoned since; these models combine philosophical, aesthetic, economic and psychoanalytic methods of analysis. Among the topics considered are the nature of the image, ideology and alienation, trauma, fetishism, magical realism, realism and anti-realism in film. Part of the philosophy concentration and minor; may also be taken as an elective. (One prior course in philosophy or consent of the instructor is strongly encouraged) **Class 4, Credit 4 (offered at least once every two years)**

**0509-472** **Minds and Machines**  
Present and potential technological developments in artificial intelligence and artificial life pose a variety of challenges to traditional accounts of intelligence, life and personhood. Is the mind a machine? Can machines think? Could artifacts deserve moral consideration? What would happen if machines evolved into the most intelligent and capable beings on the planet? Is it possible for “life” and “mind” to emerge out of a wholly material evolutionary process? This course will address these issues drawing from resources in the philosophy of mind and the philosophy of technology. Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

**0509-473** **Technology and Embodiment**  
This course investigates how technological practices and inventions can suggest new ideas for conceptualizing how the body works, what the body is fundamentally, and what the body can, as well as should, become. By critically examining different conceptions of embodiment as well as different technologies that mediate our embodied relation to the world, we will enrich our understanding of the nature and scope of agency and identity. Part of the philosophy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

**0509-474** **Philosophy of Language**  
This course examines how philosophers and others have understood the nature of language. It explores the classical philosophical contexts in metaphysics, epistemology, aesthetics and rhetoric in which concerns about the nature of language arose. In addition, the course focuses on recent debates within both contemporary analytic and continental traditions of philosophy. Some likely areas of inquiry will be: theories of reference, description and naming; theories of meaning, metaphor and narrative; functionalist, pragmatist and naturalist accounts; structuralist, post-structuralist and hermeneutic accounts, among others. The prominence of one or the other of these debates and approaches will vary. Part of the philosophy concentration and minor; may also be taken as an elective. (At least one prior course in philosophy is strongly recommended) **Class 4, Credit 4 (offered at least once every two years)**

**0509-475** **Philosophy of Vision and Imaging**  
This course examines how philosophers and others have understood the nature and primacy of sight. It explores how technologies of seeing and imaging have influenced theories of sight and our most dominant and authoritative practices of seeing and representing in the humanities and the arts as well as in the natural and social sciences. The course will focus on the impact these theories and practices of seeing and representing—both analog and digital—have on the nature of knowing as well as on how they shape and mediate our experiences of personal and social identity and agency more generally. Part of the philosophy concentration and minor; may also be taken as an elective. (At least one prior course in philosophy is strongly recommended) **Class 4, Credit 4 (offered at least once every two years)**

**0509-476** **Ethical Theory**  
This course examines the theoretical basis of ethics and morality, namely the theoretical commitments that enter into any judgment that a particular action is right or wrong. Possible topics may include: different ways of understanding the concepts of right and wrong; the existence or non-existence of moral facts; different criteria of moral actions; different conceptions of the good life. Part of the philosophy concentration and philosophy minor; may also be taken as an elective. **Class 4, Credit 4 (offered at least once every two years)**

**0509-571** **Honors: Philosophy**  
A critical examination of issues in some area of philosophy but specially geared for Honor students and others who wish to participate in an Honors section. Part of the philosophy concentration and minor; may also be taken as an elective. No prerequisite. **Class 4, Credit 4 (offered occasionally)**

## Anthropology

**0510-210** **Cultural Anthropology**  
This course explores how human beings across the globe live and work according to different values and beliefs. Students will develop the tools for acquiring knowledge, awareness and appreciation of cultural differences and in turn enhance their abilities to interact across cultures. The course accomplishes these aims by examining the relationship between individuals and their communities, and the dynamics of ritual, religious, political and social life in different parts of the world. Fulfills a liberal arts core social/behavioral science requirement. Counts as a prerequisite for the sociology/anthropology concentration and minor. **Class 4, Credit 4 (offered quarterly)**

**0510-325** **Honors Cultural Anthropology**  
Cultural anthropology is the study of cultural diversity and cultural change. Anthropologists use techniques of immersion to gain a close, insider’s view of a culture. Anthropological research addresses some of the most prominent and pressing social issues of our time, including international migration, mass media, changing views of gender and sexuality, racism, tourism, religious fundamentalism, ethnic nationalism, war and genocide, hunger and famine, and the globalization of popular culture. This course introduces cultural anthropology, and each year it may focus on a different topic. Fulfills a liberal arts core social/behavioral science requirement. Counts as the prerequisite for the sociology/anthropology concentration and minor. **Class 4, Credit 4 (offered occasionally)**

**0510-440** **Cultures in Globalization**  
Change in all subsystems of human culture is the norm on the planet Earth as its human inhabitants begin the 21st century and a new millennium. In particular, the stress and strain that accompany change challenge tradition lifeways among both tribal and peasant societies in the developing world. The change is driven by many factors, including global and local population growth and by the expanding world capitalist system through which technology is transferred and the culture of consumption is spread to the most remote corners of the globe. This course presents an anthropological perspective in which both historical and cross-cultural approaches to the study of cultural dynamics are emphasized. Required course for international studies majors. Part of the sociology/anthropology and Latino/Latina/Latin American concentrations; sociology/anthropology minor, may be taken as an elective. (0510-210, 0515-210 or equivalent) **Class 4, Credit 4 (offered annually)**

**0510-442** **Cultures of Latin America**  
Cancun and Kingston, Rio Bamba and Rio de Janeiro, San Juan and Santiago—this course introduces the cultures and societies of Latin America and the Spanish-speaking Caribbean. We review ancient indigenous cultures (Maya, Inca and Aztec) and ancient adaptations to the land. We examine Spanish and Portuguese colonialism and its consequences, including ethnic inequalities, economic vulnerability and social unrest. We look at the diversity of identities and how they are expressed creatively in dress, cuisine and art; religious diversity (from Santeria to Pentecostal Christianity); life in the countryside and the city; the changing roles of women and men, and how Latin American cultures are shaped by globalization but also maintain their distinctiveness. Part of the international studies degree program; the Latino/Latina/Latin American and sociology/anthropology concentrations; the Spanish language/culture concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0510-443** **Immigrants in the U.S.**  
This course considers cultural, social, economic and political issues concerning immigrants in the United States. We read and watch films about a variety of different immigrant groups, ranging from East Asian Indians in California to Arabs in Michigan, Sudanese in Minnesota, Brazilians in New York City, and Haitians in Florida. We look at the causes and historical patterns of migration and the kinds of jobs that immigrants have filled in the economy, everything from migrant farmworker to software engineer. We read about how immigrants adapt within the American cultural landscape; connections with the homeland; current debates in immigration law; and how immigration has changed since 9/11. Part of the sociology/anthropology concentration and minor; may also be taken as an elective. (0510-210, 0515-210 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0510-444** **Social Movements in Global Economy**  
Demonstrations in Seattle, Genoa, Seoul, Johannesburg, Mumbai, Porto Alegre and Cochabamba—economic globalization has given birth to global social movements. This course examines how global economic integration is brought about through multinational corporations, outsourcing, free-trade agreements, international lending and neoliberal economic reforms. We consider various impacts (cultural, economic, political, health and environmental) of these trends on employees, farmers, small businesses and consumers in the developed and developing worlds. Finally, we look at the beliefs and strategies of social movements that have mobilized workers, farmers, students, scientists, environmentalists and others into global coalitions. Part of Latino/Latina/Latin American concentration; the sociology/anthropology and Spanish language/culture concentrations and minors; may also be taken as an elective. (0510210, 0515-210 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0510-445** **Global Cities**  
This course surveys the impact of global dynamics on cities from the early 20th century to the present. By tracing urban formations from metropolis to global city, emphasis will be placed on the making of identities, communities and citizens in the architectural spaces, cultural places, ethnic zones and media traces of urban life in the context of globalization. Our focus includes global cities such as New York, Tokyo, London, Bombay, Hong Kong, Paris, Berlin, Istanbul, Shanghai and Cairo. Part of the sociology/anthropology concentration and minor; may also be taken as an elective. (0510-210, 0515-210 or equivalent) **Class 4, Credit 4 (offered annually)**

**0510-446** **Native North Americans**  
The resilience of Native North Americans continues to amaze anthropologists and those who once proclaimed them certain for extinction. What can now be acclaimed as a remarkable revival of dead Indians, these cultures are rich and thriving. They maintain their world views but in a drastically changed and contemporary setting. Many tribes own casinos, hotels, resorts and other successful businesses. Not only are the values and their heritage alive and well, they are quite successful in reviving the formerly outlawed traditions of the past such as potlatch, medicine lodge and ghost dance. This course is taught from a Native American perspective and addresses both past and current issues that affect their culture, heritage and tribal sovereignty. Part of the sociology/anthropology concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0510-447** **Anthropology of Mass Media**  
This course examines the cultural importance of mass media in different societies. By analyzing the flow of media images across national borders, emphasis is given to the local impact of media culture in different parts of the world. How, for example, do mass media represent and shape the cultural values and beliefs in developing societies? What is the role of mass media in forging national and ethnic identities, body images, sexuality and gender, and the experience of war and violence in Western and non-Western societies? Part of the sociology/anthropology concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0510-448** **Native North Americans in Film**  
From visions of romantic fantasy to imagery of the barbaric and horrific, Native Americans have been misrepresented in film since the invention of motion pictures. Tonto, Pocahontas, Hiawatha, and how the West was won—how do you know what is real and what is imagined? This course examines the genre of Native American films and intends to critically analyze stereotypes and false imagery and how these have infatuated even the most educated viewers. While anthropologists studied diligently among Native Americans, they too fed Hollywood the embellished images that dominate the big screen. We will identify the roles anthropologists have played in the emergence and correction of these Native American stereotypes. Part of the sociology/anthropology concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0510-449** **Sustainable Development**  
The international economic system (capitalist) has demonstrated extraordinary power in distributing goods to the farthest reaches of the globe. At the same time there is an increase in inequality and in the numbers of poor and hungry, often associated with environmental degradation. These changes are especially obvious in cities but are not limited to them. Since 1987, building on the work of the Brundtland Commission, there has been a concerted effort by the United Nations, by nongovernmental organizations, by individuals and by some nation states to explore paths of more sustainable development. This course explores varied strategies now employed to achieve sustainable development, with particular attention to less developed countries. Part of the sociology concentration and minor; may also be taken as an elective. Part of the environmental studies minor. **Class 4, Credit 4 (offered annually)**

**0510-450** **Cultural Resource Management and Historical Preservation**  
This course will introduce students to the objectives of CRM and historic preservation, the methods of designing research in the CRM/historic preservation context that will make contributions to our knowledge of the past. We will address the myriad considerations modern archaeologist and preservationists confront in their efforts to carry out archaeological research and historic preservation within a complex legal and ethical framework. Part of the sociology/anthropology concentration; may be taken as a liberal arts elective. (0510-210 or 0515-210) **Class 4, Credit 4 (offered annually)**

**0510-451** **Gender and Sexuality**  
This course explores issues of gender and sexuality in a global context. Students will be introduced to anthropological perspectives on the experience of men and women, as gendered subjects, in different societies and historical contexts, such as colonialism, nationalism, and global capitalism. In turn, we will explore how cultural constructions of masculinity and femininity are configured by race, class, ethnicity, and sexual orientation. Course materials are drawn from an array of sources, reflecting various theoretical perspectives and ethnographic views from different parts of the world. Part of the Sociology concentration and minor may be taken as a Liberal Arts elective. (0510-210 or 0515-210) **Class 4 Credit 4 (offered every other year)**

**0510-452** **Bodies and Culture**  
The body in culture, society and history. Comparative approaches to the cultural construction of bodies and the impact of ethnic, gender, racial differences on body practices (i.e., surgical alteration, mutilation, beautification, surrogacy, erotica). The formation of normative discourses of the body (regarding sexuality, AIDS/illness, reproduction, fat/food) in medical science, consumer culture and the mass media. The course will be discussion and project oriented, encouraging students to acquire a range of analytic skills through a combination of text interpretation and research. Part of the sociology concentration and minor; may be taken as a liberal arts elective. (0510-210 or 0515-210) **Class 4 Credit 4 (offered every other year)**

**0510-453** **Culture and Expression**  
The world's cultural diversity is most vividly and dynamically displayed through ritual, music, dance and festival. Through examination of performances in different cultures, this course examines performance as an expression of cultural beliefs, values and identity. Films and firsthand observations complement assigned readings. Topics include the relationship between the individual artist and culture, the transformative power of ritual, debates about tradition and authenticity, the politics of cultural performance and its impacts. Written expression is enhanced through drafting, revision, peer review and conferences with the instructor, while oral or signed expression is enhanced through in-class presentations. No prerequisite. May be used for arts of expression credit. Part of the sociology concentration and minor; may be used as an elective. **Class 4, Credit 4 (offered annually)**

**0510-454** **Visual Anthropology**  
We see others as we imagine them to be, in terms of our values, not as they see themselves. This course examines ways in which we can understand and represent the reality of others through visual media, across the boundaries of culture, gender and race. It considers how and why visual media can be used to represent or to distort the world around us. Part of the anthropology/sociology concentration and minor; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0510-457** **Divided Europe**  
As Europe strives for political and economic unity, we see a concurrent push toward inequality, exclusion and marginalization: minorities, immigrants, refugees, blacks, Muslims, Jews, gypsies and women struggle against discrimination. Not only the legacy of colonialism but the revitalization of nationalism shape contemporary European cultural politics. Based on an anthropological perspective, this course examines ways in which we can understand a divided Europe through the intersections of race, ethnicity, class, gender and religion. Course is an elective for international studies program; urban and community studies program; part of the sociology concentration and minor; may be taken as an elective. No prerequisite. **Class 4, Credit 4 (offered annually)**

**0510-483** **Anthropology of Religion**  
Religious expression, from the spiritualism of vodoun to the monotheism of Judaism and Islam, is the subject of this course. The course explores four religious dimensions—sacred speech, sacred acts, sacred beings and sacred places—through broad cross-cultural samples, including, among others, contemporary Haiti; the Cibecue Apache and Hopi of native North America; Pygmy, San and Azande of Africa; Bali in Indonesia; and Jewish and Islamic fundamentalism in southwest Asia. Religious practice is explored in holistic cultural content. Insights into religious practice are developed from the point of view of the practitioners and the outside observer. Part of the sociology/anthropology and religious studies concentrations; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0510-484** **Islamic Culture and the Middle East**  
This course introduces the fundamentals of the Middle East, with an emphasis on Islam, to students with little or no background in the region or the culture. The four themes to be addressed include: foundations of Islam; Islamic law and Islamic sects; material and performance culture in Islam; and Islamic culture and the West. The rationale for this course is to help students recognize and interpret fundamental concepts of other cultures, to encourage students' independent thinking about topical events within their historical perspective, and to inspire students to examine how their own cultures change and adapt to various students. May be taken as a general education requirement and is part of the sociology/anthropology concentration. No prerequisite. **Class 4, Credit 4 (offered annually)**

**0510-502** **Archaeology and the Human Past**  
Archaeology is the study of the human past, from the origin of our species through the development of modern, industrial states. In studying the past, archaeology seeks to explain how we, as modern humans came to be. This course discusses how archaeologists study the past and explain how human society has changed over time, and presents an overview of world prehistory. Specific topics will include the evolution of modern humans, the peopling of the world, the development of agriculture, the rise of states and the development of urban society. Case studies will be used throughout to demonstrate how archaeological research is conducted and how archaeologists use their research to formulate explanations of the past that have relevance for the present. Part of the sociology/anthropology concentration and minor. May also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0510-506** **Great Discoveries in Archaeology**  
Archaeology conjures a romantic image in the minds of many people, and almost everyone is familiar with at least some of the greatest discoveries made by archaeologists. Finds such as King Tut's tomb, the ancient city of Troy, the jungle cities of the Maya, and Otzi the Ice Man excite almost anyone who hears of them. But what is it, aside from fabulous wealth, romantic locale or incredible preservation that makes them great? Although great discoveries are always exciting, archaeology is not only about finding things but also about using these findings to explain the human past. This course helps us understand how and why human society has changed over time. It explores some of the great discoveries of archaeology, many of which will be familiar to students. Part of the sociology/anthropology concentration; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0510-507** **Archaeological Science**  
Archaeology is one of the few social sciences that lends itself well to the application of analytical techniques from the physical sciences. This is largely due to the fact that archaeology relies primarily on physical evidence. This course examines the growing field of archaeological science. The course covers a number of archaeological questions, including the age and origin of materials; how things are made; what people ate; their daily activities; their state of health; and how archaeological scientists are able to answer these questions using techniques from biology, chemistry and physics. The course includes in-class labs in which students apply some of these techniques and a final research project in which students pick their own archaeological question and methodology to answer it. Part of the sociology/anthropology concentration; may be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0510-508** **Archaeology of Cities**  
This course will focus on the pre-historical trajectories of urban development and the multiple roles of cities and their impact on the development of complex societies in different world regions. We will attempt to explain how, in its multiple forms and manifestations, the city has developed and contributed to the constitution of modern, industrial society. The course will consist of lectures, in-class discussions and activities, group presentations, and a final research paper that will be presented to the class. Part of the sociology concentration; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0510-509** **Survey of Metallurgy**  
This course introduces students to the anthropological study of metallurgy. The course begins with the survey of the earliest uses of metals and examines some of the early metallurgical treatises. Using archaeologically-derived and modern data, we will explore ancient and current mining and extraction techniques. We will also explore the meanings of metallurgical processes as presented in ethnographic accounts. Using information and data derived from scientific inquiry, archaeological excavations, and ethnographies, we will examine basic metal refining and working techniques. Students will also learn to interpret phase diagrams and study microstructures of metal samples. Part of the archaeology concentration. May be taken as an elective. Cross listed with 0531-444. **Class 4, Credit 4 (offered annually)**

**0510-510** **Field Methods in Archaeology**  
This course introduces students to the methods of archaeological field work. The course begins with the student's development of a research question and design. We then explore the feasibility of this research through the examination of sampling techniques, site survey, and excavation. Field methods of recording, photography and artifact conservation will also be discussed. Students will be able to analyze the usefulness of the field techniques in light of the archaeological scientific methods for dating, and organic and inorganic analyses. Students should emerge from the course understanding the values of the techniques necessary for proper archaeological excavation towards the reconstruction of the past and the development of an understanding of our present. Part of the archaeology concentration. May be taken as an elective. Cross listed with 0531-445. **Class 4, Credit 4 (offered annually)**

## Economics

**0511-200** **Foundational Seminar in Economics**  
This course is designed to introduce new students in the economics program (freshmen and external and internal transfers) to the applications of economic analysis in academic, business, government and the not-for-profit sector. Students will be exposed to the research and consulting activities undertaken by academic economists as well as a discussion of the career outcomes of the alumni of the RIT economics program. **Class 1, Credit 1 (offered annually)**

**0511-211** **Principles of Microeconomics**  
Microeconomics studies the workings of individual markets. That is, it examines the interaction of the demanders of goods and services with the suppliers of those goods and services. It explores how the behavior of consumers (demanders), the behavior of producers (suppliers) and the level of market competition influence market outcomes. **Class 4, Credit 4 (offered quarterly)**

**0511-325** **Honors Economics**  
This course introduces the student to some of the central concepts of economics. Potential topics include the division of labor, the marginal principle, utilitarianism, equilibrium determination, survey of market structures, welfare analysis, private and public goods, the role of government in the economy, opportunity cost and path dependency. The course concludes with a discussion of modern economic practice and the future of the profession. **Class 4, Credit 4 (offered occasionally)**

**0511-402** **Principles of Macroeconomics**  
Macroeconomics studies aggregate economic behavior. The course begins by presenting the production possibilities model. This is followed by a discussion of basic macroeconomic concepts, including inflation, unemployment and economic growth and fluctuations. The next topic is national income accounting, which is the measurement of macroeconomic variables. Following this the aggregate supply/aggregate demand framework is presented. The latter part of the course focuses on the development of one or more macroeconomic models, a discussion of the role of money in the macroeconomy and other topics the individual instructor may choose. (0511-211 or equivalent) **Class 4, Credit 4 (offered quarterly)**

- 0511-440** **Urban Economics**  
Urban economics is the application of economic analysis to spatial relationships in densely populated (urban) areas. The first part of the course develops economic models that explain the location behavior of consumers and businesses in cities. The second part is issue oriented, applying the insights gained in the first part to a number of urban problems. Part of the economics concentration and minor; may also be taken as an elective. (0511-211 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0511-441** **Economics of Human Resources**  
The microeconomic study of human resources encompasses aspects of human involvement in the production and distribution of goods and services. Potential topics are labor force participation, economics of employment discrimination, primary and secondary education, higher education, distribution of income and wealth, poverty and income maintenance, manpower planning, and microeconomic analysis of the work/leisure decision. Part of the economics concentration and minor; may also be taken as an elective. (0511-211 and 0511-402) **Class 4, Credit 4 (offered occasionally)**
- 0511-442** **Contemporary International Economic Problems**  
Prepares the student to deal with the foreign exchange market, international trade decisions, the macroeconomic effects of trade on domestic economics, and the effects of domestic business fluctuations on international trade and finance of each country. Though basically a theory course in economics, emphasizes the applied aspects of international trade and finance. Part of the economics concentration and minor; may also be taken as an elective. (0511-211 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0511-443** **Current American Macroeconomic Problems**  
An in-depth analysis of selected macroeconomic problems such as economic growth, inflation and business cycles. The primary focus is consideration of current macroeconomic theory and policy application in the context of the U.S. economic problems; e.g., tax-based incomes policies, wage-price controls. Part of the economics concentration and minor; may also be taken as an elective. (0511-211 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0511-444** **Public Finance**  
A study of the economics of the public sector. Topics include, but are not limited to, taxation and public expenditures and their effect on the allocation of resources, distribution of income, employment, market failure, public goods, the economics of public choice, and the application of public finance principles and normative questions to public economic issues. Part of the economics concentration and minor; may also be taken as an elective. (0511-211 and 0511-402) **Class 4, Credit 4 (offered occasionally)**
- 0511-445** **Survey of Economic Thought**  
A survey of the various schools of thought that have developed in economics from the late 18th century up to the present. Representative economists from each of the major schools (classical, Marxian, neo-classical, Keynesian, monetarist, etc.) are studied. Part of the economics concentration and minor; may also be taken as an elective. (0511-211 and 0511-402) **Class 4, Credit 4 (offered occasionally)**
- 0511-448** **Economics of Lesser Developed Countries**  
Introduction to the economic problems of less developed countries (LDC). Students study the historical causes of the underdevelopment gap between developed and underdeveloped countries and the theories and policies aimed at accelerating the rate of growth in LDC. In addition, the role of international organizations in the economic development of LDC is discussed. Part of the global studies concentration, the economics concentration and minor; may also be taken as an elective. (0511-211 and 0511-402) **Class 4, Credit 4 (offered occasionally)**
- 0511-450** **Benefit-Cost Analysis**  
Explores the use and abuse of benefit-cost and related analytical techniques commonly encountered in economic policy making. Many expenditure and regulatory programs of governmental agencies now are routinely evaluated in a benefit-cost or cost-effectiveness framework, and debate about policy decisions increasingly draws upon benefit-cost findings. Yet, application of benefit-cost analysis often attracts much controversy, in part because of disagreements about how to conduct such analysis and about the role that economic efficiency should play in societal decisions. The mechanics, power and limitations of this form of analysis form the primary elements of the course. Required course for economics majors; part of the economics concentration and minor; may also be taken as an elective. (0511- 211 and 0511-402) **Class 4, Credit 4 (offered annually)**
- 0511-452** **Monetary Analysis and Policy**  
The study of monetary behavior and the role of monetary institutions in the modern economy. Includes consideration of monetary theory, the development and current characteristics of monetary institutions in the American economy and the use of the tools of monetary analysis to evaluate alternative monetary policies. Concludes with an evaluation of the neo-Keynesian and monetarist positions. Required course for economics majors; part of the economics concentration and minor; may also be taken as an elective. (0511-211 and 0511-402) **Class 4, Credit 4 (offered annually)**
- 0511-453** **Intermediate Microeconomic Theory**  
Helps develop the tools of analysis utilized in contemporary economics to study the process of price formulation in a capitalist society. Topics include the theories of consumer behavior, cost and production, alternative market structures and the pricing of factors of production. Required course for economics majors; part of the economics concentration and minor; may also be taken as an elective. (0511-211 and 0511-402) **Class 4, Credit 4 (offered occasionally)**
- 0511-454** **International Trade and Finance**  
Introduces students to the theory and practical issues of the export/import markets, the international flow of capital and international investment decisions. In addition, students study the foreign-exchange and the Euro-dollar markets and the investment opportunities in them. The role of multinational corporations in international trade and finance also is discussed. Required course for economics majors; part of the economics concentration and minor; may also be taken as an elective. (0511-211 and 0511-402) **Class 4, Credit 4 (offered annually)**
- 0511-455** **Intermediate Macroeconomic Theory**  
The central question of macroeconomics is the determination of output, employment and prices. This course develops models that incorporate behavioral assumptions concerning consumption, investment and the role of money and their relationship to macroeconomic variables. Required course for economics majors; part of the economics concentration and minor; may also be taken as an elective. (0511-211 and 0511-402) **Class 4, Credit 4 (offered annually)**
- 0511-456** **Industrial Organization**  
The study of the structure, conduct and performance of contemporary American industry. Involves the application of the tools of microeconomic analysis and empirical evidence to aid in understanding the behavior of modern industry. In addition, the course considers the historical determinants of contemporary market structure and the public policy measures designed to preserve a competitive market structure. Required course for economics majors; part of the economics concentration and minor; may also be taken as an elective. (0511- 211 and 0511-402) **Class 4, Credit 4 (offered annually)**
- 0511-457** **Applied Econometrics**  
Provides students in the economics program with an opportunity to develop their skills in applied regression analysis. Covers the various regression models, estimation techniques, data preparation and transformation and the interpretation of regression results. Particular emphasis on the dangers of misuse of regression techniques. Required course for economics majors. Part of the economics concentration and minor; may also be taken as an elective. (0511-211 and 0511-402, 1016-226, 1016-319) **Class 4, Credit 4 (offered annually)**
- 0511-458** **Economic Forecasting**  
Introduction to one of the major functions contemporary economists perform—economic forecasting. Students are exposed to alternative theories and the manner in which economists in both the private and public sectors use these frameworks of analysis, data and quantitative methods to generate economic forecasts. Required course for economics majors. Part of the economics concentration and minor; may also be taken as an elective. (0511-211 and 0511-402, 1016-319, 1016-226) **Class 4, Credit 4 (offered annually)**
- 0511-459** **Managerial Economics**  
A further elaboration of the elementary principles of economic analysis in Principles I and II. Particular emphasis is on the application of these principles to the decision-making process of the firm. Required course for economics majors; part of the economics concentration and minor; may also be taken as an elective. (0511-211 and 0511-402) **Class 4, Credit 4 (offered annually)**

**0511-460** **Mathematical Methods: Economics**  
Develops the mathematical skills used by the applied economist in computer-based research. Exercises and research projects for the course are chosen to illustrate the kind of problems actually dealt with by the contemporary applied economist. Required course for economics majors; part of the economics concentration and minor; may also be taken as an elective. (0511-211, 0511-402, 1016-226 or equivalent) **Class 4, Credit 4 (offered annually)**

**0511-461** **Seminar in Applied Economics**  
A senior-level course emphasizing applications of economic analysis and quantitative methods to economic decision making. Cases are drawn from both private and public sectors of the economy. Required course for economics majors; part of the economics concentration and minor; may also be taken as an elective. (0511-211 and 0511-402) **Class 4, Credit 4 (offered occasionally)**

**0511-462** **Honors Independent Research**  
This course is designed to allow economics students who are in the Honors program to conduct their own independent research under the guidance of a faculty mentor. Prior to enrollment in this course, the student must submit a research proposal and the name of the proposed faculty mentor to the economics department for approval. Once approved, the faculty mentor in consultation with the student will determine the number of credit hours (1-4) that will be assigned for the course. The completed research project will be presented at the annual Liberal Arts Undergraduate Research Conference. **Class 4, Credit 4 (offered occasionally)**

**0511-463** **Directed Research in Economics**  
This course is designed to allow economics students to pursue research under the direction of an economics faculty member. Prior to enrollment in this course, the student must submit a research proposal to the proposed faculty sponsor and the economics department for approval. Once approved, the faculty sponsor in consultation with the student will determine the number of credit hours (1-4) that will be assigned for the course. The completed research project will be presented at the annual Liberal Arts Undergraduate Research Conference. **Class 4, Credit 4 (offered occasionally)**

**0511-464** **Game Theory with Economic Applications**  
Game theory uses a mathematical approach to study situations with two or more players in which each player's decision influences payoffs of other players. We will start with a short introduction on single-person decision theory and then study how to formulate multiperson decisions problems as game theoretic models; how to predict behavior (through the use of various equilibrium concepts—Nash equilibrium, Subgame Perfect Equilibrium, etc.) of the parties involved and/or identify guidelines for appropriate behavior. The concepts and methods will be illustrated with many examples from economics and business. Game theoretic methodology is widely used in economics, and hence the skills learned in this course will be very useful to both those who want to study further and those who plan to look for consulting jobs. Part of the economics concentration and minor; may also be taken as an elective. (0511- 211 and 0511-402) **Class 4, Credit 4 (offered annually)**

**0511-466** **Health Care Economics**  
This course examines the economics of health care and the organization of its delivery and financing and analyzes access to care issues; the role of insurance; the regulation of hospitals, physicians, and the drug industry; the role of technology, and limits on health care spending. (0511-211) Part of the economics concentration and minor; may be used as an elective. **Class 4, Credit 4 (offered annually)**

**0511-480** **Economic Role of Women**  
Analyzes the economic role of women in today's society. Includes the economic role of women in the labor force, as owners of other factors of production and in the business decision-making process. The impact of the changing role of women on GNP, labor market and other economic variables is elaborated. Through the analysis of some economic models and their application to real-world situations, it is shown that the social, political and individual equality of women depends, to a great extent, on their economic role in family and society. (0511-211 and 0511-402) **Class 4, Credit 4 (offered occasionally)**

**0511-481** **Environmental Economics**  
Examines the relationship and apparent conflict between economic growth and environmental quality, the economics of environmental issues and policy, the environment as a resource and a public good, and the ability and lack of ability of free markets and the government to deal adequately with pollution and other environmental problems. Part of the environmental studies concentration; the economics concentration and minor; the science, technology and environmental studies minor; may also be taken as an elective. Part of the environmental studies minor. (0511-211 and 0511-402) **Class 4, Credit 4 (offered occasionally)**

**0511-484** **Natural Resource Economics**  
This course develops an economic perspective on one of the most important and challenging issues facing global society—the allocation, use and preservation of natural resources. The course presents and discusses the methodology economists use to inform natural resource managers and policy makers. Economic thought and analysis are used to evaluate a variety of issues in this area. The course concludes with a brief discussion of the interdisciplinary aspects of natural resource management. Part of the economics concentration and minor; may also be taken as an elective. Part of the environmental studies minor. (0511-211 and 0511-402) **Class 4, Credit 4 (offered occasionally)**

**0511-571** **Honors Seminar in Economics**  
This course begins by introducing students to economics research methodologies and their constituent elements. Such elements include reviewing peer-reviewed research literature, developing economic models, posing economics research questions, deriving testable hypotheses, cultivating empirical evidence appropriate for testing the hypotheses, and writing the argument and results within the economics research paradigm. Students will present their research-in-progress during the seminar and will conclude the course by submitting a final paper. **Class 4, Credit 4 (offered occasionally)**

## Political Science

**0513-211** **American Politics**  
This course examines the basic principles, themes and institutions of American politics. We will approach the study of American politics through four interrelated topics: American political values and constitutional foundations; mass politics and political socialization; political institutions; and public policy. Current events will be discussed throughout the course in an effort to promote responsible citizenship. In addition to providing a basic overview of American politics, this liberal arts course seeks to develop critical thinking and group dynamic and communication skills that are transferable outside the classroom. **Class 4, Credit 4 (offered quarterly)**

**0513-214** **Introduction to International Relations**  
The purpose of this course is to provide basic knowledge of the field of international relations. Among the topics to be addressed are key theoretical concepts, themes and controversies in the field such as important state and non-state actors in international politics, security, economic relations between states, levels of analysis and schools of thought. **Class 4, Credit 4 (offered quarterly)**

**0513-215** **Political Ideologies**  
This course explores how political ideas and theories have shaped political practice, for good or bad. In particular, the course will concentrate on the most influential political ideologies that have shaped and influenced world politics. Topics to be considered include: democracy and modern liberalism, American liberalism, socialism and communism, fascism, liberation ideologies and the politics of identity of Islamism and zionism. **Class 4, Credit 4 (offered occasionally)**

**0513-325** **Honors Political Science**  
This course explores the founding principles of the American political order and their contemporary relevance. In addition, the course will examine the extent to which the three political institutions of American government (legislature, executive and judiciary) have either adhered to or departed from the founding principles. Emphasis will be on reading and analyzing primary sources from the founding era and some of the more influential perspectives on American government drawn from the Civil War period to the 20th century. **Class 4, Credit 4 (offered occasionally)**

**0513-401** **National Security Forces I**  
This course will examine American national security policy by analysis of the evolution of the American defense strategy and policy. Topics include methods for managing conflict, international terrorism, alliances and regional security, analysis of arms control and the threat of war, and the formulation of American defense policy and strategy, Air Force doctrine, and civilian control of the military. (Approval of the aerospace studies department, Air Force ROTC) Strictly for ROTC students. **Class 4, Credit 4**



**0513-402** **National Security Forces II**  
This course will examine the sociology aspects of officership and the military criminal justice system. Topics of interest focus on the military as a profession, officership, Air Force core values, and a comparison of the military/civilian justice system. (Approval of the aerospace studies department, Air Force ROTC) Strictly for ROTC students. **Class 4, Credit 4 (offered annually)**

**0513-441** **Politics in China**  
This course examines the following aspects of the People's Republic of China: Confucianism as traditional state ideology, political history of modern China, communist party, formal and informal governmental structures, economic modernization, political economy, and foreign policies. Part of the international relations and Chinese language/culture concentrations; the international relations minor; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0513-442** **Government and Politics of Russia**  
An analysis of the politics and governmental systems in Russia. Emphasis is on the dynamics of political, economic and social change as well as political leadership and contemporary issues. Part of the international relations concentration and minor; part of the Russian foreign language concentration; may be used as an elective. (0513 211, 215 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0513-443** **Politics of Russia and Newly Independent States**  
An examination of Russian domestic and international politics, with particular emphasis on the Big Bear's regional power status in the areas of the former Soviet Union. Political, economic, social and military influences on the development of surrounding countries will also be explored. Topics include democratization, organized crime, civil war, ethnic diaspora populations, and the struggle to establish capable states. Part of the international relations concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0513-444** **The Cold War and Beyond**  
A study of the relatively stable bipolar struggle between the United States and Soviet Union during the Cold War and the uncertain period that followed its abrupt end. Some of the questions that will be addressed are: Why did the Cold War start and end? How did the bipolar structure of the international system affect the foreign policies of the U.S. and U.S.S.R. as well as smaller nations? How does the Cold War continue to influence policy today? What type of system exists today and how does it affect state interaction? Part of the Russian language/culture concentration; the international relations concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0513-446** **Politics of Developing Countries**  
This course uses comparative theoretical perspectives to explore the ways in which the historical, cultural, economic and political context of the societies of Africa, Asia and Latin America determines the patterns of their political processes. Focus is directed to such factors as history, religion, economic underdevelopment and culture and their impact on the efforts to promote the values of liberalization and democratization, economic and social modernization and political and social stability. Part of the international relations concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0513-447** **Human Rights and Global Perspectives**  
This course explores the theoretical meaning, both domestically and internationally, and the institutional and political aspects of human rights. Issues covered include the definition of human rights; the relationship between civil and political rights and economic, social and cultural rights; the meaning and impact of humanitarian and international human rights law; the impact of cultural relativism in the definition and assessment of the promotion and protection of human rights; the significance of different religious perspectives; the question of the legitimacy of humanitarian interventions and the effects of globalization on human rights perceptions and practices. Part of the international relations concentration and minor; may also be taken as an elective. Part of the legal studies minor. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0513-449** **Special Topics in Political Science**  
Examines a political theme, issue or problem at an advanced undergraduate level. The subject matter examined will vary from year to year according to the availability of faculty and the interests of students. The course is designed especially for those whose interest in politics goes beyond the requirements of the liberal arts curriculum. The course may be taken as part of the American politics or international relations concentrations and minors and also as part of the political science minor. No prerequisite. **Class 4, Credit 4 (offered occasionally)**

**0513-450** **State and Local Politics**  
This course is a study of politics and government on the state and local levels and the relationships between these levels and the federal government. The course's major objective is to give the student a sophisticated understanding of these aspects of the political process. The first focus is on the federal system of government, including the interdependence of the three levels. The course continues by examining the state level and then local government. A final topic is policy making, including revenues and expenditures, which again illustrate the interrelationship of the three levels. Part of the American politics concentration and minor; may also be taken as an elective (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered annually)**

**0513-451** **The Legislative Process**  
Examines the role of the legislature in the U.S. political process. The primary emphasis is the study of the U.S. Congress, but some attention also is directed to state legislatures. Topics include elections, party organization, committees, interest-group activities and executive-legislative relations. Part of the American politics concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered annually)**

**0513-452** **The American Presidency**  
A study of the role of the presidency in the American political system. Among the topics considered are the nomination and election process; evolution, expansion and limitation of presidential powers; factors in decision making, and the various leadership functions performed by the American presidency. Part of the American politics concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered annually)**

**0513-453** **American Foreign Policy**  
A study of the formulation and execution of American foreign policy, including the examination of the instruments, procedures and philosophies shaping the development and implementation of foreign policy. Part of the international relations, American politics, global studies, ESL, and peace studies concentrations; the international relations, American politics, American history and European history minors; may also be taken as an elective. (0513 211, 214 or equivalent) **Class 4, Credit 4 (offered annually)**

**0513-454** **Political Parties and Voting**  
Political parties are a crucial part of the democratic process, as are elections. Parties and elections serve as a critical link between citizens and their government as parties and candidates promote policies favored by voters. This course studies parties, their history, their future and their role in the democratic process. Overall emphasis is on the degree to which parties perform or fail to perform as a link between citizens and government. Part of the American politics concentration and minor; may also be taken as an elective (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered annually)**

**0513-455** **Politics and Public Policy**  
A study of the politics of the policy process covering these basic questions: How do public problems get to the agenda of government? How does government formulate policy alternatives? How does government legitimate public policy? How does government implement public policy? How does government evaluate public policy? Part of the American politics and public policy concentrations and minors; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0513-456** **The Judicial Process**  
This course is the intersection between law and politics. We focus on the structure and functions of the Supreme Court of the United States within the federal courts system. Attention is devoted to justices as personalities, how they are recruited, how they influence each other, political forces that influence what they do, the manner in which they fulfill institutional roles and the social impact of their judicial decisions. Attention will be given to the emergence of the institutional identity of the court; the political struggles between the Supreme Court, lower courts, other governmental bodies, and the full range of political interests in the country. There will be an overview of how academic scholars view and explain decision-making by the Supreme Court. Part of the American politics concentration and minor; may also be taken as an elective. Part of the legal studies minor. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0513-457** **Constitutional Law**  
This course provides an introduction to Constitutional law by examining the Supreme Court's attempt to resolve constitutional disputes between the federal government and the states (federalism) and between the different branches of government (the separation of powers). The course will study carefully the text of the Constitution, the intention of the founders, and the interpretation of the Court in landmark cases that have defined American Constitutional Law. These cases will be studied both chronologically and thematically. Students will learn how to prepare a Langdellian brief in order to analyze the court's legal reasoning. In addition, the course will examine critically the proper extent of the judicial power in our democratic republic. Part of the American politics concentration and minor; may also be taken as an elective. Part of the legal studies minor. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered annually)**

**0513-458** **American Political Thought**  
Provides a general overview of the political ideas, concepts, issues and principles which taken together compose the stream of American political thought. Examines major controversies that have marked the developing body of the literature by examining the contributions of major political thinkers. Part of the American politics concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0513-460** **Constitutional Rights and Liberties**  
This course provides an introduction to the Supreme Court's legal and political reasoning on civil rights and liberties; that is, the fundamental individual rights of a free society contained in the Bill of Rights. Particular emphasis will be placed on the First Amendment as the cornerstone of a free society guaranteeing religious liberty and the right to free speech. The course will also examine how the Court has balanced constitutional rights and liberties in the First, Fourth, Fifth and Sixth amendments against the need for enhanced national security. Part of the American politics concentration and minor; may also be taken as an elective. Part of the legal studies minor. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered twice annually)**

**0513-461** **Introduction to Comparative Politics**  
The course provides a mode of analysis for the study of political systems. Basic concepts of political science are utilized to present a descriptive and analytical examination of various political systems that can be classified as liberal democracies, post-communist, newly industrializing countries (NICs), and third world. Particular attention is paid to the governmental structure, current leadership and major issues of public policy of those selected political systems under review. Part of the global studies concentrations; the international relations and American politics minors; the political science minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0513-462** **Abraham Lincoln and American Democracy**  
This course critically examines Lincoln's political thought and leadership as it has profoundly shaped, for better or worse, the character and development of American democracy. It will be structured thematically to provide a discussion of core aspects of Lincoln's thought and legacy on such issues as equality, slavery, race, the Union, leadership, ambition, constitutionalism, ambition and religion. The course will provide an overview to some of the major controversies concerning Lincoln's political thought, leadership and legacy. No prerequisite. Part of the American politics concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0513-463** **First Amendment, Liberty and Deliberate Democracy**  
This course will focus exclusively on the First Amendment and its relation to self-government. Special attention will be paid to the theory and practice of the principles of free speech, religious liberty, the free press, and the freedom to associate. A major effort throughout the course will be made to consider the nature of liberty and constitutional government. Part of the American politics concentration and minor; may also be used as an elective. Part of the legal studies minor. No prerequisite. **Class 4, Credit 4 (offered occasionally)**

**0513-464** **Law and Society**  
This course provides students with fundamental literacy about law as an immense and ubiquitous presence in society. It focuses on the relationships between law and other social institutions and examines the values and interests that are expressed in law and shaped by legal structures and processes. Consensus and conflict perspectives on the law are compared and contrasted and applied to understanding the law's impact on everyday life. This course takes an explicit interdisciplinary approach to understanding law. It is offered for those interested in critical inquiry of law within a framework of a broad liberal arts education. May be taken as an elective. No prerequisite. **Class 4, Credit 4 (offered occasionally)**

**0513-465** **Modern Constitutionalism, Liberty and Equality**  
This course examines the founding principles of modern constitutionalism and the modern state. Special attention will be paid to the theory and practice of the principles of equality, liberty, consent and popular sovereignty. A major effort throughout the course will be made to consider the assessments and prescriptions for modern constitutionalism offered by American and continental political thinkers. Part of the American politics concentration and minor; may also be used as an elective. Part of the legal studies minor. No prerequisite. **Class 4, Credit 4 (offered annually)**

**0513-466** **Political Leadership**  
The most fundamental proposition of this course is that political leadership makes a crucial difference in the life of a nation. It will examine such leadership, which may serve as either a constructive or destructive force in the pursuit of some shared, national goal or purpose. The course will consider a diverse range of leaders and their respective styles and types of leadership and their common traits, if any. The course may include five archetypes of political leadership and respective figures who embody these types. As a representative of a particular kind of political leadership, each leader will be studied in terms of his or her historical context, the principles for which he or she stood and the means and ends each employed in the pursuit of political goals. Part of the American politics concentration and minor; may be used as an elective. No prerequisite. **Class 4, Credit 4 (offered occasionally)**

**0513-481** **Women in Politics**  
A study of feminist thought as it applies to the political, economic and social status of women and how it has been expressed through the women's political movement. Students study a number of public policies as they apply to and affect women and examine the opportunities for women to participate in the political process. Part of the American politics concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) Cross-listed with women's and gender studies 0522-482. **Class 4, Credit 4 (offered occasionally)**

**0513-482** **African-American Politics**  
This course presents politics in America from perspectives of African Americans. The fundamental premise is that race is the most important cleavage in American life and that race has had an enduring fault line in American society and politics. This course will examine how the presence of Africans in the U.S. affected the founding of the republic and its political institutions from the colonial era to the present. The course will conclude with a comprehensive review of the race-related implications of the 2000 presidential election controversy in the state of Florida. Part of the American politics concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0513-484** **Government and Politics of Africa**  
The course examines the influence of historical, cultural, economic and social factors on the pattern of politics in sub-Saharan Africa. Focus is directed to the challenges of economic modernization and development; national integration; the promotion of a vibrant and liberal civil society; democratization and stability. Part of the international relations concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

- 0513-485** **Politics Through Fiction**  
This course explores contemporary issues facing the American and global political order through the lens of fiction. Particular attention will be paid to the grounds of sound political deliberation, the limitations of prudence and the theory and practice of American political principles both home and abroad. Part of the American politics concentration and minor; may also be taken as an elective. (0511-213, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0513-486** **Comparative Politics in Latin America**  
This course examines domestic and international challenges to the establishment of stable democracies in Latin America. The decades-long battle against narco-terrorism in Colombia, Marxist revolutionaries in Peru, widespread corruption at most levels of government throughout the region, and legacies of dictatorial military regimes all make Latin America a difficult place for democracy to take root. Compounding these problems are increasing environmental degradation in connection with rising global trade and massive economic debt to international lenders. Emphasis on civil-military relations, political institutions, social and international factors. Part of the Latino/Latina/Latin American concentration; the Spanish language/culture and international relations concentrations and minors; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0513-487** **International Law and Organization**  
The study of international law and organizations is the study of international cooperation and governance. We cover a variety of theoretical and substantive topics, including the theories of international law and organizations, the historical development of international organizations, how these organizations work in practice, and whether they are effective. We concentrate on the United Nations and the role and usefulness of nongovernmental organizations. Several of the substantive issues discussed are interstate violence and attempts to address humanitarian concerns, globalization and the environment. Part of the international relations concentration and minor; may also be taken as an elective. Part of the legal studies minor. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0513-488** **War and the State**  
Explores the enduring reality of war through an analysis of regional and global conflicts since the establishment of the modern international system. Key concepts include deterrence, appeasement, offensive-defensive military strategies and international balances of power. These will be applied to several historical cases to explain why wars occur and how they might be avoided. Part of the international relations concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0513-489** **Terrorism and Political Violence**  
This course examines the causes, methods and responses of non-state groups attempting to establish new political orders. The combined use of violence with the tactic of terror distinguishes these groups from others seeking political change. Special attention will be given to national and international efforts attempting to resolve such conflicts. Part of the international relations concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered annually)**
- 0513-490** **International Political Economy**  
Examines the interplay between states and markets and the interaction of the world economy and international politics. We study the nature of political economy, the major ideologies and approaches; specific topics include trade, investment, debt, and financial markets and the impact of globalization on the human condition and the environment. Part of the international relations concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0513-491** **The Middle East Peace Process**  
A study of the main approaches to conflict resolution through a focus on the Arab-Israeli peace process. The discussion will include theories of conflict and conflict resolution, peace studies, negotiation, the role of external powers and mediation. The course will explore the theoretical topics through a critical examination of the Israeli-Palestinian conflict, beginning with Jewish settlement in Ottoman Palestine in the 1880s to the present peace process. Part of the peace studies concentration; the international relations concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0513-492** **Religion and International Politics**  
Religion has been a common element in global politics. This course will address fundamental beliefs of various religions, the use of religion to explain or justify foreign policies, the role of evolving interpretations of texts to justify war or promote peace, and how religious leaders attempt to mitigate conflict and support justice. The course will analyze the historical and contemporary roles of religious beliefs and organizations with respect to war and peace, civil conflict, national identities, the legitimacy of governments, human rights, democracy, conflict management and conceptions of world order. Part of the international relations concentration and minor; may also be taken as an elective. (Introduction to International Relations 0513-214 and at least one upper-level international relations course are highly recommended as prerequisites) **Class 4, Credit 4 (offered occasionally)**
- 0513-493** **Global Politics and the Environment**  
Considers the relationship between political systems and the development of global environmentalism. International trade, colonial legacies, poverty and population growth will be examined in the context of national decision making and transnational influences. The course examines established democracies in the West and Japan, post-communist transitional countries in Eastern Europe, and developing countries in Asia and Africa. Topics include oil dependence, nuclear energy, alternative fuels, stratospheric ozone depletion, climate change, deforestation and species loss. Part of the international relations concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0513-494** **Comparative Public Policy**  
As modernization theorists predict, industrial and post-industrial societies tend to face similar public policy issues in such areas as public education, health care, public transportation, public housing and the protection and preservation of the environment. However, the political responses to these challenges have varied in significant ways in different states; many states have developed extensive welfare state systems while some have put more emphasis on market-based solutions. The course seeks to explore and analyze the factors that explain these differences and assess the extent to which the different approaches succeed in meeting these policy challenges. Part of the international relations concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0513-495** **Revolutions and Political Change**  
Revolutions aim to effect and often result in fundamental changes in a society's basic social, economic and political structures. They are also accompanied by violence, in some cases, civil war. Thus, they raise complex normative questions. The course provides students with a theoretical and historical understanding of three types of 20th century revolutions: classical, social and ideological (Russian, Chinese, Cuban, Iranian, Nicaraguan); anti-colonial (Vietnam, Algeria, Angola and Mozambique) and anti-communist (the Soviet Union and Eastern Europe). The course also involves assessments of the achievements and failures of revolutions in terms of their own goals as well as other normative values. Part of the international relations concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0513-496** **Government and Politics in East Asia**  
This course examines the East Asian countries using the following comparative criteria as the organizing guidelines: modern political history of the country, political economy and development, governance and policy making, representation and participation, major domestic and foreign policy issues. Prospects of the countries in the 21st century are analyzed and discussed. Part of the Chinese language/culture concentration; the Japanese language/culture and international relations concentrations and minors; may also be taken as an elective. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0513-514** **Political Theory**  
This course will examine the human quest for personal and political order. It will provide a critical introduction to some of the most influential and epic political thinkers who have shaped our world and whose profound legacy continues to do so today; for example, Plato, Machiavelli, Locke and Rousseau. The continuity and divergence between these political philosophers and their respective traditions will be examined throughout the course. Each political philosopher will be examined in terms of the enduring questions of cosmology, human nature, justice, the good society, politics, the state, democracy and legacy. Particular emphasis will be placed on exploring the relationship between education and politics. Part of the American politics concentration and minor; may also be taken as an elective. Part of the legal studies minor. (0513-211, 214 or equivalent) **Class 4, Credit 4 (offered annually)**

**0513-599** **Independent Study**  
A student may register for an independent study project subject to the approval of the faculty sponsor, student's department, the academic committee and the dean of the College of Liberal Arts and providing that she or he has a minimum GPA of 2.7 at time of application. An independent study project is not a substitute for a course. It enables the interested student and his or her faculty sponsor to coordinate their efforts on subjects and topics that range beyond the normal sequence of course selection. **Credit variable (offered occasionally)**

## Psychology

**0514-201** **Freshman Seminar**  
Acquaints students with career opportunities available to psychology majors, assists in exploration of individual career goals and aids students in planning a curriculum strategy that will match their goals. Required course for freshman psychology majors. **Class 1, Credit 1 (offered annually)**

**0514-210** **Introduction to Psychology**  
Introduction to the scope and methodology of psychology. Topics include aims, methods, neuroscience, sensation, perception, learning, memory, intelligence, motivation, normal and abnormal personality, and social psychology. Required course for psychology majors. **Class 4, Credit 4 (offered quarterly)**

**0514-315** **Scientific Writing**  
This is a course on how to write scientific articles. Basic grammar and style; structure of an empirical, theoretical, or review article; and Harvard and Vancouver citation formats will be covered. Students will learn by writing papers, by critiquing the papers of their peers and by taking exams. Required course for psychology degree program. Cannot be taken for liberal arts credit. (0514-210 or equivalent) **Class 4, Credit 4 (offered regularly)**

**0514-325** **Honors Psychology**  
A state-of-the-art survey of major subfields in psychology, the scientific study of behavior and mental processes. Topics include the biological basis of behavior, perception, learning, memory, intelligence, emotions, social relations, personality and psycho-pathology. Besides textbook reading, students will read and discuss current publications on each topic we explore. **Class 4, Credit 4 (offered occasionally)**

**0514-350** **Psychological Statistics**  
This course will cover descriptive and inferential statistics. Special attention will be given to psychological applications, conceptualization, interpretation of statistics, computer-assisted data analysis and reporting of results. This course should be taken prior to higher-level psychology courses, especially experimental psychology and track courses. Required course for psychology majors. (0510-210 or equivalent) **Class 4, Credit 4 (offered regularly)**

**0514-400** **Experimental Psychology**  
An introduction to the logic of experimental research and application of the scientific methods to the study of behavior. Emphasis on stating empirically testable hypotheses, designing and conducting experiments, and writing research papers in APA style. Required course for psychology majors. (0514-210, 350) **Class 4, Credit 4 (offered regularly)**

**0514-402** **Research Methods**  
An introduction to the logic of various research methods and the application of scientific methods to the study of behavior. Emphasis will be on a wide range of research designs and techniques, including surveys, correlational designs and quasi-experimental designs as well as true experimental designs. Students will learn to write research papers in APA style. Required course for psychology minors. (0514 210 or equivalent) **Class 4, Credit 4 (offered regularly)**

**0514-440** **Childhood and Adolescence**  
Explores human development from conception through adolescence. The developmental approach provides the opportunity to integrate many areas of psychological research such as cognition, personality, perception, social interaction and moral development as they apply to human development. Required course for psychology majors. Part of the psychology concentration and minor; may also be taken as an elective. (0514-210 or equivalent) **Class 4, Credit 4 (offered regularly)**

**0514-441** **Humanistic Psychology**  
Examines the major assumptions, theories and implications of "growth," or humanistic, psychology. Students study human beings as dynamic, complex creatures who shape themselves and their world through the choices they make each day and whose best hope for realizing their individual and collective potential is an accurate understanding of what humans need to grow psychologically and what societal conditions seem to foster such growth. Institute elective for psychology majors. Part of the psychology concentration; may also be taken as an elective. (0514-210 or equivalent) **Class 4, Credit 4 (offered regularly)**

**0514-442** **Adulthood and Aging**  
Encompasses the psychology of the span of life from young adulthood through the middle years. The developmental approach, presented in an interdisciplinary framework, provides a systematic orientation to the study of the individual during early adulthood. Institute elective for psychology majors. Part of the psychology concentration; may also be taken as an elective. (0514-210 or equivalent) **Class 4, Credit 4 (offered regularly)**

**0514-443** **Cognitive Psychology**  
This course examines how people perceive, learn, represent, remember and use information. Contemporary theory and research are surveyed in such areas as attention, pattern and object recognition, memory, knowledge representation, language acquisition and use, reasoning, decision making, problem solving, creativity and intelligence. Applications in artificial intelligence and human/technology interaction may also be treated. Part of the psychology concentration and minor; may also be taken as an elective. (0514-210 or equivalent) **Class 4, Credit 4 (offered regularly)**

**0514-444** **Social Psychology**  
Gives a general overview of those areas of social psychology currently under the most intensive investigation and likely to be of most interest to the student, including nonverbal communication, attraction aggression and group effects. Required course for psychology majors. Part of the psychology concentration and minor; may also be taken as an elective. (0514-210 or equivalent) **Class 4, Credit 4 (offered regularly)**

**0514-445** **Psychology of Perception**  
Covers topics of all sense modalities with emphasis on visual perception. Traces what happens to the physical stimulus as our sensory systems analyze it to produce complicated perceptions of the world around us; many complex perceptual phenomena draw upon explanations at the physiological, psychological and cognitive levels. Institute elective for psychology majors. Part of the psychology concentration and minor; may also be taken as an elective. (0514-210 or equivalent) **Class 4, Credit 4 (offered regularly)**

**0514-446** **Psychology of Personality**  
Examines the strengths and weaknesses of the major psychological theories of personality. Methods of assessing personality, research and applications of theory to real-life situations are included in the evaluation of each theory. Required course for psychology majors. Part of the psychology concentration and minor; may also be taken as an elective. (0514-210 or equivalent) **Class 4, Credit 4 (offered regularly)**

**0514-447** **Abnormal Psychology**  
Examines the major categories of mental disorder not only from the descriptive point of view but also in terms of the major theoretical explanations of the causes of disorder. The major treatment modalities also are covered. Required course for psychology majors. Part of the psychology concentration and minor; may also be taken as an elective. (0514-210 or equivalent) **Class 4, Credit 4 (offered regularly)**

**0514-448** **Industrial and Organizational Psychology**  
Consideration of principles as well as application of current research in industrial psychology, with particular reference to personnel selection, training, motivation, morale, performance appraisal, leadership and communication. Required course for psychology majors. Part of the psychology concentration and minor; may also be taken as an elective. (0514-210 or equivalent) **Class 4, Credit 4 (offered regularly)**

**0514-449** **Behavior Modification**  
Students learn the skills of changing their behavior by controlling their environment and the consequences of their behavior. Institute elective for psychology majors. Part of the psychology concentration and minor; may also be taken as an elective. (0514-210 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0514-451 Psychology of Motivation**  
Surveys basic motivational concepts and provides a fair representation of many different areas of motivational research, relating these to each other where possible. Institute elective for psychology majors. Part of the psychology concentration; may also be taken as an elective. (0514-210 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0514-453 Death and Dying**  
This course will view death from a social-psychological perspective. After dealing with topics such as the leading causes of death and attitudes toward death, suicide and American funeral practices, it will focus on such questions as how people can better cope with their own mortality and that of loved ones, can help others face death and help themselves and others during periods of bereavement. Part of the psychology concentration; may also be taken as an elective. (0514-210 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0514-480 Psychology of Women**  
Examines the relevance and applicability of present psychological theory and research to the understanding of the development and behavior of women. Major topics include psychological and biological sex differences, psychological theories of women's development, the relationship between female personality development and various sociocultural factors, women's place in society, women and their bodies, and women and mental health; may be taken as an elective. Cross-listed with womens and gender studies. (0514-210 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0514-483 Social Psychology of Religion**  
Examines religions as cultures that, like other "ways of life," face the task of attracting or creating new members, maintaining their loyalty, providing them with a coherent world view and satisfying their basic needs. Suggests how psychological processes such as identity information, attribution, self-actualization, brainwashing, conflict, denial, projection and repression may be applied and misapplied in efforts to understand religious belief and behavior. Part of the religious studies concentration; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0514-530 Attention and Spatial Vision**  
This is a course examining two specialized topics in psychology. We will cover various topics under the grand heading of spatial vision, including linear systems analysis (visually based), visual physiology, receptive field structure and responses, and perception of static patterns. We will also examine current psychological, physiological and neuropsychological research on attention. We will examine orienting, visual search, filtering and vigilance. Students will learn about a variety of topics related to current thinking about attention, our capacity for information processing, and how these relate to brain function. Research based on psychophysical studies, experimental psychology techniques and advance brain imaging methods will be covered. Required information processing/visual perception track course for psychology majors. Students may take this course for liberal arts or institute elective credit. (0514-210, 350) **Class 4, Credit 4 (offered occasionally)**

**0514-531 Language and Problem Solving**  
Perhaps the most significant cognitive capacity of human beings is their use and understanding of language. This course examines the structure of language and its relationship to thought and surveys contemporary theory and research on the comprehension and production of spoken and written language. Applications such as artificial speech recognition are discussed. The course also surveys the psychological literature on reasoning and problem solving and examines attempts in artificial intelligence to simulate human performance in these areas. Required information processing track course for psychology majors. Students may take this course for liberal arts or institute elective credit. (0514-210, 350, 400) **Class 4, Credit 4 (offered occasionally)**

**0514-532 Judgment and Decision Making**  
Explores judgment and decision-making processes and focuses on the social and cognitive aspects of complex information processing. Topics include selective perception, memory and hindsight biases, framing effects, heuristics and biases, social influences, group processes and common errors. Required information processing track course for psychology majors. Students may take this course for liberal arts or institute elective credit. (0514-210, 350, 400) **Class 4, Credit 4 (offered occasionally)**

**0514-533 Learning and Memory**  
This course reviews current research within a larger historical perspective. It presents the multistore or modal model of memory with an in-depth examination of the evidence used to support the model. It also includes topics such as memory structures, levels of processing, implicit and explicit memory, schemas, signal detection theory and global memory models. Theories of learning are clearly meaningful for the study of memory. With the new developments in connectionist models of learning, theories of learning again assume importance in scientific study. Required information processing track course for psychology majors. Students may take this course for liberal arts or institute elective credit. (0514-210, 350, 400) **Class 4, Credit 4 (offered occasionally)**

**0514-540 Visual System**  
As the basis to study visual perception, this course introduces electromagnetic waves as visual stimuli; structure of the eye; and visual pathways in humans, vertebrates and some non-vertebrates. The materials covered span basic optics, biology, physiology and psycho-physics. The functional and behavioral consequences of the visual system, such as uneven distribution of photoreceptors in the retina, receptive field of cells and neural plasticity, are also considered. Required for psychology majors in the visual perception track. Students may take this course for liberal arts or institute elective credit. (0514-210, 350, 400) **Class 4, Credit 4 (offered occasionally)**

**0514-541 Color Perception**  
Explores human color perception from the psychophysical perspective with knowledge in optics, neurophysiology and color science. Among the topics covered are theories of color vision, basic colorimetry, congenital and acquired color vision deficiencies and evolution of color vision. Required for psychology majors in the visual perception track. Students may take this course for liberal arts or institute elective credit. (0514-210, 350, 400) **Class 4, Credit 4 (offered occasionally)**

**0514-542 Spatial Vision and Pattern Perception**  
Traditional psychological views of organization of spatial vision such as Gestalt psychology and optical array are elaborated and connected to recent development of studies in spatial vision and pattern recognition. Techniques include electrophysiology, psychophysics and brain imaging. Required for psychology majors in the visual perception track. Students may take this course for liberal arts or institute elective credit. (0514-210, 350, 400) **Class 4, Credit 4 (offered occasionally)**

**0514-543 Depth and Motion Perception**  
This course surveys such topics as monocular and binocular depth cues, size and shape constancy, stereopsis, direction perception, apparent motion, structure-from-motion, heading perception and self-motion. Gibsonian approaches to perception are contrasted with more traditional indirect perception approaches. The physiological bases of depth and motion perception are covered, as are practical applications of work in the area. Required visual perception track course for psychology majors. Students may take this course for liberal arts or institute elective credit. (0514-210, 350, 400) **Class 4, Credit 4 (offered occasionally)**

**0514-544 History and Systems**  
Course provides background to the development of current psychological perspectives. It examines beliefs, practices, achievements and limitations of various systems of psychology from Greek times to the late 20th century. Part of the psychology concentration and minor. Students may take this course as liberal arts or institute elective credit. (0514-210 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0514-545 Brain and Behavior**  
Introduction to the neurobiological basis of cognition and behavior. Topics include hemispheric specialization, localization of function, brain injury, neuropsychological testing and functional neuroimaging. Emphasis is on higher brain functions such as language, memory and visuospatial processing with an evolutionary perspective. Laboratory work focuses on EEG correlates of attention and cognition. Part of the biopsychology track for the psychology degree program. This course is open to non-majors as an elective in their professional program. It cannot be used to fulfill a liberal arts requirement. (0514-210, 350, 400) **Class 4, Credit 4 (offered occasionally)**

0514-546

#### Right Brain Left Brain

A comprehensive introduction to hemispheric specialization, including clinical and scientific relevance of brain asymmetry. Topics include localization of function, split-brain procedures, neuropsychological testing, interhemispheric interactions and functional neuroimaging. Emphasis is on higher brain functions such as language, memory and visuospatial processing in an evolutionary context. Laboratory work focuses on lateralized tachistoscopic designs to investigate normal language function. Part of the biopsychology track for the psychology degree program. This course is open to non-majors as a professional elective. It cannot be used to fulfill a liberal arts requirement. (0514-210, 350, 400) **Class 4, Credit 4 (offered occasionally)**

0514-547

#### Brainwaves and Behavior

Introduction to the study of human EEG, also known as brainwaves. EEG analysis is the original functional neuroimaging technique for visualizing brain activity in healthy and patient populations during cognitive tasks. Advances in functional neuroimaging have triggered a revolution in research on the biological bases of cognition, emotion and psychiatric disorders. This course provides a forum in which students can learn about recent EEG findings and applications. Methods for evoking brain activity and how to analyze EEG data as well as the limitations of neuroimaging results will be explored. Part of the biopsychology track for the psychology degree program. This course is open to non-majors as a professional elective. It cannot be used to fulfill a liberal arts requirement. (0514-214, 350, 400) **Class 4, Credit 4 (offered occasionally)**

0514-548

#### Biological Bases of Mental Disorders

A comprehensive introduction to the biological foundations of schizophrenia, depression, autism, bipolar disorder, Tourette's syndrome and other mental disorders. Topics include neuropsychological testing, etiology, and structural and functional neuroimaging. Laboratory work will focus on language and cognitive function in one or two of these disorders. Part of the biopsychology and clinical psychology tracks for the psychology degree program. This course is open to non-majors as a professional elective. It cannot be used to fulfill a liberal arts requirement. (0514-210, 350, 400) **Class 4, Credit 4 (offered occasionally)**

0514-549

#### Introduction to Clinical Psychology

The purpose of this course is to provide an overview of the field of clinical psychology. The course is designed for upper-level undergraduate students interested in learning more about this specific field. Students will learn about the primary tasks of a clinical psychologist, including fundamentals of assessment, clinical research, conceptualizing problems and psychotherapy. In addition, students will learn about educational and professional behavior and controversial issues within the field. Part of the clinical psychology track for the psychology degree program. This course is open to non-majors as a professional elective. It cannot be used to fulfill a liberal arts requirement. (0514-210, 350, 400) **Class 4, Credit 4 (offered occasionally)**

0514-550

#### Psychological Testing

This course will explore the theories, methods and applications of psychological testing. The advantages and drawbacks of psychological testing in general, and selected tests in particular, will be emphasized. The use of tests in clinical and other applied areas of psychology is based on several assumptions. First, assessment is apt to be more useful if based upon reliable and valid information. Second, improving one's knowledge of tests will help students to gather meaningful information about people and environments. Third, it is desirable to design intervention plans based on accurate assessment data and to use data to evaluate intervention outcomes. Part of the clinical psychology track for the psychology degree program. This course is open to non-majors as a professional elective. It cannot be used to fulfill a liberal arts requirement. (0514 210, 350, 400) **Class 4, Credit 4 (offered occasionally)**

0514-551

#### Research in Clinical Psychology

This course will explore the theory and methods used to evaluate interventions in the field of clinical psychology and related human services. Topics to be covered will include within-subjects/single experiments, between-subjects experiments/clinical trials, and general program evaluation. Two primary objectives are to help students develop an appreciation for the importance of scientific evaluations of psychotherapy and other interventions and to develop skills for evaluating the efficacy of clinical interventions. Part of the clinical psychology track for the psychology degree program. This course is open to non-majors as a professional elective. It cannot be used to fulfill a liberal arts requirement. (0514-210, 350, 400) **Class 4, Credit 4 (offered occasionally)**

0514-597

#### Senior Project in Psychology

This course is intended for students in the psychology major to demonstrate independent, experimental research expertise. Students are guided by faculty advisers in conducting experimental research on an issue of their choice. Students design the method, run subjects, analyze the results of their study and write up the project in APA format. Passing this write-up qualifies students for the writing requirement in psychology. Because Senior Project is the culmination of a student's scientific research learning experience in the psychology major, it is expected that the project will be somewhat novel, will extend the theoretical understanding of their previous work (or of the previous work of another researcher), and go well beyond any similar projects that they might have done in any of their previous courses. (0514-210, 350, 400) **Class 4, Credit 4 (offered annually)**

## Sociology

0515-210

#### Foundations of Sociology

An introduction to the way sociologists interpret social reality, including the elementary terms, foundational ideas, major insights and research discoveries in the discipline. Included are topics such as statistics uses and roles, socialization, cultural variation, deviance, social stratification, social institutions and social change. Fulfills a liberal arts core social/behavioral science requirement. Counts as a prerequisite for the sociology/anthropology concentration and minor. **Class 4, Credit 4 (offered quarterly)**

0515-325

#### Honors Sociology

This course is designed to explore the fundamental insights into social behavior developed by leading historical and contemporary scholars in the field of sociology. Students will learn fundamental concepts and theories through immersion in the classics of sociological thought, the writing of giants in the field from Marx and Weber to Goffman and William Julius Wilson. The course will be organized in a seminar format in which student participation is required. Fulfills a liberal arts core social/behavioral science requirement. Counts as a prerequisite for the sociology/anthropology concentration. **Class 4, Credit 4 (offered occasionally)**

0515-406

#### Qualitative Methods

This is a course in the practical aspects of doing theoretically informed qualitative social research. Special attention will be given to the processes by which research problems are formulated, research designs selected, data gathered and interpreted, and influences and conclusions drawn. Through example, illustration and application, specific research skills will be simulated using case studies. Part of the sociology/anthropology concentration; may also be taken as an elective. Cross-listed with public policy 0521-406. **Class 4, Credit 4 (offered occasionally)**

0515-413

#### Urban Planning and Policy

This course analyzes social and spatial characteristics of cities and considers reasons for urban development, ecological factors, types and network of settlements and urbanism as a way of life. It also examines the issues of neighborhoods, suburbia, "ghetto" enclaves, metropolitan regions, urban social and political structures, planning and urban policy. Part of the sociology/anthropology concentration and minor; the public policy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

0515-441

#### The Changing Family

This course examines the essential concepts and theories fundamental to the social science of family studies. It analyzes family systems with reference to gender role, participation in the workplace, marital relationships and communication between parents and children. The course also focuses on ways in which changes in the economy and technology have influenced the form of the family and men's and women's work. Part of the sociology/anthropology concentration and minor; may also be taken as an elective. (0515-210, 0510-210 or equivalent) **Class 4, Credit 4 (offered annually)**

0515-442

#### The Urban Experience

This sociology course analyzes social and spatial characteristics of cities and considers reasons for urban development, ecological factors, types and networks of settlements and urbanism as a way of life. Also examines the issues of neighborhoods, subareas, ghetto enclaves, metropolitan regions, urban social and political structures, problems, services and planning. Part of the sociology/anthropology concentration and minor; may also be taken as an elective. (0515-210, 0510-210 or equivalent) **Class 4, Credit 4 (offered annually)**

- 0515-443** **Sociology of Work**  
This course analyzes continuity and change in the way work is organized, performed and experienced within national and global contexts. Major sociological perspectives on work are examined and applied to areas such as workplace and occupational culture, the experience of work as satisfying and alienating, occupational change, unions and union busting, health and safety, labor law, and social stratification at work. Interrelations between work and other social institutions, such as family, economy, polity, leisure and education, are examined. Part of the sociology/anthropology concentration and minor; may also be taken as an elective. (0515-210, 0510-210 or equivalent) **Class 4, Credit 4 (offered annually)**
- 0515-444** **Social Change**  
This course describes and applies competing explanations for major transitions in a variety of institutions, including the economy, work, politics, family and education. These transitions are seen within historical and global contexts, but the interplay of these changing social structures with individual experience is explored as well. Topics include economic, racial and gender stratification, culture, labor-management relations, and the source and consequences of technological change. As future professionals in technical fields, students will learn to understand, assess and manage social change rather than to simply react to it. Part of the sociology/anthropology concentration and minor; the social welfare policy minor; may also be taken as an elective. (0515-210, 0510-210 or equivalent) **Class 4, Credit 4 (offered annually)**
- 0515-446** **Sociology of Health**  
A survey of the sociological aspects of health and illness. Some areas of study will be the definition, causes (etiology) and cure of disease in various societies and social groups. Also included is a discussion of the epidemiology of disease, access to and delivery of health care in contemporary U.S. society, problems of patient care, and the study of mental illness and death and/or dying. Part of the sociology/anthropology concentration and minor; may also be taken as an elective. (0510-210, 0515-210 or equivalent) **Class 4, Credit 4 (offered annually)**
- 0515-447** **Women, Work and Culture**  
Broad sociological issues affecting women, work and culture are a result of the emerging global economy and technological revolution. The course will consider how the process of gender socialization is complicated by the way in which gender intersects with racial, class, ethnic, sexual and other identities. This course will present the major theoretical perspectives employed in sociology and women's studies and consider how they relate to the study of women, work and culture. Part of the sociology/anthropology concentration and minor; may also be taken as an elective. (0510-210, 0515-210 or equivalent) Cross-listed with women's and gender studies 0522-447. **Class 4, Credit 4 (offered annually)**
- 0515-448** **Minority Group Relations**  
Deals with the principal concepts and research findings of those who have studied racial and ethnic minorities and their relations. Taking into account the growing body of theory and data on the dynamics of ethnic prejudice and discrimination, the course is concerned with the subcultures of minorities; the nature of prejudice and discrimination; the etiology, patterns and consequences of intergroup conflict; and the reactions of minorities to differential and discriminatory treatment. Concepts such as assimilation, amalgamation and desegregation are analyzed as forms of conflict resolution. Part of the sociology/anthropology and minority group relations concentrations; may also be taken as an elective. (0510-210, 0515-210 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0515-449** **Population and Society**  
Study of demographic variables of mortality, fertility and migration as they affect the rise and quality of population. Part of the sociology/anthropology concentration and minor; may also be taken as an elective. Part of the environmental studies minor (0510-210, 0515-210 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0515-451** **Transfer Technology and Globalization**  
This course provides an understanding of theoretical perspectives, directions, processes and consequences of transfer of technology from modern to developing societies. It also examines the diffusion of technologies; that is, the process through which they spread from their initial sources into various national and international organizations (e.g., multinational firms, factories, communities and homes). The course also analyzes the consequences of conventional technological transfers and the need for appropriate technology for developing countries. Part of the science and technology studies concentration; the science, technology and environmental studies minor; the sociology/anthropology and public policy concentrations and minors; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0515-452** **Special Topics: Sociology**  
This course focuses on issues and topics not otherwise covered in established sociology courses. The courses will concentrate on student discussion and interaction surrounding required readings. This course may be taken as an elective. (0515-210 or 0510-210) **Class 4, Credit 4 (offered occasionally)**
- 0515-482** **African American Culture**  
Analyzes past, present and future social policies, programs and practices from their actual and predictable effects on black people. These analyses and solutions include particular emphasis on how the black community has been forced to develop mechanisms for coping with the debilitating effects of poverty, environmental deprivation and institutional racism. Presents a systematic means of facilitating change in people's attitudes and behaviors. Part of the sociology/anthropology and minority relations concentration; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0515-483** **Hispanic American Culture**  
The study of the social experiences and conditions of Hispanic Americans and the degree to which they have been assimilated into the mainstream dominant culture. Various Hispanic groups are studied with the goal of defining and outlining their differences and similarities. The Puerto Ricans in the Northeast and the Mexican Americans in the Southwest are specifically selected for analysis. Helps students to better understand the problems faced by Hispanic Americans by looking at specific socio-economic indicators such as their access to health care, job opportunities, educational institutions and the degree to which Hispanics have "progressed" in the U.S. Part of the sociology/anthropology, minority relations, and Latino/Latina/Latin American concentrations; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0515-485** **Diversity in the City**  
This course examines the city as an amalgamation of diverse communities with people engaged in interpreting and responding to urban life. It examines changes in the structure of urban neighborhoods and how these neighborhoods are impacted by social, economic and political conditions. Issues such as urban poverty, unemployment, crime and homelessness will be investigated. Part of the sociology concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0515-506** **Social Inequality**  
A survey course that examines different dimensions of stratification in the U.S. and elsewhere. Explanations for the existence of inequality are addressed at individual, group and institutional levels. Part of the sociology/anthropology concentration; may also be taken as an elective. (0510-210, 0515-210 or equivalent) **Class 4, Credit 4 (offered occasionally)**
- 0515-507** **Complex Organizations**  
Analyzes the structure and dynamics of a wide variety of social organizations (government bureaucracies, corporations and voluntary groups). Topics include theories of organization, organizational processes, technological impact, and organizational change and development. An examination of the internal operation of large organizations includes sources of power and authority, modes of communication and division of labor as well as tension, stress and strain. Part of the sociology/anthropology concentration may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**
- 0515-508** **Aging and Society**  
Considers concepts, issues and research techniques in the behavioral and biological aspects of aging. Examines the interaction of group processes in the family and community that influence society's attitudes toward the aging process. Further examines the cultural, environmental and institutional changes as they relate to an increasing population of older people. **Class 4, Credit 4 (offered occasionally)**
- 0515-509** **Social Policy**  
An examination of social policy formulation in a variety of contexts from local government to national government. Special attention is given to the strategies, choices and priorities in the formulation of social policy. Deals with historical development of social policies, including the issues of health, aging, poverty, family and children. Also examines the question of how social values and the economy influence policy development. Part of the sociology/anthropology concentration; may also be taken as an elective. Part of the legal studies minor. **Class 4, Credit 4 (offered occasionally)**

**0515-515** **Social Policy and Aging**  
Course work is organized around culture and values as the context for policy formulation. Special attention is given to the process of policy analysis and implementation. Several specific policy areas are examined: social security and income maintenance; health and long-term care; work and retirement; social services and the aging network; housing and living arrangements for the elderly; and the role of the family and the elderly. Part of the sociology/anthropology concentration; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0515-524** **Applied Sociology**  
Provides the student with useful sociological knowledge applicable to solutions of practical problems. The inventory of problems is not fixed beforehand, and the specific course content reflects the problems either already encountered by students or very likely to represent a significant portion of their anticipated professional concern upon graduation. Part of the sociology/anthropology concentration; may also be taken as an elective. (Permission of instructor) **Class 4, Credit 4 (offered occasionally)**

**0515-529** **Deaf Culture in America**  
An introductory survey of culture among various groups of deaf people in the United States. Students study the scholarly literature dealing with these groups and have contact with members of this community. Familiarizes students with the characteristics of deaf culture as well as general perceptions of deafness and the deaf community within the dominant hearing society. Students should come to recognize and appreciate this segment of American cultural diversity. Part of the sociology/anthropology and ASL language/culture concentrations; may also be taken as an elective. (0510-210, 0515-210 or equivalent) **Class 4, Credit 4 (offered annually)**

**0515-569** **Human Sexuality**  
This course is sex positive in its approach to the study of human sexual behavior. It focuses upon basic physiology, sexual awareness, sexual development throughout the life cycle, sex roles, sexual myths, legal and social issues, premarital and marital sexual behavior, and alternative sexual choices. Frequently these issues raise questions of sexual attitude and value, and these are examined and clarified. Part of the sociology/anthropology concentration; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

### **Interdisciplinary—Aerospace**

**0519-201** **History of Airpower I**  
This course is the first in a three-course sequence that examines air and space power from a historical perspective. The course traces the evolution of air and space power from the first balloons and dirigibles to the space age global positioning systems used in recent conflicts. The first course covers early flight, World War I, interwar years and World War II. It examines the impact of air and space power on military and non-military operations in support of U.S. foreign and domestic policy and its role in future warfare. Required for second-year ROTC students. **Class 1, Credit 1 (offered annually)**

**0519-202** **History of Airpower II**  
The second of a three-course sequence that examines air and space power from a historical perspective. The second course covers the formation of an independent U.S. air force, the Berlin Airlift, Cold War deterrent policy and the Vietnam conflict. It examines the impact of air and space power on military and non-military operations in support of U.S. foreign and domestic policy and its role in 20th century warfare. Required for second-year ROTC students. **Class 2, Credit 2 (offered occasionally)**

**0519-203** **History of Airpower III**  
The third of a three-course sequence that examines air and space power from a historical perspective. The final course covers the post-Vietnam reorganization, the Persian Gulf Wars, Kosovo, war on terror, and the future of air and space power. It examines the impact of air and space power on military and non-military operations in support of U.S. foreign and domestic policy and their role in future warfare. Required for second-year ROTC students. **Class 1, Credit 1 (offered occasionally)**

**0520-201** **Career Exploration Seminar**  
This seminar is designed to introduce students to the process by which they can make informed decisions in selecting a career and identifying an educational program that will lead to that goal. Students begin the quarter by assessing, in a small group setting and with the assistance of facilitators familiar with careers and with RIT programs, their own skills and working styles. They then research careers that match their personal profiles. Finally, they research academic programs that lead to the careers they have identified. This includes interviewing faculty and administrators in campus programs as well as professionals working in the fields. This seminar is required for RIT exploration program students. **Class 1, Credit 1 (offered quarterly)**

### **Interdisciplinary—Liberal Arts**

**0520-501** **Senior Seminar**  
Senior Seminar is a capstone liberal arts course for all baccalaureate degree students. Students, through the Gannett Lecture Series and selected readings and films, analyze, discuss and debate a social issue of current concern as it relates to their future roles as citizens in a global world. The issue, selected for two years by the Liberal Arts faculty, relates scientific, technical and artistic topics to their social contexts. Students write extensively and receive faculty feedback to refine their written communications skills as they enter the professional world. **Class 2, Credit 2 (offered quarterly)**

### **Public Policy**

**0521-210** **Introduction to Public Policy**  
This course provides students with an introduction to the interdisciplinary field of public policy. The course will introduce students to the fundamental theories, concepts and models of public policy making, with an emphasis on policy formation, adoption, implementation and evaluation. Policy issues will be discussed in a range of contexts, including health policy, environmental policy, defense policy, energy policy and technology policy, among others. May be taken as an additional general education course. **Class 4, Credit 4 (offered annually)**

**0521-301** **Values and Public Policy**  
The course will introduce the student to a range of ethical issues that arise in policy decision making and policy analysis. It will focus on the types of ethical reasoning that are utilized by focusing on a series of case studies. **Class 4, Credit 4 (offered annually)**

**0521-400** **Foundations of Public Policy**  
This interdisciplinary course will introduce the student to the concept of public policy, the policy-making process, the role of stakeholders and interest groups, and the basic dimensions of quantitative and qualitative policy analysis. A range of public policy issues, such as environmental policy, science and technology policy, and information and communications policy will be explored. Part of the public policy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0521-401** **Values and Public Policy**  
This course focuses on the connections and interplay between personal and social values and public policy. It explores how values and norms influence public policies and how the resulting expressions of values within public policy impact the implementation and effectiveness of policy choices. The course also considers how new developments in science and technology influence the interplay between values and policy. In addition, this course explores how to formulate values-based explanations of certain public policy preferences. A required course in the public policy undergraduate curriculum; part of the public policy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered biannually)**

**0521-402** **Policy Analysis I**  
This course is the first in a three-course sequence (Policy Analysis I-III) that normally will be taken in the third year of the program. The purpose of the three-course sequence is to introduce the student to both qualitative and quantitative policy analyses and to progressively integrate qualitative and quantitative dimensions of analysis into a systematic whole. Students will learn to apply a suite of analytical tools to better understand and evaluate public policy. Part of the public policy concentration and minor; may also be taken as an elective. (0521-406, 0511-401 and 1016-319 or equivalent; 0511-450 or departmental approval) **Class 4, Credit 4 (offered annually)**



**0521-403** **Policy Analysis II**  
This is the second in a three-course sequence (Policy Analysis I-III) that normally will be taken in the third year of the program. This course will assist students in integrating both quantitative and qualitative analysis in the context of their areas of developing specialization emerging from track courses. In this course, students continue to acquire new tools and techniques to analyze public policies. Part of the public policy concentration and minor; may also be taken as an elective. (0521-402, 0511-457 or 1016-320 or equivalent) **Class 4, Credit 4 (offered annually)**

**0521-404** **Policy Analysis III**  
This is the third in a three-course sequence (Policy Analysis I-III) that normally will be taken in the third year of the program. This course will provide students an opportunity to develop an analysis and proposal of a particular policy issue. The course continues to build upon the tools of Policy Analysis I and II using a case study and project-based approach. Part of the public policy concentration and minor; may also be taken as an elective. (0521-403) **Class 4, Credit 4 (offered annually)**

**0521-405** **Senior Project I**  
The culminating educational experience for public policy students. The principal focus is an independent study project, centered on a major policy issue drawn from the student's chosen specialization. In Senior Project I, students conduct research and produce their project report under the guidance of a faculty adviser on their senior project. An approved project proposal and permission of the department are required to register for this course. (0521-404) **Class 4, Credit 4 (offered annually)**

**0521-406** **Introduction to Qualitative Policy Analysis**  
This is a course in the practical aspects of doing theoretically informed qualitative social research. Special attention will be given to the processes by which research problems are formulated, research designs selected, data gathered and interpreted, and inferences and conclusions drawn. Through example, illustration and application, specific research skills will be simulated using case studies. Part of the public policy concentration and minor; may also be taken as an elective. (0521-400) **Class 4, Credit 4 (offered annually)**

**0521-407** **Senior Project II**  
The culminating educational experience for public policy students. The principal focus is an independent study project centered on a major policy issue drawn from the student's chosen specialization. In Senior Project II students conduct research and produce their project report under the guidance of a faculty adviser on their senior project. Permission of department is required to register for this course. (0521-404) **Class 4, Credit 4 (offered annually)**

**0521-408** **Technological Innovation and Public Policy**  
Technological innovation, the incremental and revolutionary improvements in technology, has been a major causal factor for economic growth and social and political change. This course will introduce generic models of innovation that span multiple sectors, including energy, environment, bio- and information technologies. The course will then analyze how governments choose policies to spur innovation. Part of the public policy concentration and minor; may also be taken as an elective. (0521-400 or permission of the department) **Class 4, Credit 4 (offered annually)**

**0521-410** **Information and Communication Policy**  
This course examines how federal and international policies are developed to influence innovation of information and computer technology. In particular, the course will examine such topics as privacy, freedom of speech, intellectual property rights, access to information technology and regulation of the Internet. Part of the public policy concentration and minor; may also be taken as an elective. (0521-400) **Class 4, Credit 4 (offered annually)**

**0521-449** **Special Topics in Public Policy**  
This course will examine current topics in public policy. It may be used with consent of adviser as a policy core elective or track elective for the public policy BS degree. Part of the public policy concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0521-451** **Energy Policy**  
This course provides an overview of energy resources, technologies and policies designed to ensure clean, stable supplies of energy for the future. The course evaluates the impacts of fossil fuel, renewable energy and hydrogen technologies on society and how public policies can be used to influence their development. The development of U.S. energy policy is of particular concern, although a global perspective will be integrated throughout the course. No prerequisite. Part of the public policy degree program. Part of the public policy concentration and minor; the science, technology and environment minor and the environmental studies concentration. **Class 4, Credit 4 (offered bi-annually)**

**0521-460** **Public Policy Capstone for Minors**  
The overall objective of the course is to tie together the theories and applied skills learned in other public policy minor courses within a common analytical and theoretical framework of public policy formation and implementation. Students will apply their knowledge to a contemporary problem or issue related to science, technology and policy. Readings, lecture, case studies and projects will be used to highlight commonalities and dissimilarities among different policy regimes. Students must have department approval to register. Part of the public policy minor; cannot be used as an elective. **Class 4, Credit 4 (offered occasionally)**

## Women's and Gender Studies

**0522-400** **Foundations of Women's and Gender Studies**  
This course will use an interdisciplinary perspective to provide an introduction to women's studies, the academic manifestation of feminism. The course will focus on the rise of feminist consciousness in the Western world from the middle ages to the late 20th century. It will consider the concept of patriarchy, its dominance for the past four millennia, and the multitude of efforts by women and men to conceptualize an alternative world view. The course will consider key historical patriarchal and feminist texts, study the rise of feminist thought, and consider the history of women's activism and the women's rights movement from the late 18th century through the second half of the 20th century. The course will also consider feminist theory and the rise of feminism. The course will conclude with a survey of feminist practice in a wide range of contemporary issues and consider strategies for negotiating daily life. Part of women's and gender studies concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0522-401** **American Women: Colonies to 1848**  
This course considers the history of American women from the colonial era to the Seneca Falls Convention. We will examine the experiences of women of different races and classes across the country, looking at Puritans in Massachusetts and at planters' daughters in the Carolinas; at female slaves in the deep South and at mill workers in the urban North. We will investigate the impact of the American Revolution movement, culminating in the convention at Seneca Falls. Part of the women's and gender studies concentration and minor; may also be taken as an elective. Cross-listed with history 0507-401. **Class 4, Credit 4 (offered annually)**

**0522-402** **American Women: 1848 to Today**  
This course considers the history of American women from the Seneca Falls Convention to the present. We will trace the impact of the first women's rights convention and follow the story of the struggle for the vote. We will also consider the role of women in other important 19th century reform movements, including abolition, temperance, spiritualism and progressivism. We will also look at the varied experience of women in the 20th century from birth control to second-wave feminism to co-education. Part of the women's and gender studies concentration and minor; may also be taken as an elective. Cross-listed with history 0507-402) **Class 4, Credit 4 (offered annually)**

**0522-405** **Women and Science**  
This interdisciplinary women's studies course links science, feminist theory, history and biography in recognizing the importance of gender to the study and practice of science. The course focuses on four critical concerns: recognition of women pioneers in the sciences, analysis of the barriers women scientists have faced historically and presently, awareness of the historical roots and exclusions of women in science, and examination of how the practice of science particularly affects women. This course is relevant to non-science majors as well as those majoring in the field. Part of the women's and gender studies concentration and minor and science writing minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0522-406** **Feminist Theory**  
This course will introduce students to the foundations of feminism in political theory, and it will critically explore how feminist concepts can be expanded to take account of class, race and sexuality. We will examine the differences between the categories of sex and gender and the ways in which feminist understandings of human experience have modified traditional philosophical accounts of reality, knowledge, morality and justice. Part of the women's and gender studies concentration and minor; may also be taken as an elective. Cross-listed with philosophy 0509-454. **Class 4, Credit 4 (offered occasionally)**

**0522-407** **Seminar on Sexual Violence**  
The course is intended to familiarize students with sexual crimes and violence as they interface with each phase of the criminal justice system, including enforcement, adjudication, treatment and prevention. Discussion will include laws related to sex offenses, types of sex crime, child sexual abuse, the psychology and treatment of sex offenders, prevention and victim aftercare. Part of the women's and gender studies concentration and minor; may also be taken as an elective. Cross-listed with criminal justice, Major Issues: Seminar in Sexual Violence. **Class 4, Credit 4 (offered occasionally)**

**0522-408** **American Film in the Studio Era**  
This course examines the history and aesthetics of the motion picture in the U.S. during the classical Hollywood studio period. Emphasis will be on the analysis of both the work of major American film makers and the evolution of major American film genres. Among the filmmakers to be studied are Griffith, Chaplin, Hawks, Ford, Capra, Welles, Hitchcock, Wilder and Kubrick. Genres to be covered include the melodrama, silent comedy, screwball comedy, western, thriller, film noir and gangster film. The films will be studied within the context of contemporary cultural and political events and will be discussed from several viewpoints, including aesthetic, technical, social and economic. Part of the women's and gender studies minor only as an affiliated course; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0522-410** **Introduction to GLBT Studies**  
This introductory course examines a broad range of gay, lesbian, bisexual and transgender issues within the historical, psychological, racial, theological, cultural and legal contexts in which we live. Students will learn the historical and theoretical foundations of GLBT studies as well as the contemporary implications for family, work, religion and law for GLBT people and the mainstream society. Students will have the opportunity to compare the regulation of sexual orientation across different gender, race and socioeconomic communities. Part of the women's and gender studies concentration and minor; may be used as an elective. No prerequisite. **Class 4, Credit 4 (offered annually)**

**0522-415** **Domestic Violence**  
The course will cover the history of domestic violence as a social problem, its dynamics, prevalence, outcomes, theories, research issues, and contemporary domestic violence policy. Special emphasis will be on the cycle of violence; the effects of children's exposure to family violence; and the intersectionality of race, gender, class and sexuality. It will include readings from the social sciences as well as literary texts. No prerequisite. Part of the women's studies concentration and minor; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0522-436** **Women's Stories, Women's Films**  
This course will provide an introduction to women's films through an exploration of narrative structure in films made by women. Through film screenings and class discussion, the course will examine the themes and issues of women's narratives and how they are presented in the medium of film. The hero's journey and traditional narrative structure will be contrasted with the heroine's journey and the more personal storytelling style of the feminine. The course will also examine differences between films made by women and films made by men about women. The course will introduce the work of feminist film critics and consider the relevance of those theories to women's roles in current films. In addition, the course will view women's storytelling in a context of feminine mythology and women's psychology. Part of the women's and gender studies concentration and minor. Cross-listed with CIAS 2065- 553 and fine arts 0505-439. **Class 4, Credit 4 (offered annually)**

**0522-446** **Women and Crime**  
Deals with women as criminal offenders and as victims of crime, focusing on theories about women in crime, types of crimes committed, patterns of criminality and the treatment of women offenders. Also examines the role of women as law enforcement officers, judges, lawyers and correctional officers in the criminal justice system. Part of the women's and gender studies concentration and minor; may also be taken as an elective. Cross-listed with criminal justice 0501-446. **Class 4, Credit 4 (offered occasionally)**

**0522-447** **Women, Work and Culture**  
Broad sociological issues affecting women, work and culture are a result of the emerging global economy and technological revolution. The course will consider how the process of gender socialization is complicated by the way in which gender intersects with racial, class ethnic, sexual, and other identities. This course will present the major theoretical perspectives employed in sociology and women's studies and consider how they are related to the study of women, work and culture. Part of the women's and gender studies concentration and minor; may also be taken as an elective. (0510-210, 0515-210 or equivalent) Cross-listed with sociology 0515-447. **Class 4, Credit 4 (offered annually)**

**0522-449** **History of Women in Science and Engineering**  
This course will explore the gendered nature of Western science and technology. We will focus on three areas: the history of women's participation in science and engineering since the birth of modern science in the 17th century; the historical roots of gender bias in the scientific enterprise; and current debates over whether women have changed science and engineering since the 1970's. Special attention will be paid to the experience of women in engineering, one of the most male-dominated professions. The course will focus on minority and non-minority women in Western Europe and the United States and will occasionally employ cross-cultural contexts. Part of the women's and gender studies concentration and minor; may also be taken as an elective. Cross-listed with science and technology studies 0508-449. **Class 4, Credit 4 (offered occasionally)**

**0522-450** **Gender, Science and Technology**  
This course explores feminist critiques of Western science and technology by investigating the ways in which gender, power and politics shape the content and context of science and technology. Particular attention is paid to social and cultural dimensions of scientific and technological practices, including the development of theory, method and application. Part of the women's and gender studies concentration and minor; may also be taken as an elective. Cross-listed with science and technology studies 0508-452. **Class 4, Credit 4 (offered occasionally)**

**0522-451** **Gender and Sexuality**  
This course explores issues of gender and sexuality in a global context. Students will be introduced to anthropological perspectives on the experience of men and women, as gendered subjects, in different societies and historical contexts such as colonialism, nationalism and global capitalism. In turn, we will explore how cultural constructions of masculinity and femininity are configured by race, class, ethnicity and sexual orientation. Course materials are drawn from an array of sources, reflecting various theoretical perspectives and ethnographic views from different parts of the world. Part of the women's studies concentration and minor; may be taken as an elective. (0510-210 or 0515-210) **Class 4, Credit 4 (offered annually)**

**0522-452** **Bodies and Culture**  
The body in culture, society and history. Comparative approaches to the cultural construction of bodies and the impact of ethnic, gender and racial differences on body practices (i.e., surgical alteration, mutilation, beautification, surrogacy, erotica). The formation of normative discourses of the body (regarding sexuality, AIDS/illness, reproduction, fat/food) in medical science, consumer culture and the mass media. The course will be discussion and project oriented, encouraging students to acquire a range of analytic skills through a combination of text interpretation and research. Part of the women's studies concentration and minor; may be taken as an elective. (0510-210 or 0515-210) **Class 4, Credit 4 (offered annually)**

**0522-453** **Economic Role of Women**  
This course applies economic theory to explain choices faced and selected by women concerning marriage, fertility and labor market participation, alongside government policies targeting those decisions. Empirical research will be presented that describes the changing demographic profile of families, poverty and the labor force. Students in this course will gain experience evaluating how economic theory and practice fits into the larger social sciences goal of describing human behavior by focusing on the changing economic role of women. Part of the women's studies concentration and minor; may be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0522-459** **Toni Morrison**  
Through reading and discussion of Toni Morrison's novels and feminist and African American critical theory, this course will allow students to follow the development of Morrison's art and to approach her work from alternative critical perspectives. Particular attention will be paid to the role of narrative in African American culture and to Morrison's understanding of its literary, historical and political functions. Part of the women's and gender studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) Cross-listed with language and literature 0504-459. **Class 4, Credit 4**

0522-480

### Women and the Visual Arts

Examines the image of women in the visual arts and the role of women image makers. Major topics include the variety of images of women; the evolution and change of these images over time; media images (as differentiated from fine art images) of women; images of women by women and by men; women's images and the issues of their relationship to the images made by men; the nude and pornography; history of women artists; selected women artists and their work; relation of their work to the art of the period; current issues and status of women artists. Part of the women's and gender studies concentration and minor; may also be taken as an elective. Cross-listed with fine arts 0505 480. **Class 4, Credit 4 (offered annually)**

0522-481

### Women in Literature

Concentrates on literature by women, about women, primarily from the early 19th century to the present. Considers the aspirations, frustrations and achievements of women as documented by themselves as well as the perceptions and representations of women in literature by male writers. Works are examined for their literary value as well as their documentation of broader feminist issues. Part of the women's and gender studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) Cross-listed with language and literature 0504-480. **Class 4, Credit 4 (offered occasionally)**

0522-482

### Women in Politics

A study of feminist thought as it applies to the political, economic and social status of women and how it has been expressed through the women's political movement. Students study a number of public policies as they apply to and affect women and examine the opportunities for women to participate in the political process. Part of the women's and gender studies concentration and minor; may also be taken as an elective. (0513-211, 214 or equivalent) Cross-listed with political science 0513-481. **Class 4, Credit 4 (offered occasionally)**

0522-483

### Psychology of Women

Examines the relevance and applicability of present psychological theory and research to the understanding of the development and behavior of women. Major topics include psychological and biological sex differences, psychological theories of women's development, the relationship between female personality development and various sociocultural factors, women's place in society, women and their bodies, and women and mental health. Part of the women's and gender studies concentration and minor; may also be taken as an elective. Cross-listed with psychology 0514-480. **Class 4, Credit 4 (offered occasionally)**

0522-484

### Autobiography

According to poet James Merrill, we live in the age of "me-moir," at least in American culture. But what happens to the quarrel between truth and fiction, to the almighty autonomous "I," as we move outside of England and America? What "outlaw" forms of language and representation do a street fighter from Morocco, a Soweto social worker or an AIDS diarist use to write the self? How do international sex workers, a New Zealand filmmaker and the author of *The English Patient* negotiate the charged relationships of family, nation, class and gender? Expect to encounter visuals and biographies from art, photography and film as well as projects in the classroom and out in the community in this course. Part of the women's and gender studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) Cross-listed with language and literature 0504-490. **Class 4, Credit 4 (offered occasionally)**

0522-492

### Native American Women's Experience

This course examines the unique status of Native American women in tribal and Euroamerican societies. Given the gender complementary construction of many tribal communities, Native women long enjoyed a status and power not found in Europe, but this equality has been altered in many tribes as a result of colonialism. We will study how Native women have responded to assaults on the "feminine principle," as Paula Gunn Allen terms it, and how they have sought to rebuild tribal communities along the lines of traditional values. We will examine the following themes in Native women's lives: tribal gender roles, nation, community, family, class, work, race, sexuality, disability, culture-bearing, environment, land, health and representation. Part of the women's and gender studies concentration and minor; may also be taken as an elective. (0502-227 or equivalent) Cross-listed with language and literature 0504-492. **Class 4 Credit 4 (offered occasionally)**

## International Studies

0524-210

### Introduction to International Studies

This lower-division course is one of five obligatory courses constituting the third or core requirement of the proposed international studies degree program. It is expected that students will enroll in this course either in their first or in their second year of study. The purpose of this course is to provide an interdisciplinary introduction to international studies by exposing students to current thinking on national and transnational civil society. No prerequisite **Class 4, Credit 4 (offered annually)**

0524-501

### Capstone Seminar in International Studies

This upper-division course constitutes the fifth and final requirement of the proposed international studies degree program. It is expected that students will enroll in this course at some point in their final year of study. This course will further develop and sharpen the student's understanding of international ideas and institutions. The course will use a problem-solving focus to provide a detailed analysis of one or more contemporary issues in the field of international studies. Required course in the IS degree program; may be taken as a professional elective in any liberal arts degree program. (Introduction to IS and permission of instructor) **Class 4, Credit 4 (offered twice annually)**

## Foreign Language

0525-390

### American Sign Language I

This is the first course in a three-course sequence. This sequence is a study of the origins, nature and development of American Sign Language (ASL) and its variants, as used by the deaf population of North America. Integral to the courses is a study of the linguistic structure of ASL and the nature of signing as a linguistic modality. Prerequisite for the ASL language/culture concentration; may also be taken as an elective or for arts of expression credit. **Class 4, Credit 4 (offered regularly)**

0525-391

### American Sign Language II

This is the second course in a three-course sequence. This sequence is a study of the origins, nature and development of American Sign Language (ASL) and its variants, as used by the deaf population of North America. Integral to the course is a study of the linguistic structure of ASL and the nature of signing as a linguistic modality. Part of the ASL language/culture concentration; may also be taken as an elective. (0525-390; see instructor for placement into appropriate course if this is the first ASL course at RIT) **Class 4, Credit 4 (offered regularly)**

0525-392

### American Sign Language III

This is the third course in a three-course sequence. This sequence is a study of the origins, nature and development of American Sign Language (ASL) and its variants, as used by the deaf population of North America. Integral to the course is a study of the linguistic structure of ASL and the nature of signing as a linguistic modality. Part of the ASL language/culture concentration; may also be taken as an elective. (0525-391; see instructor for placement into appropriate course if this is the first ASL course at RIT) **Class 4, Credit 4 (offered regularly)**

0525-400

### Beginning Arabic I

Beginning Arabic I introduces students with no prior knowledge of the language modern standard Arabic. Beginning Arabic I builds the foundation skills in speaking, listening, reading, writing, and culture. Beginning Arabic I or equivalent proficiency is the prerequisite for the Arabic language/culture concentration; may be taken as an elective or for arts of expression credit. **Class 4, Credit 4 (F)**

0525-401

### Beginning Arabic II

Beginning Arabic II focuses on the development of functional competence in speaking, listening, reading, writing and culture. Part of the Arabic language/culture concentration; the Arabic language and Arabic language/culture minors; may also be taken as an elective. See world languages coordinator if this is the first Arabic course at RIT. **Class 4, Credit 4 (W)**

0525-402

### Beginning Arabic III

Beginning Arabic III works on further development of functional skills in speaking, listening, reading, writing and culture, with emphasis on conversation. Part of the Arabic language/culture concentration; the Arabic language and Arabic language/culture minors; may also be taken as an elective. See world languages coordinator if this is the first Arabic course at RIT. **Class 4, Credit 4 (S)**

**0525-403** **Intermediate Arabic I**  
Intermediate Arabic I continues more intermediate-level development of functional skills in speaking, listening, reading, writing and culture, with emphasis on conversation. Part of the Arabic language/culture concentration; the Arabic language and Arabic language/culture minors; may also be taken as an elective. See instructor for placement into appropriate course if this is the first Arabic course at RIT. **Class 4, Credit 4 (F)**

**0525-404** **Intermediate Arabic II**  
Intermediate Arabic II continues more intermediate-level work in all skills, including conversation, with increased work in reading and writing. Part of the Arabic language/culture concentration; the Arabic language and Arabic language/culture minors; may also be taken as an elective. See world languages coordinator if this is your first RIT Arabic course. **Class 4, Credit 4 (W)**

**0525-405** **Intermediate Arabic III**  
Intermediate Arabic III, last of the six-course sequence in Arabic language, pursues advanced intermediate work in all skills, including conversation, with increased work in reading and writing. Part of the Arabic language/culture concentration; the Arabic language and Arabic language/culture minors; may also be taken as an elective. See world languages coordinator if this is your first RIT Arabic course. **Class 4, Credit 4 (S)**

**0525-406** **Advanced Arabic I**  
This is the beginning of the advanced (third-year) sequence. Students pursue advanced work in all skills (speaking, listening, reading, writing, culture), including conversation, with increased work in reading and writing. Part of the Arabic concentration and minor; may be part of the international business concentration in Arabic. Required part of the international studies major for students choosing the Middle East as their region and Arabic as their language; may be taken as an elective. See world languages program coordinator if this is your first RIT Arabic course. (Intermediate Arabic III or equivalent proficiency and minimum GPA of 2.85) **Class 4, Credit 4 (offered regularly)**

**0525-407** **Advanced Arabic II**  
This is the second course in the advanced (third-year) sequence. Students continue study in the advanced textbook and advanced work in all skills (speaking, listening, reading, writing, culture), including conversation, with increased work in reading and writing. May be part of the Arabic concentration or minor; may be part of the international business concentration in Arabic; required part of the international studies major for students choosing the Middle East as their region and Arabic as their language; may be taken as an elective. See World Languages Program coordinator if this is your first RIT Arabic course. (Advanced Arabic I or equivalent proficiency and minimum GPA of 2.85) **Class 4, Credit 4 (F, W, S)**

**0525-408** **Advanced Arabic III**  
This is the final course in the advanced (third-year) sequence. Students continue study in the advanced-year textbook and advanced work in all skills (speaking, listening, reading, writing, culture), including conversation, with increased work in reading and writing. May be part of the Arabic concentration or minors; may be part of the international business concentration in Arabic; may be taken as an elective. See world languages program coordinator if this is your first RIT Arabic course. (Advanced Arabic II or equivalent proficiency) **Class 3, Credit 4 (F, W, S)**

**0525-419** **Special Topics: Arabic**  
Study of a topic or area in one of the foreign languages or cultures not normally offered in any other concentration or minor course; may be part of a foreign language/culture concentration or minor; may be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0525-420** **Beginning Chinese I**  
This course is designed for beginners with little or no prior study of Chinese. The course introduces students to the sounds, the writing system and basic sentence structures of Mandarin Chinese. Pinyin, the phonetic translation system for students, is taught and required throughout the course. Students learn to read and write Chinese characters. Emphasis is on developing listening and speaking skills as well as building a vocabulary based on the ideographic Chinese characters. Beginning Chinese I is a prerequisite for the Chinese language/culture concentration; may also be taken as an elective or for arts of expression credit. **Class 4, Credit 4 (offered regularly)**

**0525-421** **Beginning Chinese II**  
This course follows Beginning Chinese I. Knowledge of Pinyin is required. The focus continues to be on developing listening and speaking skills, with an increasing emphasis on reading and writing in Chinese ideographic characters. Part of the Chinese language/culture concentration; Chinese language and Chinese language/culture minors; may also be taken as an elective. (0525-420 or equivalent; see instructor for placement into appropriate course if this is the first Chinese course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-422** **Beginning Chinese III**  
This course completes first-year-level Chinese, continuing work in listening and speaking and increasing work in reading and writing Chinese characters. Pinyin is also used. By the end of the first year of course work, students will have studied 800 Chinese characters. Part of the Chinese language/culture concentration; Chinese language and Chinese language/culture minors; may also be taken as an elective. (0525-421 or equivalent; see instructor for placement into appropriate course if this is the first Chinese course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-423** **Intermediate Chinese I**  
This course begins the second-year study of Chinese. Knowledge of the Pinyin system is required for the purpose of pronunciation. The course continues to focus on developing communication skills (speaking and listening), with an increasing emphasis on reading and writing in ideographic characters and expanding vocabulary. This course includes study of culture. By the end of this course, students will have mastered approximately 1,200 Chinese characters. Part of the Chinese language/culture concentration; Chinese language and Chinese language/culture minors; may also be taken as an elective. (0525-422 or equivalent; see instructor for placement into appropriate course if this is the first Chinese course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-424** **Intermediate Chinese II**  
This course continues the second-year-level study of Chinese. Grammar structures will be reviewed. Communication skills (speaking and listening) are the focus, and special emphasis will be given to expanding vocabulary and reading and writing characters at some length. Pinyin study for pronunciation practice continues. Includes study of culture. Part of the Chinese language/culture concentration; Chinese language and Chinese language/culture minors; may also be taken as an elective. (0525-423 or equivalent; see instructor for placement into appropriate course if this is the first Chinese course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-425** **Intermediate Chinese III**  
Following Intermediate Chinese II, this course continues the grammar review, the focus on communication skills (speaking and listening), expansion of vocabulary, and more lengthy reading and writing of characters. Pinyin study for pronunciation practice continues. Includes study of culture. By the end of the second year of course work, students will have studied 1600 characters. Part of the Chinese language/culture concentration; Chinese language and Chinese language/culture minors; may also be taken as an elective. (0525-424 or equivalent; see instructor for placement into appropriate course if this is the first Chinese course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-426** **Advanced Chinese I**  
This is the first course of a three-course sequence at the advanced level. The sequence is designed to further develop competence in the four language skills of speaking, understanding, reading and writing. More complex language forms and functions required for communication in a variety of settings are introduced through text, video and authentic materials. These materials also form the basis for study of Chinese culture and society. Classroom discussion and writing practice are important parts of the course. Students will use both the traditional and simplified forms of Chinese characters in reading and writing, with Pinyin as an aid. Part of the Chinese language/culture concentration; Chinese language and Chinese language/culture minors; may also be taken as an elective. (0525-425 or equivalent; see instructor for placement into appropriate course if this is the first Chinese course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-427** **Advanced Chinese II**  
This is the second course of a three-course sequence at the advanced level. The sequence is designed to further develop competence in the four language skills of speaking, understanding, reading and writing. More complex language forms and functions required for communication in a variety of settings are introduced through text, video and authentic materials. These materials also form the basis for the study of Chinese culture and society. Classroom discussion and writing practice are important parts of the course. Students will use both the traditional and simplified forms of Chinese characters in reading and writing, with Pinyin as an aid. Part of the Chinese language/culture concentration; Chinese language and Chinese language/culture minors; may also be taken as an elective. (0525-426 or equivalent; see instructor for placement into appropriate course if this is the first Chinese course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-428** **Advanced Chinese III**  
This is the third course of a three-course sequence at the advanced level. The sequence is designed to further develop competence in the four language skills of speaking, understanding, reading and writing. More complex language forms and functions required for communication in a variety of settings are introduced through text, video and authentic materials. These materials also form the basis for the study of Chinese culture and society. Classroom discussion and writing practice are important parts of the course. Students will use both the traditional and simplified forms of Chinese characters in reading and writing, with Pinyin as an aid. Part of the Chinese language/culture concentration; Chinese language and Chinese language/culture minors; may also be taken as an elective. (0525-427 or equivalent; see instructor for placement into appropriate course if this is the first Chinese course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-439** **Special Topics: Chinese**  
Study of a topic or area in one of the foreign languages or cultures not normally offered in any other concentration or minor course. May be part of a foreign language/culture concentration or minor; may be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0525-440** **Beginning French I**  
Beginning French I is the first course in a three-course sequence. The sequence provides students without prior knowledge of the language with a sound basis for learning French as it is spoken and written today. The goal of the sequence is proficiency in communication skills, with an emphasis on oral proficiency. The sequence also acquaints students with contemporary culture and life in French-speaking countries. This course may be taken as the prerequisite for the French language/culture concentration and the French language minor; may be taken as an elective or for arts of expression credit. **Class 4, Credit 4 (offered regularly)**

**0525-441** **Beginning French II**  
Beginning French II is the second course in a three-course sequence. The sequence provides students without prior knowledge of the language with a sound basis for learning French as it is spoken and written today. The goal of the sequence is proficiency in communication skills with an emphasis on oral proficiency. Students also study contemporary culture and life in French-speaking countries. Part of the French language/culture concentration; the French language minor; may also be taken as an elective. (0525-440 or equivalent; see instructor for placement into appropriate course if this is the first French course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-442** **Beginning French III**  
Beginning French III is the third course in a three-course sequence. The sequence provides students without prior knowledge of the language with a sound basis for learning French as it is spoken and written today. The goal of the sequence is proficiency in communication skills with an emphasis on oral proficiency. Students also study contemporary life and culture in French-speaking countries. Part of the French language/culture concentration; the French language minor; may also be taken as an elective. (0525-441 or equivalent; see instructor for placement into appropriate course if this is the first French course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-443** **Intermediate French I**  
Intermediate French I is the first course of the three-course sequence at the intermediate level. This sequence provides students with the tools necessary to increase their ability to function in French. Communicative activities, contemporary texts, vocabulary study and grammar are used to expand all communication skills, especially oral proficiency. Part of the French language/culture concentration; the French language minor; may also be taken as an elective. (One year of college-level French or its equivalent; 0525-442 or equivalent; see instructor for placement into appropriate course if this is the first French course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-444** **Intermediate French II**  
Intermediate French II is the second course of the three-course sequence at the intermediate level. This sequence provides students with the tools necessary to increase their ability to function in French. Communicative activities, contemporary texts, vocabulary study and grammar are used to expand all communication skills, especially oral proficiency. Part of the French language/culture concentration; the French language minor; may also be taken as an elective. (0525-443 or equivalent; see instructor for placement into appropriate course if this is the first French course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-445** **Intermediate French III**  
Intermediate French III is the final course of the three-course sequence at the intermediate level. This sequence provides students with the tools necessary to increase their ability to function in French. Communicative activities, contemporary texts, vocabulary study and grammar are used to expand all communication skills, especially oral proficiency. Part of the French language/culture concentration; the French language minor; may also be taken as an elective. (0525-444 or equivalent; see instructor for placement into appropriate course if this is the first French course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-446** **Advanced French I**  
This course emphasizes active spoken language use. Other skills will also be used, such as reading, writing and listening, but primarily as helps for developing conversational ability. Attention will also be given to grammatical accuracy in conversation. By the end of this course, with consistent effort and attendance, the student should be able to communicate about topics routinely encountered in Francophone cultures. Part of the French language/culture concentration; the French language minor; may also be taken as an elective. (0525-445 or equivalent; see instructor for placement into appropriate course if this is the first French course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-447** **Advanced French II**  
This course emphasizes active spoken language use. Other skills will also be used, such as reading, writing and listening, but primarily as helps for developing conversational ability. Attention will also be given to grammatical accuracy in conversation. By the end of this course, with consistent effort and attendance, the student should be able to communicate about topics routinely encountered in Francophone cultures. Part of the French language/culture concentration; the French language minor; may also be taken as an elective. (0525-446 or equivalent; see instructor for placement into appropriate course if this is the first French course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-448** **Advanced French III**  
This course emphasizes active spoken language use. Other skills will also be used, such as reading, writing and listening, but primarily as helps for developing conversational ability. Attention will also be given to grammatical accuracy in conversation. By the end of this course, with consistent effort and attendance, the student should be able to communicate about topics routinely encountered in Francophone cultures. Part of the French language/culture concentration; the French language minor may also be taken as an elective. (0525-447 or equivalent; see instructor for placement into appropriate course if this is the first French course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-459** **Special Topics: French**  
Study of a topic or area in one of the foreign languages or cultures not normally offered in any other concentration or minor course. May be part of a foreign language/culture concentration or minor; may be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0525-460** **Beginning German I**  
Beginning German I is the first course in a three-course sequence. The sequence provides students without prior exposure to the language with a sound basis for learning German as it is spoken and written today. The goal of the sequence is proficiency in communication skills, with an emphasis on oral proficiency. The sequence also acquaints students with contemporary culture and life in German-speaking countries. This course may be taken as the prerequisite for the German language/culture concentration; the German language/culture and German language minors; may be taken as an elective or for arts of expression credit. **Class 4, Credit 4 (offered regularly)**

**0525-461** **Beginning German II**  
Beginning German II is the second course in a three-course sequence. The sequence provides students without prior exposure to the language with a sound basis for learning German as it is spoken and written today. The goal of the sequence is proficiency in communication skills with an emphasis on oral proficiency. The sequence also acquaints students with contemporary culture and life in German-speaking countries. Part of the German language/culture concentration; the German language/culture and German language minors; may also be taken as an elective. (0525-460 or equivalent; see instructor for placement into appropriate course if this is the first German course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-462** **Beginning German III**  
Beginning German III is the third course in a three-course sequence. The sequence provides students without prior exposure to the language with a sound basis for learning German as it is spoken and written today. The goal of the sequence is proficiency in communication skills with an emphasis on oral proficiency. The sequence also acquaints students with contemporary culture and life in the German-speaking countries. Part of the German language/culture concentration; the German language/culture and the German language minors; may also be taken as an elective. (0525-461 or equivalent; see instructor for placement into appropriate course if this is the first German course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-463** **Intermediate German I**  
Intermediate German I is the first course of a three-course sequence at the intermediate level. This sequence provides students with the tools necessary to increase their ability to function in German. Communicative activities, contemporary texts, vocabulary study and grammar are used to expand all communication skills, especially oral proficiency. Required course for international business majors concentrating in German; part of the German language/culture concentration; the German language/culture and German language minors; may also be taken as an elective. (One year of college-level German or its equivalent; 0525-462 or equivalent; see instructor for placement into appropriate course if this is the first German course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-464** **Intermediate German II**  
Intermediate German II is the second course of a three-course sequence at the intermediate level. This sequence provides students with the tools necessary to increase their ability to function in German. Communicative activities, contemporary texts, vocabulary study and grammar are used to expand all communication skills, especially oral proficiency. Required course for international business majors concentrating in German; part of the German language/culture concentration; the German language/culture and German language minors; may also be taken as an elective. (0525-463 or equivalent; see instructor for placement into appropriate course if this is the first German course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-465** **Intermediate German III**  
Intermediate German III is the third course in a three-course sequence at the intermediate level. This sequence provides students with the tools necessary to increase their ability to function in German. Communicative activities, contemporary texts, vocabulary study and grammar are used to expand all communication skills, especially oral proficiency. Required course for international business majors concentrating in German; part of the German language/culture concentration; the German language/culture and German language minors; may also be taken as an elective. (0525-464 or equivalent; see instructor for placement into appropriate course if this is the first German course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-466** **Advanced German I**  
This course is the first course of the three-course sequence at the advanced level. It provides advanced students of German with the tools necessary to refine their speaking, writing, reading and listening skills. The course includes a study of advanced grammar. Literary and non-literary texts will be read and analyzed. Part of the German language/culture concentration; the German language/culture and German language minors; may also be taken as an elective. (0525-465 or equivalent; see instructor for placement into appropriate course if this is the first German course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-467** **Advanced German II**  
This course is the second course of the three-course sequence at the advanced level. It provides advanced students of German with the tools necessary to refine their speaking, writing, reading and listening skills. The course includes a study of advanced grammar. Literary and non-literary texts will be read and analyzed. Part of the German language/culture concentration; the German language/culture and German language minor; may also be taken as an elective. (0525-466 or equivalent; see instructor for placement into appropriate course if this is the first German course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-468** **Advanced German III**  
This course is the last course of the three-course sequence at the advanced level. It provides students of German with the tools necessary to refine their speaking, listening, reading and writing skills. The course includes a study of advanced grammar. Literary and non-literary texts will be read and discussed. A study of the contemporary German-speaking world is included. Part of the German language/culture concentration; the German language/culture and German language minors; may also be taken as an elective. (0525-467 or equivalent; see instructor for placement into appropriate course if this is the first German course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-479** **Special Topics: German**  
Study of a topic or area in one of the foreign languages or cultures not normally offered in any other concentration or minor course. May be part of a foreign language/culture concentration or minor; may be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0525-480** **Beginning Japanese I**  
This is the first course in the first-year sequence designed for students with no prior exposure to Japanese. It provides a sound introduction to the language as it is spoken and written today. A strong emphasis is placed on oral proficiency and the appropriate use of language in Japanese society. Hiragana syllabaries are also taught for written communication. The course is a prerequisite for the Japanese language/culture concentration; the Japanese language and Japanese language/culture minors; may be taken as an elective or for arts of expression credit. It is also a prerequisite for the KIT/RIT summer program in Kanazawa, Japan. Not open to students with prior Japanese instruction. See instructor for placement. **Class 4, Credit 4 (offered regularly)**

**0525-481** **Beginning Japanese II**  
This is the second course in the first-year sequence. It provides a sound introduction to the language as it is spoken and written today. A strong emphasis is placed on proficiency and the appropriate use of language in Japanese society. Students continue to learn how to use language in real-life situations for different communication purposes. Katakana and Kanji characters are also introduced for written communication. The course is a prerequisite for the KIT/RIT summer program in Kanazawa, Japan. Part of the Japanese language/culture concentration; the Japanese language/culture and Japanese language minors; may also be taken as an elective. Students must know Hiragana to take this course. (0525-480 or equivalent; see instructor for placement into appropriate course if this is the first Japanese course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-482** **Beginning Japanese III**  
This is the third course in the first-year sequence. It provides a sound introduction to the language as it is spoken and written today. A strong emphasis is placed on proficiency and the appropriate use of language in Japanese society. Students continue to learn how to use language in real-life situations for different communication purposes. In addition to Hiragana and Katakana syllabaries, students learn approximately 50 Kanji in this course. The course is a prerequisite for the KIT/RIT summer program in Kanazawa, Japan. Part of the Japanese language/culture concentration; the Japanese language/culture and Japanese language minors; may also be taken as an elective. (0525-481 or equivalent; see instructor for placement into appropriate course if this is the first Japanese course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-483** **Intermediate Japanese I**  
This is the first course in the second-year sequence designed to give students more advanced instruction and practice in the skills of speaking, reading, writing and comprehending contemporary Japanese. A strong emphasis is placed on proficiency through reading, writing and speaking activities. Students learn cultural information and practice using the language in real-life situations in Japanese society. Approximately 80 new Kanji are introduced. The course is a prerequisite for the KIT/RIT summer program in Kanazawa, Japan. Part of the Japanese language/culture concentration; the Japanese language/culture and Japanese language minors; may also be taken as an elective. (0525-482 or equivalent; see instructor for placement into appropriate course if this is the first Japanese course at RIT) **Class 4, Credit 4 (offered twice annually)**

**0525-484 Intermediate Japanese II**  
This is the second course in the second-year sequence designed to give students more advanced instruction and practice in the skills of speaking, reading, writing and comprehending contemporary Japanese. A strong emphasis is placed on proficiency. Through reading, writing and speaking activities students learn cultural information and practice using the language in real-life situations in Japanese society. Approximately 90 new Kanji are introduced. The course is a prerequisite for the KIT/RIT summer program in Kanazawa, Japan. Part of the Japanese language/culture concentration; the Japanese language/culture and Japanese language minors; may also be taken as an elective. (0525-483 or equivalent; see instructor for placement into appropriate course if this is the first Japanese course at RIT) **Class 4, Credit 4 (offered twice annually)**

**0525-485 Intermediate Japanese III**  
This is the third course in the second-year sequence designed to give students more advanced instruction and practice in the skills of speaking, reading, writing and comprehending contemporary Japanese. A strong emphasis is placed on proficiency through reading, writing and speaking activities. Students learn cultural information and practice using the language in real-life situations in Japanese society. Approximately 90 new Kanji are introduced. Part of the Japanese language/culture concentration; the Japanese language/culture and Japanese language minors; may also be taken as an elective. (0525-484 or equivalent; see instructor for placement into appropriate course if this is the first Japanese course at RIT) **Class 4, Credit 4 (offered twice annually)**

**0525-486 Advanced Japanese I**  
This course provides advanced students of Japanese with training in all four language skills. Students will practice oral communication with a high degree of proficiency in various social settings. They will improve communicative skills with discussions and debates. They also receive training in reading semi-authentic materials with the help of a dictionary and in writing for a specific purpose, such as news reports and critical essays. Part of the Japanese language/culture concentration; the Japanese language minors; may also be taken as an elective. (0525-485 or equivalent; see instructor for placement into appropriate course if this is the first Japanese course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-487 Advanced Japanese II**  
This course provides advanced students of Japanese with training in all four language skills. Continuing Advanced Japanese I students will practice oral communication with a high degree of proficiency in various social settings. They will improve communicative skills with discussions and debates. Students will also receive training in reading semi-authentic materials with the help of a dictionary and in writing for a specific purpose, such as news reports and critical essays. Part of the Japanese language/culture concentration; the Japanese language/culture and Japanese language minors; may also be taken as an elective. (0525-486 or equivalent; see instructor for placement into appropriate course if this is the first Japanese course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-488 Advanced Japanese III**  
This course provides advanced students of Japanese with training in all four language skills. Students will practice oral communication with a high degree of proficiency in various social settings. They will improve communicative skills with discussions and debate. They will also receive training in reading semi-authentic and authentic materials with the help of a dictionary as well as training in writing for a specific purpose, such as news reports and critical essays. Part of the Japanese language/culture concentration; the Japanese language/culture and Japanese language minors; may also be taken as an elective. (0525-487 or equivalent; see instructor for placement into appropriate course if this is the first Japanese course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-496 Structure of Japanese Language**  
This course aims to increase students' understanding of basic characteristics of the Japanese language, which will help their learning of the language. The topics include the genetic affiliation of the Japanese language, sound system, word formation, syntactic structures, sociocultural factors in language use and historical development of the writing system. Students will become acquainted with the language from a linguistics perspective and develop analytical skills by solving linguistic problems pertinent to Japanese language. Part of the Japanese language/culture concentration; the Japanese language/culture minor; may also be taken as an elective. (0525-480 or equivalent) **Class 4, Credit 4 (offered annually)**

**0525-497 Languages in Japanese Society**  
This course aims to introduce students to modern Japanese society, its rich cultural heritage and the use of Japanese language that reflects the societal norms. It provides students with a fundamental yet diverse knowledge of Japanese culture and Japanese language use. The course work will include lectures, readings, discussions and work with multi-media resources. No prerequisites. Knowledge of Japanese helpful but not necessary. Part of the Japanese language/culture concentration; the Japanese language/culture minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0525-500 Beginning Italian I**  
Beginning Italian I is the first course in a three-course sequence. The sequence provides students without prior knowledge of the language with a sound basis for learning Italian as it is spoken and written today. The goal of the sequence is proficiency in communication skills with an emphasis on oral proficiency. The sequence also acquaints students with contemporary culture and life in Italy. This course may be taken as the prerequisite for the Italian concentration and minors; may be taken as an elective or for arts of expression credit. **Class 4, Credit 4 (offered annually)**

**0525-501 Beginning Italian II**  
Beginning Italian II is the second course in a three-course sequence. The course provides students with Beginning Italian I or an equivalent foundation with further learning in Italian as it is spoken and written today. The goal of the sequence is proficiency in communication skills with an emphasis on oral proficiency. Students study contemporary culture and life in Italy. Part of the Italian language/culture concentration; the Italian language/culture and Italian language minors; may also be taken as an elective. (0525-500 or equivalent; see instructor for placement into appropriate course if this is the first Italian course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-502 Beginning Italian III**  
Beginning Italian III is the third course in a three-course sequence. The course provides students with Beginning Italian II or an equivalent foundation with further learning in Italian as it is spoken and written today. The goal of the sequence is proficiency in communication skills with an emphasis on oral proficiency. Students also study contemporary life and culture in Italy. Part of the Italian language/culture concentration; the Italian language/culture and Italian language minors; may also be taken as an elective. (0525-501 or equivalent; see instructor for placement into appropriate course if this is the first Italian course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-503 Intermediate Italian I**  
Intermediate Italian I is the first course of a three-course sequence at the intermediate level. The prerequisite is one year of college-level Italian or its equivalent. This sequence provides students with the tools necessary to increase their ability to function in Italian. Communication activities, contemporary texts, vocabulary study and grammar are used to expand all communication skills, especially oral proficiency. Written and oral communication enforce the use of language in formal/professional settings. Part of the Italian language/culture concentration; the Italian language/culture and Italian language minors; may also be taken as an elective. (0525-502 or equivalent; see instructor for placement into appropriate course if this is the first Italian course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-504 Intermediate Italian II**  
Intermediate Italian II is the second course of a three-course sequence at the intermediate level. This sequence provides students with the tools necessary to increase their ability to function in Italian. Communication activities, contemporary texts, vocabulary study and grammar are used to expand all communication skills, especially oral proficiency. Written and oral communication enforce the use of language in formal/professional settings. Part of the Italian language/culture concentration; the Italian language/culture and Italian language minors; may also be taken as an elective. (0525-503 or equivalent; see instructor for placement into appropriate course if this is the first Italian course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-505 Intermediate Italian III**  
Intermediate Italian III is the final course of a three-course sequence at the intermediate level. This sequence provides students with the tools necessary to increase their ability to function in Italian. Communication activities, contemporary texts, vocabulary study and grammar are used to expand all communication skills, especially oral proficiency. Written and oral communication enforce the use of language in formal/professional settings. Part of the Italian language/culture concentration; the Italian language/culture and Italian language minors; may also be taken as an elective. (0525-504 or equivalent; see instructor for placement into appropriate course if this is the first Italian course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-506** **Advanced Italian I**  
This is the first course of a three-course sequence at the advanced level. This sequence is designed to further develop proficiency in the four language skills of listening, speaking, reading and writing. This sequence develops the ability to understand and communicate more freely by expansion of vocabulary and grammar; by exposure to authentic cultural materials, both textual and visual; and by discussions, compositions and oral reports based on cultural and library texts. The course seeks to analyze contemporary Italian culture, politics and economics through its representation in films and the press. Students are required to analyze, form opinions and participate in discussions. Students will pursue a research topic of their choice and submit a portfolio at the end. Part of the Italian concentration and minors; may also be taken as an elective. (0525-505 or equivalent) **Class 4, Credit 4 (offered regularly)**

**0525-507** **Advanced Italian II**  
This is the second course of a three-course sequence at the advanced level. This sequence is designed to further develop proficiency in the four language skills of listening, speaking, reading and writing. This sequence develops the ability to understand and communicate more freely by expansion of vocabulary and grammar, by exposure to authentic cultural materials, both textual and visual; and by discussions, compositions and oral reports based on cultural and literary texts. The course seeks to analyze contemporary Italian culture, politics and economics through films and the press. Major trends examined include youth, education, immigration, women and the political system. Students will pursue a research topic of their choice and submit a portfolio at the end. Part of the Italian concentration and minors; may also be taken as an elective. (0525-506 or equivalent; see instructor for placement into appropriate course if this is the first Italian course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-508** **Advanced Italian III**  
This is the third course of a three-course sequence at the advanced level. This sequence is designed to further develop proficiency in the four language skills of listening, speaking, reading and writing. This sequence develops the ability to understand and communicate more freely by expansion of vocabulary and grammar; by exposure to authentic cultural materials, both textual and visual; and by discussions, compositions, and oral reports, based on cultural and literary texts. The course seeks to analyze contemporary Italian culture, politics and economics through films and the press. Major trends examined include youth, education, immigration, women and the political system. Students will pursue a research topic of their choice and submit a portfolio at the end. (0525-507 or equivalent; see instructor for placement into appropriate course if this is the first Italian course at RIT) Part of the Italian concentration and minors; may be taken as an elective. **Class 4 Credit 4 (offered regularly)**

**0525-519** **Special Topics: Italian**  
Study of a topic or area in one of the foreign languages or cultures not normally offered in any other concentration or minor course. May be part of a foreign language/culture concentration or minor; may be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0525-520** **Beginning Portuguese I**  
Beginning Portuguese I builds the foundation skills in speaking, listening, reading, writing and culture, with emphasis on conversation. For students with no prior experience in the language; may be taken as an elective or for arts of expression credit. Permission of world languages coordinator is required for registration. **Class 4, Credit 4 (offered regularly)**

**0525-521** **Beginning Portuguese II**  
Beginning Portuguese II is the second course in the beginning year of Portuguese. This course continues presentation of work in the basic skills of speaking, listening, reading, writing and culture, including work on past tenses. Emphasis is conversation. Part of the Latino/Latina/Latin American concentration; may also be taken as an elective. (0525-520 or equivalent proficiency) See world languages coordinator if this is your first RIT Portuguese course. **Class 3, Credit 4 (offered regularly)**

**0525-522** **Beginning Portuguese III**  
Beginning Portuguese III is the third course in the beginning year of Portuguese. This course advances work in the basic skills of speaking, listening, reading, writing and culture, including work on the subjunctive mood. Emphasis is on conversation. Longer passages will be practiced in all skills. Part of the Latino/Latina/Latin American concentration may also be taken as an elective. (0525-521 or equivalent) See world languages coordinator if this is your first RIT Portuguese course. **Class 3, Credit 4 (offered regularly)**

**0525-523** **Intermediate Portuguese I**  
Intermediate Portuguese I is the first course in the second year, intermediate-level Portuguese. This course includes intensive grammar review along with increasing work in conversation, composition and culture. Intensive practice in all skills (speaking, listening, reading, writing, culture), especially situation dialogues. Part of the Latino/Latina/Latin American concentration; may also be taken as an elective. See world languages coordinator if this is your first RIT Portuguese course. (0525-522 or equivalent) **Class 3, Credit 4 (offered regularly)**

**0525-524** **Intermediate Portuguese II**  
Intermediate Portuguese II is the second course in second-year, intermediate-level Portuguese. This course continues intensive grammar review along with intensive work in conversation, composition and culture, with work in all skills. Includes work on business letters and situation dialogues. Part of the Latino/Latina/Latin American concentration; may also be taken as an elective. See world languages coordinator if this is your first RIT Portuguese course. (0525-523 or equivalent) **Class 3, Credit 4 (offered regularly)**

**0525-525** **Intermediate Portuguese III**  
Intermediate Portuguese III is the third course in second-year, intermediate-level Portuguese. This course includes intensive work in conversation, composition and culture, including authentic materials and longer readings. Part of the Latino/Latina/Latin American concentration; may also be taken as an elective. See world languages coordinator if this is your first RIT Portuguese course. (0525-524 or equivalent proficiency) **Class 3, Credit 4 (offered regularly)**

**0525-526** **Advanced Portuguese I**  
This is the first in a three-course sequence at the advanced level in Portuguese. The course will help to further develop proficiency at the advanced level in all skills of the language (speaking, listening, reading, writing, culture). Students will increase their ability to communicate and to understand the language and culture of Portuguese-speaking countries through intensive study of grammar and vocabulary, reading of literary selections and discussion of the culture. Part of the Latina/Latino/Latin American concentration; may also be taken as an elective. See world languages coordinator if this is your first RIT Portuguese course. (0525-525 or equivalent) **Class 3, Credit 4 (offered regularly)**

**0525-527** **Advanced Portuguese II**  
This is the second in a three-course sequence at the advanced level in Portuguese. The course will help to further develop proficiency at the advanced level in all skills of the language (speaking, listening, reading, writing, culture). Students will increase their ability to communicate and to understand the language and culture of Portuguese-speaking countries through intensive study of grammar and vocabulary, reading of literary selections and discussion of culture. Part of the Latina/Latino/Latin American concentration; may also be taken as an elective. See world languages coordinator if this is your first RIT Portuguese course. (0525-526 or equivalent) **Class 3, Credit 4 (offered regularly)**

**0525-528** **Advanced Portuguese III**  
This is the third in a three-course sequence at the advanced level in Portuguese. The course will help to further develop proficiency at the advanced level in all skills of the language (speaking, listening, reading, writing, culture). Students will increase their ability to communicate and to understand the language and culture of Portuguese-speaking countries through intensive study of grammar and vocabulary, study of contemporary Brazilian theater, and discussion of culture. Part of the Latino/Latina/Latin American concentration; may also be taken as an elective. See world languages coordinator if this is your first RIT Portuguese course. (0525-527 or equivalent) **Class 3, Credit 4 (offered regularly)**

**0525-539** **Special Topics: Portuguese**  
Study of a topic or area in one of the foreign languages or cultures not normally offered in any other concentration or minor course. May be part of a foreign language/culture concentration or minor; may be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0525-540** **Beginning Russian I**  
Beginning Russian I builds the foundation skills in speaking, listening, reading, writing and culture, with emphasis on conversation. For students with no prior experience in the language. Beginning Russian I or equivalent is the prerequisite for the Russian language/culture concentration and Russian language and Russian language/culture minors; may also be taken as an elective or for arts of expression credit. Permission of world languages coordinator required. **Class 3, Credit 4 (offered regularly)**



**0525-541** **Beginning Russian II**  
Beginning Russian II focuses on the development of functional competence in speaking, listening, reading, writing and culture, with emphasis on conversation. Part of the Russian language/culture concentration; Russian language and Russian language/culture minors; may also be taken as an elective. See world languages coordinator if this is your first RIT Russian course. **Class 3, Credit 4 (offered regularly)**

**0525-542** **Beginning Russian III**  
Beginning Russian III works on further development of functional skills in speaking, listening, reading, writing and culture, with emphasis on conversation. Part of the Russian language/culture concentration; Russian language and Russian language/culture minors; may also be taken as an elective. See world languages coordinator if this is your first RIT Russian course. **Class 3, Credit 4 (offered regularly)**

**0525-543** **Intermediate Russian I**  
Intermediate Russian I continues with intermediate-level development of functional skills in speaking, listening, reading, writing and culture, with emphasis on conversation. Part of the Russian language/culture concentration; Russian language and Russian language/culture minors; may also be taken as an elective. See world languages coordinator if this is your first RIT Russian course. **Class 3, Credit 4 (offered regularly)**

**0525-544** **Intermediate Russian II**  
Intermediate Russian II continues with more intermediate-level work in all skills (speaking, listening, reading, writing and culture). Part of the Russian language/culture concentration; Russian language and Russian language/culture minors; may also be taken as an elective. See world languages coordinator if this is your first RIT Russian course. **Class 3, Credit 4 (offered regularly)**

**0525-545** **Intermediate Russian III**  
Intermediate Russian III, last course in the intermediate sequence in Russian language, does advanced-, intermediate-level work in all skills. Part of the Russian language/culture concentration; Russian language and Russian language/culture minors; may also be taken as an elective. See world languages coordinator if this is your first RIT Russian course. **Class 3, Credit 4 (offered regularly)**

**0525-546** **Advanced Russian I**  
This is the first in a three-course sequence at the advanced level in Russian. The course will help to further develop proficiency at the advanced level in all skills of the language (speaking, listening, reading, writing, culture). Students will increase their ability to communicate and to understand the language and culture of Russian-speaking countries through intensive study of grammar and vocabulary, introduction to literature, and discussion of culture. Part of the Russian language/culture concentration; Russian language and Russian language/culture minors; may also be taken as an elective. See world languages coordinator if this is your first RIT Russian course. (0525-545 or equivalent proficiency) **Class 3, Credit 4 (offered regularly)**

**0525-547** **Advanced Russian II**  
This is the second in a three-course sequence at the advanced level in Russian and meets as a regular class plus language lab. The course will help to further develop proficiency at the advanced level in all skills of the language (speaking, listening, reading, writing, culture). Students will increase their ability to communicate and to understand the language and culture of Russian-speaking countries through intensive study of grammar and vocabulary, reading selected literature and nonfiction prose, and discussion of culture. Part of the Russian language/culture concentration; Russian language and Russian language/culture minors; may also be taken as an elective. See world languages coordinator if this is your first RIT Russian course. (0525-546 or equivalent proficiency) **Class 3, Credit 4 (offered regularly)**

**0525-548** **Advanced Russian III**  
This is the third in a three-course sequence at the advanced level in Russian and meets as a regular class plus language lab. The course will help to further develop proficiency at the advanced level in all skills of the language (speaking, listening, reading, writing, culture). Students will increase their ability to communicate and to understand the language and culture of Russian-speaking countries through intensive study of grammar and vocabulary, reading of literature and nonfiction prose, and discussion of culture. Part of the Russian language/culture concentration; Russian language and Russian language/culture minors; may also be taken as an elective. See world languages coordinator if this is your first RIT Russian course. (0525-547 or equivalent proficiency) **Class 3, Credit 4 (offered regularly)**

**0525-559** **Special Topics: Russian**  
Study of a topic or area in one of the foreign languages or cultures not normally offered in any other concentration or minor course. May be part of a foreign language/culture concentration or minor; may be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0525-560** **Beginning Spanish I**  
Beginning Spanish I is the first course in a three-course sequence. This sequence of courses provides students with a basic foundation in all skills in Spanish (speaking, listening, reading, writing, culture) through intensive practice in a variety of media. Course I is for true beginners, and it (or an equivalent proficiency) is a prerequisite for courses II and III. This course may be taken as the prerequisite for the Spanish language/culture concentration and the Spanish language/culture and Spanish language minors; may be taken as an elective or for arts of expression credit. See instructor for placement in the appropriate course. **Class 4, Credit 4 (offered regularly)**

**0525-561** **Beginning Spanish II**  
This is the second course in the beginning Spanish sequence, continuing through the basic language structures, vocabulary, situations and emphasis on past tenses. Part of the Spanish language/culture and Latino/Latina/Latin American concentrations; the Spanish language/culture and Spanish language minors; may also be taken as an elective. (0525-560 or equivalent; see instructor for placement into appropriate course if this is the first Spanish course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-562** **Beginning Spanish III**  
This is the third course in the beginning Spanish sequence, continuing through the basic structures, vocabulary and situations, and expanding practice in all skills. Emphasis on the subjunctive mood. Part of the Spanish language/culture and Latino/Latina/Latin American concentrations; the Spanish language/culture and Spanish language minors; may also be taken as an elective. (0525-561 or equivalent; see instructor for placement into appropriate course if this is the first Spanish course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-563** **Intermediate Spanish I**  
This is the first course in the intermediate Spanish sequence. Intermediate I (Fall) emphasizes tourist survival situation dialogues, grammar review and culture. The intermediate courses continue the study of Spanish on a more advanced level and include intensive work on speaking, writing, reading, listening and culture. The basic skills learned previously are now put into practice. Part of the Spanish concentration; the Latino/Latina/Latin American Concentration, and the Spanish language/culture and Spanish language minors; may also be taken as an elective. Required course for international business students concentrating in Spanish. (0525-562 or equivalent; see instructor for placement into appropriate course if this is the first Spanish course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-564** **Intermediate Spanish II**  
This is the second course in the intermediate Spanish sequence. Intermediate II (Winter) emphasizes professional vocabulary in the student's major field of study, business correspondence (letters), grammar review and culture. The intermediate courses continue the study of Spanish on a more advanced level and include intensive work in speaking, writing, reading, listening and culture. The basic skills learned previously are now put into practice. Part of the Spanish language/culture and Latino/Latina/Latin American concentrations; the Spanish language/culture and Spanish language minors; may also be taken as an elective. Required course for international business majors concentrating in Spanish. (0525-563 or equivalent; see instructor for placement into appropriate course if this is the first Spanish course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-565** **Intermediate Spanish III**  
This is the third course in the intermediate Spanish sequence. Intermediate III (Spring) emphasizes conversation and composition along with grammar review and culture. The intermediate courses continue the study of Spanish on a more advanced level and include intensive work in speaking, listening, writing, reading and culture. The basic skills learned previously are now put into practice. Part of the Spanish language/culture and Latino/Latina/Latin American concentrations; the Spanish language/culture and Spanish language minors; may also be taken as an elective. (0525-564 or equivalent; see instructor for placement into appropriate course if this is the first Spanish course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-566** **Advanced Spanish I**  
This is the first third-year course for advanced students of Spanish. It is designed to develop the student's proficiency in the Spanish language in listening, reading, speaking and writing. The student will expand his or her vocabulary and knowledge of the Hispanic world through exposure to authentic texts (literary and non-literary) and films. He or she will also study grammar, punctuation and accentuation in order to improve his or her writing skills. By the end of the quarter, the student will have a good understanding of the structure of the language, including many of its intricacies. This knowledge will facilitate oral and written self-expression. (0525-565 or equivalent; see instructor for placement into appropriate course if this is the first Spanish course at RIT) **Class 4, Credit 4 (offered regularly)**

**0525-567** **Advanced Spanish II**  
This is the second third-year course for advanced students of Spanish. It is designed to further develop the student's proficiency in the Spanish language in listening, reading, speaking and writing. The student will expand his or her vocabulary and knowledge of the Hispanic world through exposure to authentic texts (literary and non-literary) and films. He or she will also study grammar, punctuation and accentuation in order to improve his or her writing skills. By the end of the quarter, the student will have a good understanding of the structure of the language, including many of its intricacies. This knowledge will facilitate oral and written self-expression. (0525-565 or equivalent; see instructor for placement into appropriate course if this is the first Spanish course at RIT) **Class 4, Credit 4 (W)**

**0525-568** **Advanced Spanish III**  
This is the final third-year course for advanced students of Spanish. It is designed to further develop the student's proficiency in the Spanish language in listening, reading, speaking and writing. The student will expand his or her vocabulary and knowledge of the Hispanic world through exposure to authentic texts (literary and non-literary) and films. He or she will also study grammar, punctuation and accentuation in order to improve his or her writing skills. By the end of the quarter, the student will have a good understanding of the structure of the language, including many of its intricacies. This knowledge will facilitate oral and written self-expression. (0525-566 or equivalent; see instructor for placement into appropriate course if this is the first Spanish course at RIT) **Class 4, Credit 4 (S)**

**0525-578** **Women in the Hispanic World: The Politics of Identity Formation**  
This course is an exploration of the contributions to the history and culture of Spanish America by women. We will study the lives and works of women from different centuries and nationalities: Sor Juana Inés de la Cruz (17th century Mexico); Clorinda Matto de Turner (19th century Peru); Frida Kahlo (20th century Mexico); Gabriela Mistral (20th century Chile); Eva "Evita" Perón (20th century Argentina); Celia Cruz (20th century Cuba); and the Mothers of the Plaza de Mayo (20th century Argentina), among others. The impact of these women in the fields of poetry, narrative, painting, music and politics will be analyzed. **Class 4, Credit 4 (offered annually)**

**0525-579** **Special Topics: Spanish**  
Study of a topic or area in one of the foreign languages or cultures not normally offered in any other concentration or minor course. May be part of a foreign language/culture concentration or minor; may be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

## Urban and Community Studies

**0526-440** **Quantitative Methods**  
The research conducted by sociologists and anthropologists generates large, complex data sets that are difficult to interpret subjectively. Multivariate quantitative methods are an important tool for the interpretation of the data. This course presents a variety of quantitative methods for the analysis of large population data set in the context of sociological and anthropological reach. Topics include research design, collecting and coding data, screening data, data display, non-metric data, comparing groups, exploratory data analysis, and classification and grouping. The course features laboratory exercises in which the methodologies are applied to actual data sets and an individual final project in which the student selects a research problem and data set that they analyze and present to the class. (Data Analysis I and II) **Class 4, Credit 4 (offered annually)**

**0526-441** **GIS Applications in Urban and Community Studies**  
This course will examine GIS applications in urban and community studies such as spatial analysis at individual and household levels, spatial analysis of ethnic neighborhoods with census data, as well as spatial perspectives and analytical frameworks in urban research and the role of spatial analysis in demographic research. This course includes an introduction to GIS technology where in-class lab projects are designed to teach the student to assess spatial and temporal data in solving urban and community planning problems. (Data Analysis I and II and Cultural Anthropology or Foundations of Sociology) **Class 4, Credit 4 (offered annually)**

**0526-442** **Social Order of the City**  
This course studies the major constituents of urban social organization, such as city governance bodies, business communities, community organizations and organized labor, and how these parts interact to define and make the major decisions cities face. These decisions concern such issues as land use, city budget, urban-suburban relations and quality of city life. The social organization of the city is also understood within the wider state, national and global contexts. This course may be used as an elective for the urban and community studies degree program; part of the sociology concentration; as a general education elective or as a free elective. (0510-210, 0515-210 or equivalent) **Class 4, Credit 4 (offered annually)**

**0526-443** **People, Politics and Planning**  
The City of Rochester will serve as a laboratory for perspectives and insights in the sociology and anthropology of urban and community studies. Students will observe and assess the workings of the city's social order within various historical and social contexts. The course will examine the industrial transformation of this city, the diversity of its major population groups and the dynamics of their interrelations, and the city's past and present process of policy formation. This course may be used as an elective for the urban and community studies degree program; part of the sociology concentration; as a general education elective or as a free elective. (0510-210, 0515-210 or equivalent) **Class 4, Credit 4 (offered annually)**

**0526-444** **City and Countryside**  
Cities cannot exist in isolation but depend upon rural areas for food, natural resources, labor, housing and recreation. Drawing upon examples from the U.S. and the developing world, this course examines the mutual dependencies and flows between city and countryside and the social and cultural consequences of these interactions. The course considers the implications for rural-urban dynamics of specific trends such as the mechanization of agriculture, export-oriented agriculture, offshore manufacturing, free-trade agreements, circular migration, tourism, immigration policy and international labor migration. This course may be used as an elective in the urban and community studies degree program; as part of the sociology concentration and as a free elective. (0510-210, 0515-210 or equivalent) **Class 4, Credit 4 (offered annually)**

**0526-475** **Senior Thesis in Urban and Community Studies**  
The senior thesis is the final requirement in the urban and community studies degree program. Students will conduct and present research on a selected major issue in the field of urban and community studies. The course will provide students the opportunity to develop skills of expressing their research in written and oral forms. The completed written thesis will be presented to the department faculty and then orally defended before a committee of three department faculty members. This is a required course for seniors in the urban and community studies degree program. It may be taken by students in any liberal arts degree program with interest in urban and community studies and who satisfy the prerequisites. (0515-442, 0515-406 and 0526-440) **Class 4, Credit 4 (offered twice annually)**

## Material Cultural Science

**0531-437** **Forensic Investigation of Art**  
This course introduces the study and examination of artistic and historic materials within a humanities-oriented forum in which students present and debate published research on several famous case studies, including the Shroud of Turin, the Getty Kouros, and the Han van Meegeren forgeries of Vermeer paintings. Emphasis will be on using resources from the interdisciplinary fields of art history, art and material science supported by a virtual lab in which the application of instrumental techniques to the materials is demonstrated. Part of the material culture science concentration; may be taken as an elective. Cross-listed with 0505-437. No prerequisite. **Class 4, Credit 4 (offered annually)**

**0531-438 Introduction to Art Conservation**  
This course examines the philosophies, ethics, art conservation methods and principles of collection management. An overview of deterioration characteristics and conservation strategies for a variety of materials including stone, glass, ceramic, wood, paper, new media, metals, textiles, oil paintings and archaeological materials will be presented. Part of the material culture science concentration; may be taken as an elective. Cross-listed with 0505-438. No prerequisite. **Credit 4, Class 4 (offered annually).**

**0531-441 GIS Applications in Urban and Community**  
This course will examine GIS applications in urban and community studies such as spatial analysis at individual and household levels and spatial analysis of ethnic neighborhoods with census data as well as spatial perspectives and analytical frameworks in urban research and the role of spatial analysis in demographic research. This course includes an introduction to GIS technology where in-class lab projects are designed to teach the student to assess spatial and temporal data in solving urban and community planning problems. Part of the material culture science concentration; may be taken as an elective. Cross-listed with 0526-441. (Data analysis I and II and either Cultural Anthropology or Foundations of Sociology) **Class 4, Credit 4 (offered annually)**

**0531-444 Survey of Metallurgy**  
This course introduces students to the anthropological study of metallurgy. The course begins with a survey of the earliest uses of metals and examines some of the early metallurgical treatises. Using archaeologically derived and modern data, we will explore ancient and current mining and extraction techniques. We will also explore the meanings of metallurgical processes as presented in ethnographic accounts. Using information and data derived from scientific inquiry, archaeological excavations and ethnographies, we will examine basic metal refining and working techniques. Students will also learn to interpret phase diagrams and study microstructures of metal samples. Part of the material culture science and archaeology concentrations; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0531-445 Field Methods in Archaeology**  
This course introduces students to the methods of archaeological field work. The course begins with the student's development of a research question and design. We then explore the feasibility of this research through the examination of sampling techniques, site survey and excavation. Field methods of recording, photography and artifact conservation will also be discussed. Students will be able to analyze the usefulness of the field techniques in light of the archaeological scientific methods for dating and organic and inorganic analyses. Students should emerge from the course understanding the values of the techniques necessary for proper archaeological excavation towards the reconstruction of the past and the development of an understanding of our present. Part of the material culture science and archaeology concentrations; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0531-446 Native North Americans**  
The resilience of Native North Americans continues to amaze anthropologists and those who once proclaimed them certain for extinction. In what can now be acclaimed as a remarkable revival of dead Indians, these cultures are rich and thriving. They maintain their world views but in a drastically changed and contemporary setting. Many tribes own casinos, hotels, resorts and other successful businesses. Not only are the values and their heritage alive and well, they are quite successful in reviving the formerly outlawed traditions of the past such as the potlatch, medicine lodge and ghost dance. This course is taught from a Native American perspective and addresses both past and current issues that affect the culture, heritage and tribal sovereignty. Part of the material culture science concentration; may be taken as an elective. **Class 4, Credit 4**

**0531-448 Native Americans in Film**  
From visions of romantic fantasy to imagery of the barbaric and horrific, Native Americans have been misrepresented in film since the invention of motion pictures. Tonto, Pocahontas, Hiawatha, and how the West was won—how do you know what is real and what is imagined? This course examines the genre of Native American films and intends to critically analyze stereotypes, false imagery and how these have infatuated even the most educated of viewers. While anthropologists studied diligently among Native Americans, they too fed Hollywood the embellished images that dominate the big screen. We will identify the roles anthropologists have played in the emergence and correction of these Native American stereotypes. Part of material culture science concentration; may be taken as an elective. Cross-listed with 0510-448. **Class 4, Credit 4 (offered annually)**

**0531-502 Archaeology and the Human Past**  
Archaeology is the study of the human past, from the origin of our species through the development of modern, industrial states. In studying the past, archaeology seeks to explain how we as modern humans came to be. This course discusses how archaeologists study the past, explains how human society has changed over time and presents an overview of world prehistory, examining key developments in the human past. Specific topics will include the evolution of modern humans, the peopling of the world, the development of agriculture, the rise of states and the development of urban society. Case studies will be used throughout the course. Part of the archaeology concentration; may be used as an elective. Cross-listed with 0510-502. **Credit 4, Class 4 (offered annually)**

**0531-506 Great Discoveries in Archaeology**  
Archaeology conjures a romantic image in the minds of many people and almost everyone is at least familiar with some of the greatest discoveries made by archaeologists. Finds such as King Tut's tomb, the ancient city of Troy, the jungle cities of the Maya and Otzi the Ice Man excite almost anyone who hears of them. But what is it, aside from fabulous wealth, romantic locale or incredible preservation that makes them great? Although great discoveries are always exciting, archaeology is not only about finding things but also about using these findings to explain the human past. This course helps us understand how and why human society has changed over time. It explores some of the great discoveries of archaeology, many of which will be familiar to students. Part of the archaeology concentration; may be taken as an elective. Cross-listed with 0510-506. **Class 4, Credit 4 (offered annually)**

**0531-507 Archaeological Science**  
Archaeology is one of the few social sciences that lends itself well to the application of analytical techniques from the physical sciences. This is largely due to the fact that archaeology relies primarily on physical evidence. This course examines the growing field of archaeological science. It covers a number of archaeological questions, including the age and origin of materials; how things are made; what people ate; their daily activities; their state of health; and how archaeological scientists are able to answer these questions using techniques from biology, chemistry and physics. The course includes in-class labs in which students apply some of these techniques and a final research project in which they pick their own archaeological question and methodology to answer it. Part of the material culture science and archaeology concentrations; may be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0531-508 Archaeology of Cities**  
This course will focus on the prehistorical trajectories of urban development, the multiple roles of cities and their impact on the development of complex societies in different world regions. We will attempt to explain how, in its multiple forms and manifestations, the city has developed and contributed to the constitution of modern, industrial society. The course will consist of lectures, in-class discussions and activities, group presentations and a final research paper that will be presented to the class. Part of the material culture science and archaeology concentrations; may be taken as an elective. Cross-listed with 0510-508. **Class 4, Credit 4 (offered annually)**

## Communication

**0535-200 Foundations of Communication**  
An introduction to the theoretical and conceptual underpinnings of oral, visual and written communication. Introduces basic communication models, the role of language in communication, symbols and symbol making, issues of audience analysis and the development of different modes of discourse. Also explores the history of communication and introduces students to basic research in communication studies. Required course for communication and advertising and public relations majors only. **Class 4, Credit 4 (offered regularly)**

**0535-311 Rhetorical Theory**  
Analyzes rhetorical discourse as spoken, symbolic human action intending to influence the formation of public opinion and public policy. Various critical perspectives, including classical origins, modern rhetorical theorists and contemporary critical approaches, are applied to public discourse in the United States. Students have the opportunity to apply appropriate critical methods to selected historical and contemporary rhetoric from the American experience. Research and writing are stressed. Required course for communication majors; a professional elective for advertising and public relations majors. **Class 4, Credit 4 (offered occasionally)**

**0535-315** **Quantitative Research Methods**  
An introduction to the methods and ethics of scientific, scholarly communication research, including methods of locating, analyzing and critiquing communication research literature. Focuses on empirical methods and leads to the development of a research project proposal. Required course for communication and advertising and public relations majors only. (0535-200, 210, 445) **Class 4, Credit 4 (offered annually)**

**0535-316** **Qualitative Research Methods**  
Introduction to the methods and ethics of critical research, participant observation and focus group interviewing. Qualitative research methods rely on the researcher's observational, analytic and critical skills, and seek to understand the behaviors, beliefs, values, attitudes, assumptions, rituals and symbol systems that characterize relationships between the source, message, media and audience of specific communication acts. Students develop a research proposal suitable for implementation as their senior thesis in communication. Required course for advertising and public relations majors only. (0535-210, 445) **Class 4, Credit 4 (offered annually)**

**0535-317** **Critical Research Methods in Communication**  
An undergraduate course in the practice and methods of rhetorical criticism, with an emphasis on the working practices of critics of primarily oral, written and media texts. Students will design a formal, academic proposal for a scholarly research thesis in rhetorical criticism. Required course for professional and technical communication program and a professional elective for advertising and public relations program. (0535-200 and 0535-444) **Class 4, Credit 4 (offered annually)**

**0535-351** **Professional Communication for Software Engineers**  
An introduction to professional communication contexts and processes emphasizing both conceptual and practical dimensions. Participants engage in public speaking, small group problem solving and leadership, and professional writing exercises while acquiring theoretical background appropriate to understanding these skills. Service course for software engineers. No prerequisite. **Class 4, Credit 4 (offered quarterly)**

**0535-352** **Professional Communication for Business**  
An introduction to professional communication contexts and processes emphasizing both conceptual and practical dimensions. Participants engage in public speaking, small group problem solving and leadership, and professional writing exercises while acquiring theoretical background appropriate to understanding these skills. Service course for College of Business. No prerequisite. **Class 4, Credit 4 (offered quarterly)**

**0535-403** **Effective Technical Communication**  
This course provides knowledge and practice of written and oral communication skills generally required in technical professions. Focus is on individual and group writing and speaking tasks. Required course for various programs. **Class 4, Credit 4 (offered quarterly)**

**0535-410** **Computer-Mediated Communication**  
Computer-mediated communication (CMC) was originally defined as a form of electronic written communication. As networking tools advanced, CMC expanded to include new software developments, such as instant messaging and the World Wide Web. Today, the term "computer-mediated communication" refers to a wide range of technologies that facilitate both human communication and the interactive sharing of information through computer networks. Through readings, discussions and observations of online behavior, students will be introduced to CMC terms and theories to further develop their CMC skills. Professional elective for GPTC and GPTA degree programs; part of the communication minor; may be taken as a liberal arts elective. No prerequisite. **Class 4, Credit 4 (offered occasionally)**

**0535-411** **Health Communication**  
An introduction to the subject of communication in health care delivery and in public health campaigns, with an emphasis on interpersonal, organizational and mass communication approaches. Also covered is the interrelationship of health behavior and communication. This course is an elective for the professional and technical communication and the advertising and public relations majors. Part of the communication minor. No prerequisite. **Class 4, Credit 4 (offered annually)**

**0535-412** **Communication Law and Ethics**  
This course examines major principles and trends in communication law. The course analyzes a broad range of issues related to the First Amendment, intellectual property and media regulation. Special attention is paid to discussing the major ethical perspectives and issues surrounding contemporary communication behavior. Required course for professional and technical communication and advertising and public relations degree programs may be taken as an elective. No prerequisite. **Class 4, Credit 4 (offered annually)**

**0535-414** **Interpersonal Communication**  
This course will study the analysis and application of the major theories of interpersonal communication in various situations. It focuses on perception of self and others, language use, nonverbal communication and symbolic interaction in the communication of shared meanings in face-to-face interpersonal relationships. Elective course for communication and advertising and public relations majors; part of the communication minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0535-415** **Organizational Communication**  
Examines both interpersonal and small group communication in organizational settings. Topics include information flow and networks, organizational theory, managerial decision making, interviewing, organizational development, corporate culture and conflict resolution. Professional elective for communication and advertising and public relations majors. Part of the communication minor may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0535-416** **Newsriting**  
This course introduces students to the principles and practices of gathering, evaluating, investigating and presenting information to general audiences. Rights and responsibilities of the press will be analyzed. Although special emphasis will be given to writing and reporting for print publications, other media will be addressed. Special attention will be given to the qualities of writing, especially organization, accuracy, completeness, brevity and readability. Assignments must conform to Associated Press style, and deadlines will be enforced. Part of the journalism minor; the undergraduate communication minor; a professional elective for the undergraduate communication majors and a professional elective for the advertising and public relations majors. No prerequisite. **Credit 4, Class 4 (offered twice annually)**

**0535-420** **Argument and Discourse**  
Examines the process of oral argumentation encountered in the "give and take" of formal and informal communication situations. Emphasizes development of research, speaking, organization, writing, oral cross examination and critical listening abilities. Students are taught to develop the means to argue cogently in different interactive communication situations. Professional elective for communication and advertising and public relations majors; part of the communication minor; may also be taken as an elective. (0535-501 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0535-421** **Public Relations**  
An introduction to the study of public relations. Topics include history, research areas, laws, ethics and social responsibilities as they relate to the theory and practice of public relations. Required course for advertising and public relations majors; a professional elective course for communication majors; part of the communication minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0535-422** **Ethics in Technical Communication**  
Ethics is the study of morals, of what is right and good, especially regarding specific moral choices. In a given situation, a system of ethics helps us answer the question, What should I do? Ethics in Technical Communication explores the ways in which ethical conduct is important in the communication of technical information, particularly among professional technical communicators; establishes principles based on the history of ethical studies for making ethical choices as technical communicators; and provides opportunities to apply ethical principles to case studies in order to better understand the often problematical nature of ethical choices in technical, or any, communication. Professional elective for communication and advertising and public relations majors; part of the communication minor; may also be taken as an elective. (0502-227 or equivalent) **Class 4, Credit 4 (offered occasionally)**

**0535-426** **Archival Research**  
An applied learning experience that guides students through the process of research using special collections of archival material significant to visual communication. The course provides an opportunity to develop specialized research skills necessary to access, retrieve and examine specific artifacts in archival collections. Archives of special importance to visual communication include collections of advertising, documentary photography, photojournalism, public information posters, artifacts of propaganda, historical iconography and the visual media of film and television. Professional elective for communication and advertising and public relations majors; part of the communication minor; may also be taken as an elective. (0535-450) **Class 4, Credit 4 (offered occasionally)**

- 0535-445 Theories of Communication**  
An introduction to human communication theory, including a history of the major stages in development of modern theories of communication. Theories based both in the humanities and the social sciences are covered. Required course for communication and advertising and public relations majors only. **Class 4, Credit 4 (offered occasionally)**
- 0535-446 Writing the Technical Manual**  
Develops in students those skills necessary for designing, writing and editing long technical manuals. Special emphasis is given to graphics and page layout. Students enrolling should have command of concise English prose. Professional elective for communication and advertising and public relations majors; part of the communication minor; may also be taken as an elective (0502-227 and 0535-430) **Class 4, Credit 4 (offered occasionally)**
- 0535-450 Visual Communication**  
Examines communication processes and principles that use the visual mode. Through a survey of several areas represented in the literature of visual communication, this course examines theories, analysis and the meanings of images. Emphasis is on communicative understanding rather than on aesthetic, technical or skills approach. Discussion primarily depends on, but is not limited to, photographic images. Required course for communication and advertising and public relations majors; part of the communication minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**
- 0535-452 Uses and Effects of the Mass Media**  
An analysis of the "effects" and the "uses and gratifications" of mass communication research with focus on building mass communication theory. Professional elective for communication and advertising and public relations majors; part of the communication minor; may also be taken as an elective. (0535-482) **Class 4, Credit 4 (offered occasionally)**
- 0535-460 Copywriting and Visualization**  
An opportunity for undergraduates to learn the verbal and visual thinking skills utilized in the creation of advertising messages. Students will develop creative advertising messages by researching and writing a creative brief and then implementing the plan by transforming concepts into actual advertising messages and campaigns. Required course for advertising and public relations majors; professional elective for communication majors; part of the communication minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**
- 0535-461 Principles of Advertising**  
An introduction to advertising that shows how it is integrated into the larger discipline of marketing communications. Marketing communications is the integration of internal and external communication systems. It involves coordinating the various promotional mix elements (advertising, sales promotion, publicity and public relations) along with other marketing activities to more effectively communicate with a company's customers. Required course for advertising and public relations majors; professional elective for communication majors; part of the communication minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**
- 0535-462 Digital Design**  
An introduction to advertising message design through the use of digital technology. A wide variety of computer software programs are available to support the research, writing, visualization and design of messages. Students will have an opportunity to work with desktop publishing, image processing and design templates to enable them to think about their copy concepts in a variety of advertising layouts. Digital tools will be available for students with a variety of different levels of computer skills. Novice users can work with advertising templates to visualize messages. More advanced students can modify or create their own templates. Required course for advertising and public relations majors; professional elective for communication majors; part of the communication minor; may also be taken as an elective. (0535-461) **Class 4, Credit 4 (offered twice annually)**
- 0535-463 Campaign Management and Planning**  
An introduction to managing and planning advertising and public relations campaigns. The course takes a team project approach thereby helping students learn how to work together in class as well as in a competitive agency. Service learning will be used to expose students to community causes and not-for-profit organizations. Required course for advertising and public relations majors; professional elective for communication majors; part of the communication minor; may also be taken as an elective. (0535-421, 461) **Class 4, Credit 4 (offered annually)**
- 0535-464 Public Relations Writing**  
This course covers a variety of forms of writing for public relations, including news releases, newsletters, backgrounders, public service announcements, magazine queries, interviews, coverage memos, media alerts, features, trade press releases and public presentations. Students will write for a variety of media, including print, broadcast and the Web. Required course for advertising and public relations majors; professional elective for communication majors; part of the communication minor; may also be taken as an elective. (0535-421) **Class 4, Credit 4 (offered annually)**
- 0535-465 Rhetoric of Political Campaigns**  
The course is an overview of the rhetorical dimensions, history and functions of political communication. Students will read communication and rhetorical theories that connect the ways in which the form, content and context of campaign rhetoric invite citizens to conceive of themselves, the candidates and the nation as members of a political community. Students will consider a range of communicative practices toward understanding how they help to shape our attitudes, beliefs, values and actions. The examination of political communication will include "stump" speaking, debating, television advertising, political Web pages and the media's role in the political process. Professional elective for the professional and technical communication and the advertising and public relation programs; part of the communication minor; may be taken as a liberal arts elective. **Class 4, Credit 4 (offered occasionally)**
- 0535-470 Law and Ethics of the Press**  
This course explores the legal, ethical and regulatory issues involving print, broadcast and electronic journalism. Topics include but are not limited to the following: prior restraint, defamation, privacy, obscenity, free press-fair trial, freedom of information and regulation of electronic media. Part of the undergraduate communication major; the advertising and public relations major; the photojournalism major; the undergrad communication minor and the journalism minor. **Class 4, Credit 4 (offered twice annually)**
- 0535-471 History of Journalism**  
This course presents the history of American journalism from colonial times to the present, including the advance of press freedom under the First Amendment and how it has affected the development of American media. The influences of Europe, colonial politics in America, national expansion, urbanization, war and technology are further developed. Journalism's relationship to politics, institutions and culture will be investigated. Newspaper, magazine and broadcast industries will be examined for ideas that have changed American journalism. Part of the professional and technical communication and the advertising and public relations degree programs; part of the journalism and communication (undergrad) minors. No prerequisite. **Class 4, Credit 4 (offered annually)**
- 0535-472 News Editing**  
This course introduces students to the principles and practices of editing hard news and feature articles, including news judgment, story selection, headline writing, copy and picture editing. The course emphasizes reader interest, readability, clarity, verification and style as well as legality, ethics and propriety. No prerequisite. Part of the journalism minor; may be taken as a liberal arts elective in the junior and senior year. **Class 4, Credit 4 (offered twice annually)**
- 0535-473 eJournalism**  
The Internet is an important source of news information, rivaling print, radio and television news. This course introduces students to the principles and practices of online news reporting, including writing for mainstream news sites, journalistic blogs (Web logs), share and discussion sites, and other, evolving, online news outlets. The course familiarizes students with the tools of the online reporter: for example, vetting sources on the Web, conducting e-mail interviews, and writing for Web pages. Also, students explore the cultural and ethical terrain unique to the wired environment. Part of the journalism minor; juniors and seniors may take this course as a liberal arts elective. No prerequisite. **Class 4, Credit 4 (offered annually)**
- 0535-474 Reporting in Specialized Fields**  
An in-depth study, analysis and practicum of a selected advanced and focused subject in professional journalism. Specific subject matter of the course varies according to faculty assigned and is published when the course is offered; students may enroll in this class no more than twice as long as the specific subject matter is different. Examples include education journalism, health journalism, business journalism, reporting public affairs, sports journalism, editorial (or opinion) writing, reporting for alternative media. Part of the photojournalism and communication degree programs; part of the journalism minor. (Junior or senior class status) **Class 4 Credit 4 (offered annually)**

**0535-475** **eJournalism**  
An introduction to the principles and practices of online news reporting, including writing for mainstream news sites, journalistic blogs (Web logs), share and discussion sites, and other, evolving online news outlets. The course familiarizes students with the tools of the online reporter and explores the cultural and ethical terrain unique to the digital environment. Professional elective for professional and technical communication majors and advertising and public relations majors. Part of the journalism minor, and may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0535-475** **eJournalism II**  
Further development of skills learned in eJournalism, with an emphasis on writing and design skills for rich (online) media and an overview of new trends. Course will cover writing, designing and packaging content to attract and inform online news consumers. Required course for Journalism majors in their third year. Part of the journalism minor and as an elective in the GPTC and GPTA degree programs. Prerequisites: Newswriting, eJournalism, Digital Design in Communication. **Class 4, Credit 4 (offered annually)**

**0535-480** **Human Communication**  
An overview of the field of communication, including the contexts of interpersonal, group, mass and public communication. Part of the communication concentration and minor; may also be taken as an elective. **Class 4, Credit 4 (offered twice annually)**

**0535-481** **Persuasion**  
An in-depth study of the theories, practices, effects and ethics of persuasion: human communication designed to influence another's beliefs, values, attitudes and actions. Required course for communication and advertising and public relations majors; part of the communication concentration and minor; may be taken as an elective. **Class 4, Credit 4 (offered regularly)**

**0535-482** **Mass Communications**  
This course takes an "institutions" perspective, focusing on the history and development, laws and regulations, and theory and practice of mass communication. Additional topics will include the composition of audiences, how media affect and are affected by society, and future trends and career opportunities. Required course for communication and advertising and public relations majors; part of the communication concentration and minor; part of the journalism minor; may also be taken as an elective. No prerequisite. **Class 4, Credit 4 (offered regularly)**

**0535-483** **Small Group Communication**  
Practice and analysis of a variety of small group discussion techniques focusing on processes of interaction, decision making, norms structure and development, membership and theory of group development. Professional elective for communication and advertising and public relations majors; part of the communication concentration; minor may also be taken as an elective. **Class 4, Credit 4 (offered twice annually)**

**0535-484** **Rhetoric of Race Relations**  
Examines the history of the struggle for freedom and equality for blacks in American society. This course traces the history and rhetoric of key spokespersons from the pre-Civil War period through the 20th century as evidenced in texts of selected public speeches and reactions to them. Professional elective for communication and advertising and public relations majors; part of the minority relations concentration and the communication minor; may be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0535-490** **Persuasion and Social Change**  
Reading and analysis of persuasive tactics for or against social change in the United States from the 18th century through contemporary advocacy. Professional elective for communication and advertising and public relations majors; part of the peace studies concentration, the communication minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0535-501** **Public Speaking**  
This course focuses on the development of formal public speaking techniques as an aid to self-confidence in modern social and business situations. Weekly practice talks emphasize organization, clarity, vocal expressions and poise. Required course for communication and advertising and public relations majors; part of the communication concentration and minor; may also be taken as an elective; may also be taken for arts of expression credit. **Class 4, Credit 4 (offered quarterly)**

**0535-502** **Speech Writing**  
An advanced elective course in communication for those who wish to enhance their abilities to write professional public speeches for themselves or others. The course uses real-life situations as a context for speech writing assignments in a variety of genres. Professional elective for communication and advertising and public relations majors; part of the communication minor; may also be taken as an elective. **Class 4, Credit 4 (offered occasionally)**

**0535-520** **Intercultural Communication**  
An examination of the role of culture in face-to-face interaction. Students may find a basic background in communication, anthropology or psychology useful. Professional elective for communication and advertising and public relations majors; part of the Arabic and French language/culture concentrations; the communication minor; may also be taken as an elective. **Class 4, Credit 4 (offered annually)**

**0535-525** **Special Topics in Communication**  
A focused, in-depth study and analysis of a selected advanced topic in communication and associated issues. Specific topic varies according to faculty assigned and is published when the course is offered. Topics may include semiotics, communication technologies, gender differences in communication, and censorship and propaganda. Professional elective for communication and advertising and public relations majors. (For junior/senior communication majors; permission of instructor required for all others) **Class 4, Credit 4 (offered occasionally)**

**0535-532** **Professional Writing**  
Students develop writing, research and interviewing skills necessary to the composition of articles for magazines, newsletters and similar publications. In addition, students learn how to investigate the market for and "sell" their writing and how to write query letters. Much of the course is conducted as a workshop, during which students appraise each other's work and make suggestions for revision. Required course for communication majors; professional elective for advertising and public relations majors; part of the communication and journalism minors. (0502-227) **Class 4, Credit 4 (offered twice annually)**

**0535-550** **Film and Society**  
An inquiry concerning the relationship between motion pictures and society that uses historical, humanistic and social science research to achieve an understanding of movies as a social force, industry and art form. Professional elective for communication and advertising and public relations majors; part of the communication minor; may also be taken as an elective. (0535-482) **Class 4, Credit 4 (offered occasionally)**

**0535-580** **International Media**  
An introduction to media technology use in the international setting and in various countries and regions of the world. Selective theories about the media, international communication developments, and government challenges and restrictions also are considered. Professional elective for professional and technical communication majors and advertising and public relations majors. No prerequisite. **Class 4, Credit 4 (offered occasionally)**

**0535-595** **Senior Thesis in Communication**  
A guided research seminar culminating in a major project that brings together the student's communication studies and substantive work in his or her professional core. Focuses on designing, conducting and completing an independent research project. The progress of each project is shared with the class for discussion and critiques. Required course for communication and advertising and public relations majors only. (0535-315, 316, 445) **Class 4, Credit 4 (offered twice annually)**

## Honors Courses

**0550-325** **Honors Colloquium**  
The Honors Colloquium is an advanced introduction to the disciplines of the liberal arts general education core. It combines inquiry into the foundations of the disciplines with discussion of emerging trends within and inter-relationships among the disciplines. Preferably, students will register for this colloquium in the fall or winter quarters of their first year in the program, receiving 4 credits towards their liberal arts core. The purpose of the colloquium is to provide Honors students with an intellectually rich, diverse and discussion-based engagement with scholarly readings and presentations by representatives of the disciplines. A faculty member will be responsible for organizing the presentations, facilitating discussion and evaluating students' oral and written participation. **Class 4, Credit 4 (offered occasionally)**

# College of Science

## Index

1001	Biological Sciences	135
1004	General Biology	138
1005	Field Biology	139
1006	Environmental Science	139
1008	Analytical Chemistry	139
1009	Biochemistry	140
1010	Chemistry	141
1011	General Chemistry	141
1012	Inorganic Chemistry	142
1013	Organic Chemistry	142
1014	Physical Chemistry	143
1015	Environmental Chemistry	143
1016	Mathematics and Statistics	144
1017	Physics	148
1018	General Science	151
1026	Medical Sciences	151
1029	Polymer Chemistry	143
1030	Diagnostic Medical Sonography	152
1032	Physician Assistant	154
1051	Imaging Science	156
1055	Honors Courses	139, 148

*Course numbering: RIT courses are generally referred to by their seven-digit registration number. The first two digits refer to the college offering the course. The third and fourth digits identify the discipline within the college. The final three digits are unique to each course and identify whether the course is noncredit (less than 099), lower division (100–399), upper division (400–699), or graduate level (700 and above).*

*Unless otherwise noted, the following courses are offered annually. Specific times and dates can be found in each quarter's schedule of courses, published by the Office of the Registrar. Prerequisites/corequisites are noted in parentheses near the end of the course description.*

## Biological Sciences

**1001-200** **Freshman Symposium**  
An introduction to academic and student life in the biological sciences department. **Class 2, Credit 1 (F)**

**1001-201** **General Biology**  
A study of the characteristics and origin of life; basic principles of modern cellular biology, including cell organelle structure; chemical basis and functions of life, including enzyme systems, cellular respiration and photosynthesis; nutrient procurement in plants and animals. (High school biology and chemistry) **Class 3, Credit 3 (F)**

**1001-202** **General Biology**  
A study of the physiological processes of gas exchange, internal transport, osmoregulation, excretion and hormonal control in plants and animals; nervous system and behavior in animals. (1001-201 or permission of instructor) **Class 3, Credit 3 (W)**

**1001-203** **General Biology**  
A study of cellular and organismal reproduction, the principles of genetics and developmental biology, and an introduction to evolution and ecology. (1001-202 or permission of instructor) **Class 3, Credit 3 (S)**

**1001-205** **General Biology Laboratory**  
Laboratory work to complement the lecture material of General Biology (1001-201). The experiments are designed to illustrate concepts; develop laboratory skills and techniques; and improve ability to make, record and interpret observations. (Corequisite 1001-201) **Lab 3, Credit 1 (F)**

**1001-206** **General Biology Laboratory**  
Laboratory work to complement the lecture material of general biology (1001-202). The experiments are designed to illustrate concepts, develop laboratory skills and techniques, and improve ability to make, record and interpret observations. (Corequisite 1001-202) **Lab 3, Credit 1 (W)**

**1001-207** **General Biology Laboratory**  
Laboratory work to complement the lecture material of general biology (1001-203). The experiments are designed to illustrate concepts, develop laboratory skills and techniques, and improve ability to make, record and interpret observations. (Corequisite 1001-203) **Lab 3, Credit 1 (S)**

**1001-251** **Introduction to Biology I**  
A study of the chemical basis of life, including biologically important molecules, the structure and function of cells, the inheritance of genetic traits, and control of the expression of genes. The course emphasizes an evolutionary perspective and the integration of different levels of biological organization. Lab consists of two multi-week projects in which teams of students apply biological information and laboratory techniques in real-world applications. (High school biology and chemistry; biological sciences program major; or permission of instructor) **Class 3, Lab 3, Credit 4 (F)**

**1001-252** **Introduction to Biology II**  
A study of archaea, bacteria, viruses, protists and plants that emphasizes the value of an evolutionary approach in biomedicine, bioinformatics and biotechnology. Lab consists of two multi-week projects in which teams of students expand on basic studies of real-world biological problems to develop their own hypotheses and design experiments to test them. (Biological sciences program major and 1001-251, or permission of instructor) **Class 3, Lab 3, Credit 4 (W)**

**1001-253** **Introduction to Biology III**  
A study of animal physiology, behavior and ecology that explores the relationship between structure and function from an evolutionary perspective with emphasis on the application of basic biological information to conservation and management. Lab consists of two multi-week projects: first, an analysis of human evolution using molecular methods (polymerase chain reaction and base sequencing of mitochondrial DNA), followed by a project that is selected and carried out by teams of students and culminates in a poster session in the final week of the quarter. (Biological sciences program major and 1001-252, or permission of instructor) **Class 3, Lab 3, Credit 4 (S)**

**1001-260** **Introduction to Bioinformatics**  
This course is intended to provide an overview of bioinformatics for those who are either curious about what this exciting field entails or about whether bioinformatics represents a sound career path. Pursuant to this goal we will touch upon many subjects but will not explore any one in particular detail. Nevertheless, suggestions are welcome from anyone regarding projects to pursue outside of class in order to gain a deeper understanding of any aspect of bioinformatics that appeals to a personal interest. **Class 2, Credit 2 (F)**

**1001-280** **Laboratory Teaching Experience**  
This course provides qualified undergraduate students the opportunity to gain experience in a laboratory instructional setting under the direct guidance of a faculty member. Students are required to prepare and present pre-lab discussions, assist in the design and set up of labs, answer enrolled-student questions, and perform lab demonstrations and other associated duties and responsibilities. (Contact faculty member for specific eligibility criteria.) **Class 0, Lab 3, Credit 1 (F, W, S)**

**1001-289** **Independent Study**  
Faculty-directed study of appropriate topics on a tutorial basis. Enables an individual to pursue studies of existing knowledge in the literature. (One year of Introductory Biology or equivalent) **Class variable, Credit variable (F, W, S, SU)**

**1001-291** **Biological Science Research**  
Faculty-directed research projects involving field or laboratory work, including data collection and analysis. (Permission of instructor) **Class variable (F, W, S, SU)**

**1001-292** **Biological Science Research**  
Continuation of faculty-directed research projects involving field or laboratory work, including data collection and analysis initiated in 1001-291. (1001-291 and permission of instructor) **Class variable (F, W, S, SU)**

**1001-293** **Biological Science Research**  
Continuation of faculty-directed research projects involving field or laboratory work, including data collection and analysis initiated in 1001-291 and continued in 1001-292. (1001-292 and permission of instructor) **Class variable (F, W, S, SU)**

- 1001-300** **Introduction to Co-op Seminar**  
An exploration of cooperative education opportunities in the biological sciences. Practice in writing letters of application, résumé writing and interviewing procedures. **Class 1, Credit 1 (W)**
- 1001-301** **Invertebrate Zoology**  
A study of the biology of invertebrate animals with emphasis on phylogeny and functional morphology. (One year of introductory biology or equivalent or permission of instructor) **Class 3, Lab 3, Credit 4 (F)**
- 1001-302** **Vertebrate Zoology**  
A study of the morphology, physiology, behavior, classification and ecology of chordates. (One year of introductory biology or equivalent or permission of instructor) **Class 3, Lab 3, Credit 4 (W)**
- 1001-304** **Botany**  
A study of the distribution of the major groups of plants and their adaptations to their particular environment. (1001-253 or equivalent or permission of instructor) **Class 3, Lab 3, Credit 4 (W)**
- 1001-307** **Perl for Bioinformatics**  
This is an introductory course in Perl scripting language and its applications to biological data. The use of Perl for processing sequence data, managing a variety of biological data types, and providing effective Web and graphical interfaces to existing tools for analysis of these data will be investigated. (4003-231, 4003-232 or equivalent) **Class 2, Credit 2 (S)**
- 1001-311** **Cell Biology**  
Principles of cell biology, including internal cell structure, cell cycle and growth control, cell interactions, cell differentiation and the extracellular matrix with an emphasis on the observations and experimental evidence supporting them. (One year of introductory biology or equivalent) **Class 4, Credit 4 (F, W)**
- 1001-312** **Immunology**  
An introduction to the fundamental facts and concepts related to immunology, including innate immunity and adaptive immunity; cells, molecules, tissues and organs of immune "system"; cell-cell communication and interaction; antibody structure and function; and the applications of these concepts to infectious diseases, vaccine design, autoimmune diseases, cancer, transplantation, regulation of immune response, allergic reactions and immunosuppression. (1001-253, 1001-311) **Class 3, Credit 3 (W)**
- 1001-313** **Sports Biology**  
An introduction to the human physiology and anatomy of all types of sporting activities. Body systems studied include musculoskeletal, cardiovascular, neuromuscular and pulmonary. Motion, mobility, flexibility, strength, endurance and nutrition are other topics included in a comprehensive investigation of the biology of athletic performance. **Class 2, Credit 2 (F, S)**
- 1001-314** **Tissue Culture**  
Study of the techniques and applications of culturing cells, tissues and organs in vitro. Emphasis is on mammalian systems. (1001-253 or equivalent) **Class 3, Lab 4, Credit 5 (W)**
- 1001-315** **Hybridoma Techniques**  
This course is designed to acquaint each student with the basic methods employed in the production of hybridoma cell lines and monoclonal antibodies. Includes preparation of viable cell suspensions, lymphocyte-myeloma cell fusion using polyethylene glycol, selection for and culturing of hybridoma cells, cloning by limiting dilution, ELISA, immunization of mice, monoclonal antibody production and scale up of hybridoma cells. (1001-311 and 1001-314 required; 1001-312 recommended) **Lab 4, Credit 2 (S)**
- 1001-330** **Small-Animal Laboratory Techniques**  
This course prepares the student for small-animal handling, biological administrations and preparations, minor surgery and autopsies. (Third-, fourth- or fifth-year status and permission of instructor) **Class 1, Lab 3, Credit 3 (S)**
- 1001-340** **General Ecology**  
Introduction to ecosystem ecology stressing the dynamic interrelationships of plant and animal communities with their environments. A study to include such ecological concepts as energy flow and trophic levels in natural communities, plant responses and animal behavior, population dynamics, biogeography and representative ecosystems. (One year of introductory biology or equivalent) **Class 3, Lab 3, Credit 4 (F)**
- 1001-350** **Molecular Biology**  
The study of structure, function and organization of proteins, nucleic acids and other biological macromolecules. (One year of introductory biology or equivalent, 1001-311) **Class 3, Lab 3, Credit 4 (W, S)**
- 1001-365** **Evolutionary Biology**  
Topics covered will include the historical framework of evolutionary biology, the meaning and nature of evidence pertinent to biological evolution, Earth history, the evolution of proteins and the genetic code, cellular and metabolic evolution, molecular evolution, neutral theory vs. selection, genetic variation, natural selection, migration, mutation, genetic drift, fitness, population dynamics and genetics, species concepts and speciation, systematics and classification systems, molecular phylogenetics, the evolution of protozoans, plants, fungi, invertebrates and vertebrates, behavioral evolution, interactions among species, historical biogeography, human evolution and variation. (1001-251-253 or 1001-201-203) **Class 4, Lab 3, Credit 4 (F)**
- 1001-370** **Biological Writing**  
A study of written technical communication in the biological sciences with emphasis on components of report writing: analysis, definition, description, instruction, data presentation, literature research, abstracting and editing. **Class 3, Credit 3 (S)**
- 1001-375** **Galapagos: Evolution and Biogeography**  
The course examines geological and biological factors that made the Galapagos Islands a crucible in which Darwin formed the theory of evolution and discusses the origins of the islands by the twin mechanisms of plate tectonics and volcanism. Students observe recent lava flows and see initial biological colonists as well as ancient flows in advanced stages of colonization. The islands reveal the interaction between ocean currents, marine life, and mammalian and avian fauna that thrive on this rich sea life. Students observe many endemic species and subspecies and gain an understanding of adaptive radiation. The 11-day trip includes a visit to the Darwin Scientific Research Station. Students learn of the dangers of human infringement on the fragile ecology and efforts to conserve unique plant and animal species. Enrollment limited. Contact instructor fall quarter. Travel fee required. (1001-251-253 or 201-203) **Credit 4**
- 1001-390** **Vertebrate Evolution**  
A study of the major changes in vertebrate functional morphology through time, beginning with fish and ending with humans; fossil evidence depicting major transitions between the vertebrate classes; modern taxonomy, including cladistic analysis, geologic time and stratigraphy; and plate tectonics. (1001-253 or equivalent) **Class 4, Credit 4 (W)**
- 1001-395** **Ethical Issues in Medicine and Biology**  
Students will explore major ethical issues in medicine and biology via lecture, readings, films, and presentation and discussion of cases. Students will also be encouraged to report on current events in ethics as researched via the library computer search facilities and the internet. The first two weeks of the course will be lecture. Students will learn about various theories of ethical analysis that are in current use. Subsequent classes will be devoted to particular ethical areas. Relevant cases will be given to the students for presentation, any additional background material that may be required to discuss the cases will be presented by the instructor, and the remainder of the period will be taken up with discussion based on the philosophical foundation provided at the beginning of the course. (Second-year or above) **Class 3, Credit 3 (W)**
- 1001-401** **Management of an Industrial Laboratory**  
This course will develop familiarity and provide experience with the government regulations and forms used to govern operations in industrial laboratories. This will be accomplished by: writing standard operating procedures (SOPs) for general laboratory instrument operation; monitoring the control values of lab instrumentation and maintaining control charts on the equipment throughout the term; teaching the operation of the instruments to other students; verifying training by maintaining training records; and writing an SOP for a defined process using the tools available in the laboratory. **Class 2, Lab 2, Credit 2 (W)**
- 1001-403** **Cell Physiology**  
A study of functional eucaryotic cytology, nuclear and cytoplasmic regulation of macromolecular synthesis, exchange of materials across cell membranes, regulation of cellular metabolism and control of cell growth. (1001-350) **Class 3, Lab 3, Credit 4 (F)**



- 1001-404** **Introduction to Microbiology**  
An introduction to microorganisms and their importance. Principles of structure and function, metabolic diversity, taxonomy, environmental microbiology, bioremediation and infectious diseases of bacteria are discussed. Basic laboratory techniques: microscopy; staining, culturing, isolation and identification of bacteria; isolation and identification of normal flora; antibiotic resistance; metabolic tests; detection and counting of bacteria in environmental samples (foods, water, soils). (1001-253, 1001-311 required; 1013-233, 235 strongly recommended) **Class 3, Lab 4, Credit 5 (F, S)**
- 1001-405** **Plants, Medicine and Technology**  
Plants have played a significant role in the shaping of our world from the beginning to the present day. This course will explore our utilization of plants as food, fuels, materials, medicines, gene sources and social aspects over time in different cultures. The world depends on about 15 plant species, most of which have been changed by plant improvement methods. We will explore the changes that have occurred in these important crops. This course will be a blend of the uses of plants and plant constituents in medicine and how technology is used to produce, purify and provide the plant produced constituents. (Third-year status in the College of Science or consent of instructor) **Class 4, Credit 4 (F)**
- 1001-406** **Virology**  
This course is an introduction to virology with specific emphasis on the molecular mechanisms of virus infection of eukaryotic cells and virus-cell interactions. Virus structure, genetics, the infectious cycle, replication strategies, pathogenesis, persistence, effects on host macromolecular synthesis, viral oncogenesis, viral vectors, emerging viral diseases, and strategies to protect against and combat viral infection will be discussed. (1001-350, 1001-421) **Class 4, Credit 4 (W)**
- 1001-408** **Comparative Vertebrate Anatomy**  
A comparative study of organ systems of representative members of the vertebrates with emphasis on structural changes that occur during evolution. (1001-302 or 1001-365, or permission of instructor) **Class 3, Lab 6, Credit 5 (S)**
- 1001-411** **Histology**  
This course provides a detailed exploration of the microscopic and structural anatomy of normal human tissues and organs, with special emphasis given to the relationships between the cellular architecture of human organs and organ systems and their functions. The course also examines human disease as manifested by alterations in histological features. (1026-350, 360 or equivalent recommended) **Class 3, Lab 3, Credit 4 (S)**
- 1001-413** **Comparative Animal Physiology**  
A comparative study of fundamental physiological mechanisms. A broad range of organisms are studied from the standpoint of evolution of functional systems, the mechanisms and morphological variations that exist to deal with functional problems posed by the environment, and the special mechanisms used to cope with extreme environments. (One year of general biology or 1001-253, and 1001-365) **Class 3, Lab 3, Credit 4 (W)**
- 1001-416** **Plant Biotechnology**  
The course will investigate fundamental aspects of plant tissue culture and manipulation, the genetic transformation of plant cells, and the construction, characterization and application of transgenic plants to agriculture, plant molecular biology and novel product development. The laboratory will provide experiences to complement the lecture information in plant cell culture and in the use of *Agrobacterium* as the gene shuttle to introduce genetic information into plants. (1001-311, 1001-350, 1001-404) **Class 3, Lab 4, Credit 5 (W)**
- 1001-417** **Industrial Microbiology**  
Practical applications of yeasts, fungi and bacteria in industrial fermentations. Industrial aspects of fermentor design, pilot plant operations, strain development, generation of competent vectors, media development, economics of production, bioprocess simulation software, and examples of plant design and process development using various simulation software. The lab will consist of a 10-week project in the optimization of media and process parameters for the production of *Pichia pastoris* or *E. coli* to be used in recombinant protein production. Microbiology, biochemistry and engineering of large-scale processes are also discussed. (1001-404 and one biochemistry course) **Class 3, Lab 3, Credit 4 (W)**
- 1001-418** **Plant Molecular Biology**  
This course focuses on advanced approaches in plant biotechnology and emphasizes the crop model systems currently being used to study plant molecular biology and plant-microbe associations. *Arabidopsis* is the model organism used to unravel the developmental, genetic and biochemical basis of the plant. The course includes current applications and social/economic aspects of plant biotechnology to crop improvement for the production of food, horticultural and specialty products. Students will develop and write a research proposal related to plant molecular biology. (1001-416) **Class 4, Credit 4 (S)**
- 1001-420** **Plant Ecology**  
A consideration of the nature and variation of plant communities with discussion of factors that limit, maintain and modify communities both locally and worldwide. Laboratory centers on a student-designed project, including proposal, experimental design, data gathering and analysis, and presentation of results. (1001-340, 341) **Class 3, Lab 3, Credit 4 (S)**
- 1001-421** **Genetics**  
An introduction to the principles of inheritance; the study of genes and chromosomes at molecular, cellular, organismal and population levels. (1001-253 or equivalent) **Class 4, Credit 4 (F, W)**
- 1001-422** **Developmental Biology**  
A study of the processes of growth, differentiation and development that lead to the mature form of an organism. (1001-253 or equivalent, 1001- 311, 421) **Class 3, Lab 3, Credit 4 (W)**
- 1001-427** **Microbial and Viral Genetics**  
The study of molecular genetics of bacteria, bacteriophages, fungi and eucaryotic viruses. (1001-350, 421; one biochemistry course) **Class 3, Lab 3, Credit 4 (F)**
- 1001-450** **Genetic Engineering**  
An introduction to the theoretical basis, laboratory techniques and applications of gene manipulation. (1001-350) **Class 2, Lab 8, Credit 5 (S)**
- 1001-451** **Microbial Pathogenesis**  
Mechanisms of bacterial and fungal diseases, including topics in host response to pathogen invasion; subversion of host defenses; virulence factors; clinical signs and symptoms, treatment, diagnosis and prevention. The class will also feature the discussion of various clinical cases found in the Weekly Morbidity and Mortality Report produced by the Center for Disease Control. (1001-312, 1001-404) **Class 6, Credit 4 (W)**
- 1001-460** **Basic Pathology**  
An introduction to pathophysiology, the study of disease and its consequences. Major topics of lecture discussions and laboratory exercises deal with general pathologic processes, including cell injury/cell death, inflammation, immunological deficiencies, hemodynamic and fluid derangements and neoplasia. Clinical correlations are made as often as possible as examples of how physiological processes can go awry in the generation of a particular disease. (1001-251, 252, 253 or equivalent required; 1026-350, 360 strongly recommended) **Class 3, Lab 3, Credit 4 (S)**
- 1001-462** **Human Gross Anatomy**  
This course exposes students to details of human anatomy through cadaver dissection. Lecture material stresses functional and clinical correlates corresponding to laboratory exercises. (1026-350, 360 and permission of instructor) **Class 3, Lab 6, Credit 5 (S)**
- 1001-467** **Advanced Microbial Fermentation**  
This is an advanced course in industrial microbial fermentations. The students are presented with advanced topics in fermentation design, operation and the economics of operation. The course will also present various scientific papers pertaining to issues of scale up and process development at the industrial scale, including topics in media development, impeller optimization and plant design. The laboratory consists of a 10-week project in the optimization of product titers utilizing various principles of scale up with the SIXFORS computer-controlled fermentation system. The students will be using either *Ralstonia eutrophis* to produce PHAs, *Xanthomonas campestris* to produce xanthan gum, *Pichia pastoris* (cell yield for recombinant protein production) or *E. coli* (for recombinant protein production). (1001-404, 1001-417) **Class 3, Lab 3, Credit 4 (S)**

- 1001-471** **Freshwater Ecology**  
A study of the physics, chemistry and biology of inland waters. The course emphasizes the physical and chemical properties of water and how these properties affect the associated biological communities. Planktonic, benthic and littoral communities are considered. Field trips to streams and lakes are conducted to gather physical, chemical and biological data. (1001-340 or permission of instructor) **Class 3, Lab 3, Credit 4 (W)**
- 1001-473** **Marine Biology**  
This course explores marine biology by focusing on the diversity of life and influence of oceanography on the various ecosystems. Morphological and physiological adaptations and environmental threats will also be investigated. (One year of introductory biology or equivalent, or permission of instructor) **Class 3, Credit 3 (S)**
- 1001-474** **Animal Behavior**  
A comparative study of animal behavior from an evolutionary perspective. Lectures will examine the physiological organization of behaviors, survival behaviors, social dynamics and human behavior. (1001-365, 1016-319) **Class 3, Credit 3 (S)**
- 1001-475** **Conservation Biology**  
This course concentrates on the application of ecological principles to conservation issues. Human impact on species diversity will be emphasized as it relates to agricultural, forest, coastal and wetland ecosystems. Case studies of management practices used to manage and restore disturbed ecosystems will be included. Laboratory exercises will concentrate on methodologies for assessing human impacts on ecosystems, including the use of GIS technology. (1001-340, 341) **Class 3, Lab 3, Credit 4 (W)**
- 1001-481** **Independent Research**  
Faculty-directed projects of research usually involving original field or laboratory work. (Third-year status with a GPA of 2.5 in science and mathematics courses and consent of faculty) **Class variable, Credit variable (F, W, S, SU)**
- 1001-482** **Independent Research**  
Faculty-directed projects of research usually involving original field or laboratory work. (Third-year status with a GPA of 2.5 in science and mathematics courses and consent of faculty) **Class variable, Credit variable (F, W, S, SU)**
- 1001-483** **Independent Research**  
Faculty-directed projects of research usually involving original field or laboratory work. (Third-year status with a GPA of 2.5 in science and mathematics courses and consent of faculty) **Class variable, Credit variable (F, W, S, SU)**
- 1001-492** **Genomics**  
Genomics will introduce students to the analysis of complex genomes. Emphasis will be on genetic information derived from the human genome project, but advances with genomes of other model systems will be discussed. Lectures will cover scientific techniques used to map and sequence the human genome as well as strategies for identification of disease-susceptibility genes. The wet-bench laboratory will utilize an automated DNA sequencer to demonstrate the acquisition of genetic sequences. Laboratory sessions will emphasize cycle sequencing of cloned DNA fragments using an automated fluorescent DNA sequencer and mapping tactics using radiation hybrid cell panels. (1001-350) **Class 3, Lab 3, Credit 4 (F)**
- 1001-493** **Bioinformatics**  
Bioinformatics will introduce students to the analysis of genetic sequences. Emphasis will be on genetic information derived from the human genome project, but findings from genomes of other model systems will be presented. Lectures will discuss available computational tools for extracting biological information from nucleotide and protein sequences. The computer-based laboratory will utilize bioinformatics software to demonstrate how to manage, search and analyze genetic sequences. Laboratory sessions will cover gene prediction programs, DNA fragment assembly, multiple sequence analysis, secondary structure predictions, phylogenetic constructions and Web access to public databases. (1001-350) **Class 3, Lab 3, Credit 4 (W, S)**
- 1001-494** **Molecular Modeling and Proteomics**  
The course will explore two facets of protein molecules: their structure and their expression. The structure component will build upon information from the Bioinformatics course and will add further sophistication with analysis of intermolecular interactions and ligand/receptor pairing. Software that permits molecular docking experiments will be employed. Tissue-specific protein expression will be addressed in lectures with description of micro-array technology and, in the laboratory, with two-dimensional protein gel electrophoresis. (1001-492, 493) **Lab 6, Credit 4 (S)**
- 1001-499** **Biology Co-op**  
Cooperative education experience for undergraduate biological sciences students. **Credit 0 (offered every quarter)**
- 1001-502** **Advanced Immunology**  
The lecture material covers in depth the molecular and cellular events of antigen processing, recognition of antigen by T lymphocytes and their subsequent activation. The two distinct processing pathways for exogenous and endogenous antigens will be contrasted, in regards to intra-cellular compartments, proteolytic mechanisms and site of assembly with the major histocompatibility complex (MHC) molecules. Distinctions in maturation and transport to the cell surface of the two classes of peptide-loaded MHC molecules will be discussed. The structure, genetics, polymorphism and cell surface expression of MHC molecules will be covered. The intracellular events that occur following antigen recognition and the two-signal model for T cell activation will be presented. The phenomenon of positive/negative selection within the thymus during T cell differentiation will be covered. (1001-350, 402) **Class 3, Lab 3, Credit 4 (S)**
- 1001-550** **Biology Seminar**  
The seminar consists of written and oral reports, discussed by class members, covering topics of current interest in the biological sciences. (40 quarter credits in biology and successful completion of the departmental writing requirement) **Class 2, Credit 2 (W, S)**
- 1001-555** **Modeling Population Genetics for Non-Programmers**  
This course focuses on the mathematical modeling of population genetics and the implication for studies of human genetic diversity. Emphasis is on the use of these models in medical research, forensics and pharmacogenomics. Labs apply the lecture material in computer simulation models using Excel. (1001-421 or equivalent; or permission of instructor) **Class 3, Lab 3, Credit 4 (F)**
- 1001-559** **Special Topics: Biology**  
Special topics are advanced courses of current interest and/or logical continuations of the courses already being offered. These courses are structured as ordinary courses and have specified prerequisites, contact hours and examination procedures. **Class variable, Credit variable (Offered upon sufficient request) (F, W, S)**
- 1001-567** **Environmental Microbiology**  
This is an advanced course in the principles of soil microbiology, groundwater microbiology, wastewater microbiology and composting microbiology. The class will also focus on practical applications of microorganisms isolated from various types of environments. Examples of commercial use of microorganisms will also be presented. The lab consists of a series of experiments looking at the microbial flora of soils and water. Students will attempt to isolate microorganisms from soil samples that are capable of degrading organic compounds. Students will also determine the biological oxygen demand of various water sources and sediment samples found in western New York. (1001-404) **Class 3, Lab 3, Credit 4 (F)**
- 1001-570** **Research Scholars I**  
This course is taken in the first quarter of the research scholars program. Students undertake long-term research projects under the mentorship of a faculty sponsor. Students must apply to the research scholars program and be accepted prior to registration. **Class variable, Credit variable 1-4 (F, W, S, SU)**
- 1001-571** **Research Scholars II**  
This course is taken in the second quarter of the research scholars program. Students undertake long-term research projects under the mentorship of a faculty sponsor. Students will give oral presentations on their research projects, which will be evaluated by a faculty committee. Students must have an A or B in Research Scholars I and submit an updated research plan to the research scholars committee in order to register. **Class variable, Credit variable 1-4 (F, W, S, SU)**
- 1001-572** **Research Scholars III**  
This course is taken in the third quarter of the research scholars program. A student must earn at least a B in this course to be designated a "research scholar." Students undertake long-term research projects under the mentorship of a faculty sponsor. Students must have received an A or B in Research Scholars II and submit an updated research plan to the research scholars committee in order to register. **Class variable, Credit variable 1-4 (F, W, S, SU)**
- 1004-210** **Microbiology in Health and Disease**  
This course is an introduction to microorganisms; their relationship to the environment and human health; the causes, prevention and treatment of infectious diseases; and the role of microorganisms in the preparation and spoilage of foods. (One year of high school biology or equivalent) **Class 4, Credit 4 (F)**

**1004-211** **Human Biology I**  
This course is a general study of human anatomy and physiology. The course includes discussions of cellular biology and skeletal, muscular, nervous and endocrine systems. **Class 3, Credit 3 (F)**

**1004-212** **Human Biology II**  
This course is a general study of human anatomy and physiology with emphasis on mechanisms by which the nervous and endocrine systems coordinate and integrate body functions. This second course includes discussion of nutrition and metabolism and respiratory, circulatory, lymphatic, urinary and reproductive systems. **Class 3, Credit 3 (W)**

**1004-231** **Human Biology I Laboratory**  
This laboratory complements the lecture material of 1004-211. Experiments are designed to illustrate the dynamic characteristics of cells, tissues and organ systems. **Lab 2, Credit 1 (F)**

**1004-232** **Human Biology II Laboratory**  
A laboratory for dietetic and medical illustration students to complement the lecture material of 1004-212. Experiments are designed to illustrate the dynamic anatomy and physiology of major organ systems. **Lab 2, Credit 1 (W)**

**1004-289** **Contemporary Science: Biology**  
A study in various biological topics relevant to contemporary problems of society. Topics may include population biology, pollution, disease control, human heredity, contagious diseases, marine biology, bioethics. **Class 4, Credit 4 (SU)**

**1004-315** **Medical Genetics**  
A survey of selected human variations and diseases of medical importance, with emphasis on the underlying genetic principles. (1001-203 or equivalent) **Class 2, Credit 2 (F)**

**1005-210** **Field Biology for Non-science Students**  
This course is an introduction to the ecology of individuals, populations and communities. The dynamic interaction between organisms and their environment will be stressed. Included will be the concepts of energy flow and nutrient cycling in ecosystems, population dynamics, food webs, and the causes of temporal and spatial changes in communities. **Class 3, Lab 3, Credit 4 (S)**

**1005-250** **Galapagos: Ecology and Evolution**  
This is an 11-day field course in Ecuador and the Galapagos Islands. Students meet weekly on the RIT campus during spring quarter to learn about the wild-life and geology of the islands and about their influence on Darwin's theory of evolution. The difficulties of balancing human problems with environmental conservation are ongoing problems in the Galapagos. The actual field trip occurs in May, right after graduation. We charter a boat and cruise among the islands for one week. There are daily shore excursions and frequent snorkeling opportunities. The course provides outstanding opportunities for nature photography. Although this is a spring quarter offering, students must contact the instructor during the previous fall quarter. Enrollment is limited to 11 students. A travel fee is required. **Credit variable (S)**

**1005-305** **Bird Banding**  
This course is designed to prepare the student to safely band passerine species of birds and to safely engage in research using banding methods. The course is also designed to meet requirements of the United States Fish and Wildlife Service and the North American Banding Council for banders and for bander training. This course constitutes the first step towards obtaining a USFWS permit to band birds and to conduct research. (One year of biology or permission of instructor) **Class 2, Lab 6, Credit 2**

**1006-202** **Concepts of Environmental Science**  
This course introduces the interdisciplinary nature of environmental science through the study of topics like ecosystems and biodiversity, land cover change, energy, pollution, and global climate change. A unifying theme is the concept of sustainability. This is part of the required course sequence for all students in the environmental science degree program. **Class 3, Lab 3, Credit 4 (F)**

**1006-203** **Environmental Science Field Skills**  
This course introduces students to problem-based learning by focusing on a watershed assessment while learning about water quality and water quantity issues and analyses, land cover change, wetlands and soils. The watershed project will also involve environmental education and outreach activities linked to Earth Day. Part of the required course sequence for all students in the environmental science degree program. **Class 3, Lab 3, Credit 4 (S)**

**1006-350** **Applications of Geographic Information Systems**  
Through hands-on projects and case studies, this course illustrates concepts and applications of vector geographic information systems (GIS) in a variety of disciplines, such as environmental science, biology, geology, geography, sociology and economics. Students will learn how to use GIS software, plan a project, create a database and conduct independent analysis. No official pre-requisites, but students should be comfortable working with computers, and experience with programming is also useful. **Class 3, Lab 3, Credit 4 (F)**

**1006-450** **Raster Applications of GIS**  
This course focuses on raster data and surfaces, digital imagery and the integration of raster geographic information systems (GIS) data and analyses with vector GIS. Topics will include vector-to-raster conversions; managing raster layers, attributes and databases; overlay analyses; neighborhood analyses; map algebra; surface modeling (2-D and 3-D); and basic remote sensing applications. Students will read and discuss case studies from a variety of disciplines using raster analyses, learn and apply similar tools and analyses in a series of lab experiments, and conduct an independent project based on lab exercises or a topic of their own interest. No prerequisite, but 1006-350 Applications of GIS is strongly recommended. **Class 3, Lab 3, Credit 4 (W)**

**1006-499** **Environmental Science Co-op**  
Cooperative education experience for undergraduate environmental science students. **Credit 0**

**1006-503** **Environmental Science Capstone**  
This course is designed to assist students in the implementation of the group projects designed as part of the two Great Lakes courses (508-463 and 508-464) and continues the integrated presentation of interrelated, interdisciplinary principles of environmental science, focusing on the Great Lakes ecosystem. Students will be introduced to a variety of problem-solving skills and scientific analyses (issue dependent), discuss case studies and interact with local environmental professionals. (Permission of instructor) **Class 2, Lab 4, Credit 4 (S)**

**1006-559** **Special Topics**  
Courses that are of current interest and/or logical continuations of the courses already being offered. These courses are structured as ordinary courses and may have specified prerequisites, contact hours and examination procedures. **Class variable, Credit variable (F, W, S, SU)**

**1006-599** **Environmental Science Independent Study**  
Independent study is a faculty-directed study of appropriate topics on a tutorial basis that enables an individual to pursue studies of existing knowledge available in literature. **Class variable, Credit variable (F, W, S, SU)**

**1055-300** **The Greening of RIT**  
This course seeks to teach students about the concept of sustainability by using the RIT campus as their laboratory. During the quarter, students will investigate methods and strategies used by other colleges and universities to minimize environmental impacts in areas such as energy use, solid and hazardous waste management, transportation, landscaping and construction, food production and consumption, and purchasing. They will assess their personal and RIT's environmental impacts, develop strategies for minimizing the impacts, implement changes where possible and prepare reports designed to guide RIT to becoming a greener campus. (Honors student status) **Class 3, Lab 3, Credit 4 (S)**

## Chemistry

**1008-261** **Quantitative Analysis I**  
This course is designed for chemistry, polymer chemistry and biochemistry majors or those interested in pursuing the major. Topics include theoretical introduction to quantitative methods, including gravimetric techniques, equilibria, statistical methods and solution chemistry. (Corequisites 1008-265, 1010-252) **Lecture 3, Credit 3 (W)**

**1008-262** **Quantitative Analysis II**  
This course is designed for chemistry department majors or those interested in pursuing the major. Topics include equilibrium for polyprotic acids, electrochemistry and redox reactions, spectroscopy, potentiometry and electrogravimetric determinations. (Corequisite 1008-266) (1008-261, 265) **Lecture 4, Credit 4 (S)**

**1008-265** **Quantitative Analysis I Laboratory**  
This laboratory is designed for chemistry department majors or those interested in pursuing the major. Experiments include statistics, calibration of equipment, spectroscopy, volumetric analyses and kinetics. (Corequisites 1008-261, 1010-252) **Lab 4, Credit 1 (W)**

- 1008-266** **Quantitative Analysis II Laboratory**  
This laboratory is designed for chemistry department majors or those interested in pursuing the major. Experiments include statistics and calibration of equipment; Gran Plot, double endpoint titration (carbonate/bicarbonate), potentiometric titration, electrogravimetric and photometric determination of copper; water hardness. Lab report writing is emphasized. (Corequisite 1008-262) (1008-261, 265, 1016-252) **Lab 6, Credit 2 (S)**
- 1008-311** **Analytical Chemistry: Instrumental Analysis**  
This course provides an elementary treatment of instrumental theory and techniques; properties of light and its interaction with matter; ultraviolet, visible and infrared absorption spectroscopies; atomic absorption and molecular fluorescence spectroscopy; nuclear magnetic resonance spectroscopy. (Corequisite 1008-318) (1010-252 or 1011-212 or 1011-217) **Class 3, Credit 3 (F, W)**
- 1008-312** **Analytical Chemistry: Separations**  
The theory of current chemical separations methods will be discussed. This will include solvent extraction, planar chromatography, gas chromatography and various mechanisms of high-performance liquid chromatography. Current theory and applications of mass spectroscopy will also be covered. (Corequisite 1008-319) (1008-262 or 1011-217 or equivalent) **Class 3, Credit 3 (S, SU)**
- 1008-318** **Instrumental Analysis Laboratory**  
This lab accompanies 1008-311 and provides quantitative and qualitative experiments in ultraviolet, visible, infrared, fluorescence and atomic absorption spectroscopies. Laboratory report writing is emphasized. (Corequisite 1008-311) (1010-252 or equivalent) **Lab 4, Credit 1 (F, W)**
- 1008-319** **Separations Laboratory**  
This lab accompanies 1008-312 and provides experiments with chemical separations techniques, including extractions (both solution and solid phase), thin-layer chromatography, HPLC, gel filtration, gas chromatography and mass spectroscopy. Laboratory report writing is emphasized. (Corequisite 1008-312) (1008-262 or 1011-217 or equivalent) **Lab 4, Credit 1 (S, SU)**
- 1008-511** **Advanced Instrumental Analysis**  
Theory, applications and limitations of selected instrumental methods in qualitative, quantitative and structural analysis are discussed. Possible topics include electrochemistry, surface analysis, NMR spectroscopy, mass spectroscopy, ICP and other modern instrumentation. (1014-441) **Class 3, Credit 3 (F, W-X\*)**
- 1008-621** **Instrumental Analysis Laboratory**  
This lab is a capstone course requiring students to develop experimental protocols to accomplish assigned experiments involving advanced techniques in instrumental analysis. Library, literature and textbook research will be required. Upon agreement with instructor, two to four major experimental techniques will be required. (Corequisite 1008-511 or 711) (1014-441, 445) **Lab 6, Credit 2 (F, W X\*)**
- 1009-230** **Freshman Symposium for Biochemistry**  
This course will explore biochemistry and related biochemical sciences. It will include discussion of biochemistry-related opportunities including research, co-op, and careers. The biochemistry curriculum and biochemical resources will also be discussed. **Class 1, Credit 1 (F)**
- 1009-300** **Introduction to Biochemistry**  
This course describes the field of biochemistry in relation to the traditional fields of biology and chemistry. Biochemical approaches to problems in medicine, industry and forensics are presented. Students identify a topic of current interest that is related to biochemistry and present it to the class as a skit or dialogue. Issues of ethical concern also are discussed. (1013-231 or 1013-431) **Class 1, Credit 1 (F)**
- 1009-502** **Biochemistry: Conformation and Dynamics**  
This course provides a foundation for the biochemistry course sequence and for participation in undergraduate research in biochemistry. The relationship between the three-dimensional structure of proteins and their function in oxygen transport and enzymatic catalysis is examined. In preparation for the next course in the sequence (1009-503 Biochemistry: Metabolism), membrane structure and the physical laws that apply to metabolic processes are also discussed. (1013-233 or 1013-433, or permission of instructor) **Class 3, Credit 3 (F, W)**
- 1009-503** **Biochemistry: Metabolism**  
Introduction to the metabolic pathways used for energy production and for the synthesis and degradation of the building blocks of living organisms. The pathways are presented individually, then integrated to show the balance between pathways; for example, the products generated by one pathway that are necessary for a second pathway. The efficiency of chemical synthesis in biological organisms is discussed. Finally, the metabolic basis of selected diseases is examined. (1009-502 or permission of the instructor) **Class 3, Credit 3 (F, W)**
- 1009-504** **Biochemistry: Nucleic and Molecular Genetics**  
Nucleic acid structures, including the classical Watson-Crick DNA secondary structure as well as more recently discovered forms, are described. Nucleic acid metabolism and the flow of genetic information, including replication of DNA, its transcription into RNA and the translation of messenger RNA into protein as well as regulation of gene expression in prokaryotes are presented. DNA sequencing and recombinant DNA techniques having practical applications in medicine, agriculture and forensics are described. The nucleic acid biochemistry of viruses and oncogenes is surveyed. (1009-502) **Class 3, Credit 3 (F, S)**
- 1009-505** **Biochemistry: Experimental Techniques**  
An introduction to the theory and practice of modern experimental biochemical laboratory techniques and concepts. The weekly one-hour lecture provides a theoretical framework for the course and includes a discussion of the properties of biomolecules and how those properties are exploited in the separation and characterization of the molecules. Practical laboratory techniques include the preparation of buffers, centrifugation, gel exclusion chromatography, electrophoretic methods, and UV-visible and fluorescence spectrophotometry as applied to the isolation and characterization of proteins and nucleic acids. The manipulation of genetic material in *E. coli* will also be examined. **Class 1, Lab 3, Credit 2 (F, W)**
- 1009-510** **Advanced Protein Biochemistry: Structure and Function**  
In this course, we will analyze protein structure-function relationships. We will investigate how proteins function and how the structure relates to that function. The principles that explain enzyme rate enhancements, mechanistic enzymology will be examined. We will also explore protein superfamilies for phylogenetic relationships to enhance our understanding of protein structure-function relationships. We will do this by reading and discussing current scientific literature and classic papers. (1009-502) **Class 3, Credit 3 (S)**
- 1009-541** **Biochemistry Research**  
Faculty-directed student projects or research in biochemistry, usually involving laboratory work and/or calculations that would be considered original. (Permission of research adviser) **Class variable, Credit variable (F, W, S, SU)**
- 1009-542** **Biochemistry Research**  
Faculty-directed student projects or research in biochemistry, usually involving laboratory work and/or calculations that would be considered original. (Permission of research adviser) **Class variable, Credit variable (F, W, S, SU)**
- 1009-543** **Biochemistry Research**  
Faculty-directed student projects or research in biochemistry, usually involving laboratory and/or calculations that would be considered original. (Permission of research adviser) **Class variable, Credit variable (F, W, S, SU)**
- 1009-561** **Advanced Biochemistry Research I**  
Student research in biochemistry, usually involving laboratory work and/or other types of scholarship that would be considered original. (Permission of research adviser) **Class variable, Credit variable (F, W, S, SU)**
- 1009-562** **Advanced Biochemistry Research II**  
Student research in biochemistry, usually involving laboratory work and/or other types of scholarship that would be considered original. (Permission of research adviser) **Class variable, Credit variable (F, W, S, SU)**
- 1009-563** **Advanced Biochemistry Research III**  
Student research in biochemistry, usually involving laboratory work and/or other types of scholarship that would be considered original. (Permission of research adviser) **Class variable, Credit variable (F, W, S, SU)**

\*X, extended day (after 5 p.m.)

- 1009-594** **Molecular Modeling and Proteomics**  
The course will explore two facets of protein molecules: their structure and their expression. The structure component will build upon information from the biochemistry prerequisite course and will add further sophistication with analysis of inter-molecular interactions and ligand/receptor pairing. Software that permits molecular docking experiments will be employed. Tissue-specific protein expression will be addressed in lectures with description of micro-array technology and, in the laboratory, with two-dimensional protein gel electrophoresis. Course cannot be taken by students who have credit for 1001-494, 1001-794 or 1009-794. (1009-502, 503, or equivalent) **Class 3, Lab 3, Credit 4 (S)**
- 1010-200** **Chemistry Safety**  
A basic course in safe chemical laboratory practices. Topics include protective equipment; toxicity; safe reaction procedures; storage and disposal methods; and handling of all chemicals, including flammable materials, compressed gases, cryogenics, radioactive materials and other special chemicals. **Class 1, Credit 1 (F)**
- 1010-230** **Introduction to Co-op Seminar**  
Exploration of cooperative education opportunities with practice in writing letters of application and résumés and in interviewing techniques. Careers related to chemistry, polymer chemistry, biochemistry and environmental chemistry option are discussed. RIT co-op and career placement services are utilized. **Class 1, Credit 1 (F)**
- 1010-251** **General Chemistry I**  
This course is designed for chemistry department majors and includes topics on measurement, atomic theory, periodicity, moles and stoichiometry, solutions, titrations, redox reactions, gas laws, kinetic theory of gases and LeChatelier's principle. (Corequisite 1010-255) **Class 3, Recitation 1, Credit 4 (F)**
- 1010-252** **General Chemistry II**  
This course is designed for chemistry department majors and includes topics on atomic theory and electronic structure, chemical bonding, VSEPR and valence bond theory, molecular orbital theory, enthalpy and entropy, rate laws, catalysis and nuclear chemistry. (Corequisite 1008-265) (1010-251) **Class 3, Credit 3 (W)**
- 1010-255** **General Chemistry I Laboratory**  
This laboratory is designed for chemistry department majors to complement General Chemistry I (1010-251). Experiments involve exploration of various topics and applications of chemistry, including but not limited to biochemistry, physical chemistry, synthetic chemistry, inorganic chemistry and forensic chemistry. Students are given unique problems to solve using the skills developed in the course. (Corequisite 1010-251) **Lab 3, Credit 1 (F)**
- 1010-401** **Chemical Literature**  
Instruction is given on the use of chemical literature resources such as Chemical Abstracts, Science Citation Index, Beilstein, Current Contents and Computerized Information Retrieval. Students prepare a library-based research paper and poster on a chemical topic of their choice as a culmination of instruction on planning a research paper: outlining, using correct scientific English and formats for documentation (footnotes, endnotes, bibliographies), preparing visuals, abstracts and letters of transmittal. **Class 2, Credit 2 (F, W)**
- 1010-480** **Laboratory Teaching Experience**  
This course is designed to offer students teaching experience in an undergraduate laboratory setting. Evaluation by a faculty supervisor is based on teaching performance and preparation of materials required for the lab. (Must have completed the course and laboratory or equivalent experience under consideration with a grade of A or B; permission of instructor/laboratory coordinator and department head) **Class 3-6, Credit 1-2 (F, W, S, SU)**
- 1010-499** **Chemistry Co-op**  
Cooperative education experience for undergraduate chemistry students. **Credit 0 (offered every quarter)**
- 1010-541** **Chemical Research**  
Faculty-directed student projects or research usually involving laboratory work and/or calculations that would be considered original. (Permission of research adviser) **Class variable, Credit variable (F, W, S, SU)**
- 1010-542** **Chemical Research**  
Faculty-directed student projects or research usually involving laboratory work and/or calculations that would be considered original. (Permission of research adviser) **Class variable, Credit variable (F, W, S, SU)**
- 1010-543** **Chemical Research**  
Faculty-directed student projects or research usually involving laboratory and/or calculations that would be considered original. (Permission of research adviser) **Class variable, Credit variable (F, W, S, SU)**
- 1010-559** **Special Topics: Undergraduate Chemistry**  
Courses in which topics of special interest to a sufficiently large group of students, and not covered in other courses, may be offered upon request. **Class variable, Credit variable (offered upon sufficient request)**
- 1010-561** **Advanced Undergraduate Chemistry Research 1**  
Course provides an opportunity for undergraduates to participate in a research project with chemistry faculty requiring a more formalized presentation of results than the 1009-541 or 1010-541 series. Results from the research must be reported in a public forum (such as a written report, poster and/or oral presentation) as determined by the research adviser and the head of the department of chemistry. (Permission of the research adviser and approval by the head of the department of chemistry) **Class/lab variable, Credit variable (F, W, S, SU)**
- 1010-562** **Advanced Undergraduate Chemistry Research 2**  
Course provides an opportunity for undergraduates to participate in a research project with chemistry faculty requiring a more formalized presentation of results than the 1009-541 or 1010-541 series. Results from the research must be submitted in a formal report following American Chemical Society guidelines. Public presentations of results, such as a poster or oral presentation, may also be required by the research adviser and the head of the department of chemistry. (Permission of the research adviser and approval by the head of the department of chemistry) **Class/lab variable, Credit variable (F, W, S, SU)**
- 1010-563** **Advanced Undergraduate Chemistry Research 3**  
Course provides an opportunity for undergraduates to participate in a research project with chemistry faculty requiring a more formalized presentation of results than the 1009-541 or 1010-541 series. Results from the research must be submitted in a formal written report following American Chemical Society guidelines. Public presentation of results, such as a poster or oral presentation, may also be required by the research adviser and the head of the department of chemistry. (Permission of research adviser and approval by the head of the department of chemistry) **Class/lab variable, Credit variable (F, W, S, SU)**
- 1010-599** **Chemistry Independent Study: Undergraduate**  
Faculty-directed study of appropriate topics on a tutorial basis. Enables an individual to pursue studies of existing knowledge available in the literature. (Permission of independent study adviser) **Class variable, Credit variable (F, W, S, SU)**
- 1011-201** **Survey of General Chemistry**  
A survey course in general chemistry. Fundamentals include dimensional analysis; matter and energy; atomic theory; molecular structure; chemical bonding; chemical reactions; solution chemistry; and the Gas Laws. The material will emphasize the relationship between chemistry and modern sociological, nutritional and environmental issues. (Credit or co-registration in 1011-205) **Class 4, Credit 4 (F, W)**
- 1011-202** **Survey of Organic Chemistry**  
A survey course in organic chemistry. Fundamentals include reaction rates, equilibrium and acid/base chemistry. Organic functional groups covered include hydrocarbons, alcohols, carbonyls and amines. The course will familiarize the students with the relationship between organic chemistry and modern pharmaceutical, nutritional and environmental issues. (Credit or co-registration in 1011-207) **Class 4, Credit 4 (W, S)**
- 1011-203** **Survey of Biochemistry**  
A survey course in biochemistry; covers application of carbohydrates, lipids, proteins and amino acid metabolism to nutrition and health. The roles of DNA, RNA and proteins are investigated. The relationship of fundamental biochemical topics to nutrition and energy will be discussed. (1011-202) **Class 3, Credit 3 (S)**
- 1011-205** **Chemistry Principles I Laboratory**  
Laboratory course to introduce basic laboratory techniques: gravimetric, volumetric, thermal and titration analyses. Experiments complement material in first-quarter lecture. Also offered in distance-learning format. (Corequisite 1011-201, 211, 215, or 271) **Lab 3, Credit 1 (F, W, S, SU)**

- 1011-206** **Chemistry Principles II Laboratory**  
Laboratory course to introduce techniques of chemical analysis: spectrometry, calorimetry, separations, reaction schemes, titrations and kinetic studies. Experiments complement material in second quarter lecture. Also offered in distance-learning format. (Corequisite 1011-212 or 216) (1011-205) **Lab 3, Credit 1 (F, W, S, SU)**
- 1011-207** **Introduction to Organic Chemistry Laboratory**  
An introduction to organic laboratory techniques. Methods of separating, purifying and characterizing organic compounds are covered. Also offered in distance-learning format. (Corequisite 1011-202 or 213) (1011-205) **Lab 3, Credit 1 (W, S, SU)**
- 1011-208** **College Chemistry**  
This course is primarily for, but not limited to, engineering students. Topics include an introduction to some basic concepts in chemistry, stoichiometry, First Law of Thermodynamics, thermochemistry, electronic theory of composition and structure, chemical bonding. **Class 4, Credit 4 (F, W, S)**
- 1011-215** **General and Analytical Chemistry I**  
This is a general chemistry course for students in the life and physical sciences. College chemistry is presented as a science based on empirical evidence that is placed in the context of conceptual, visual and mathematical models. Students will learn the concepts, symbolism and fundamental tools of chemistry necessary to carry on a discourse in the language of chemistry. Emphasis will be on the relationship between atomic structure, chemical bonds and the transformation of these bonds through chemical reactions. (Corequisite 1011-205) **Class 4, Credit 4 (F)**
- 1011-216** **General and Analytical Chemistry II**  
This course covers the relationship between chemical structure, energetics and kinetics. Chemical structure is treated through an introduction to organic compounds. The course then deals with the energy and entropy changes that drive chemical reactions. After a brief coverage of the rates of reactions the course finishes with an introduction to chemical equilibrium. (1011-215, corequisite 1011-206) **Class 3, Credit 3 (W)**
- 1011-217** **General and Analytical Chemistry III**  
Comprising 80 percent of our bodies and 2/3 of the Earth's surface, water is arguably the most important compound. This course uses the tools and concepts introduced in the previous two courses of the sequence to focus on the chemistry of aqueous solutions. It takes a quantitative look at solubility equilibrium, acid-base equilibrium, and oxidation-reduction equilibrium to illustrate the importance of the interaction of ions in aqueous solutions. (1011-216, corequisite 1011-227) **Class 3, Credit 3 (S)**
- 1011-227** **General and Analytical Chemistry III Laboratory**  
This is a continuation of 1011-206 laboratory. Topics include quantitative analysis of a multicomponent mixture using complexation and double endpoint titration, pH measurement, buffers and pH indicators, and the electrochemical analysis of osmosis and oxidation reduction reactions. Experiments are designed to complement lecture material of 1011-217. The course emphasizes the use of experiments as a tool for chemical analysis. (1011-206, corequisite 1011-217) **Class 3, Credit 1 (S)**
- 1011-230** **Principles of Chemistry I**  
This course offers a rigorous, in-depth study of general chemistry in a distance-learning format. This distance learning format will provide excellent value for the self-directed and self-disciplined student. Topics include atomic structure, chemical bonding, chemical equations and quantitative analysis, acid-base and redox chemistry, periodic chemical trends, and molecular geometry. The course can be taken in lieu of 1011-208, 215 or 271. (Corequisite 1011-205) **Class 3, Credit 3 (W, S, SU)**
- 1011-231** **Principles of Chemistry II**  
This course is a continuation of 1011-230, maintaining the same rigor and focusing on some of the more physical aspects of reactions as chemical equilibrium is approached. The course includes the study of the three phases (gases, liquids, and solids), enthalpy and entropy as chemical driving forces, the rates of chemical reactions and an advanced treatment of the atomic nucleus and subatomic particles. The course can be taken in lieu of 1011-216 or 273 and is offered only in distance-learning format. This format provides excellent value for the self-directed and self-disciplined student. (Corequisite 1011-206) (1011-230) **Class 3, Credit 3 (F, S, SU)**
- 1011-232** **Principles of Chemistry III**  
This course is a continuation of 1011-231, maintaining the same rigor and in-depth approach. It provides opportunity for application of equilibrium and redox concepts towards familiar chemical systems such as acids and bases, buffers, sparingly soluble solids and galvanic cells (batteries). The course also provides solid introductions to organic chemistry and the chemistry of metals. The course can be taken in lieu of 1011-217 and is offered only in distance-learning format. This format provides excellent value for the self-directed and self-disciplined student. (Corequisite 1011-207) (1011-231) **Class 3, Credit 3 (F, SU)**
- 1011-271** **Fundamentals of Chemistry**  
This is an introduction to basic concepts of chemistry, assuming no prior experience. Topics include atomic theory, chemical bonding, stoichiometry, states of matter and the periodic table. The online course 1011-211 can be used as a substitute for 1011-271. (Corequisite 1011-205) **Class 3, Credit 3 (F, W, SU)**
- 1011-272** **Chemistry of Water and Waste Water**  
This course discusses the chemistry of water analyses, including solids, pH, alkalinity, acidity chloride, phosphate, BOD, COD, nitrogen, metals, radioactivity, residual chlorine and chlorine demand. Polymers are also covered. (Corequisite 1011-276) (1011-271 or equivalent) **Class 3, Credit 3 (F)**
- 1011-273** **Introduction to Chemical Materials**  
This course applies the basic concepts of chemistry to energy conversion (thermochemistry, nuclear chemistry), reaction kinetics and equilibria, electrochemistry and materials (metals, ceramics and polymers). The online course 1011-212 can be used as a substitute for 1011-273. (1011-271 or 1011-208, corequisite 1011-277) **Class 3, Credit 3 (W, S, SU)**
- 1011-276** **Chemistry of Water and Waste Water Laboratory**  
This laboratory is to be taken concurrently with 1011-272. Techniques used in water and waste water analysis are covered. (1011-271 or equivalent) **Lab 3, Credit 1 (F)**
- 1011-277** **Introduction to Chemical Materials Laboratory**  
Experiments in thermochemistry, kinetics, equilibrium, oxidation reduction and the properties of matter that complement the lecture material. (1011-205 or 1011-208, corequisite 1011-273) **Lab 3, Credit 1 (W, S, SU)**
- 1012-562** **Inorganic Chemistry I**  
For common elements, mastery of chemical reactions that describe their isolation, characteristic chemical reactivities with other common reagents, use in nano-structured materials, large-volume industrial processes, and environmental impacts is required. Nomenclature and isomerism are included. (1013-433, 1014 441) **Class 4, Credit 4 (F, W)**
- 1012-563** **Inorganic Chemistry II**  
This course provides a view of how bonding theories endeavor to account for and predict the physical properties of a wide variety of inorganic compounds; e.g., color, magnetism, stability, chemical potential and electrical conductivity. Applications of bonding theory to current research areas are included. (1012-562, 1014-442 or permission of instructor) **Class 4, Credit 4 (S)**
- 1012-564** **Modern Inorganic Chemistry**  
This course introduces the more sophisticated tools with which an inorganic chemist investigates inorganic molecules and materials. These physical methods are applied to current research directions in the field. An oral presentation is required. (1014-441) **Class 4, Credit 4 (S)**
- 1012-565** **Preparative Inorganic Chemistry Laboratory**  
In this laboratory, the chemistries of different areas of the periodic table are examined; advanced synthetic and characterization methods are utilized. (1012-562 or permission of instructor) **Recitation 1, Lab 7, Credit 3 (W)**
- 1013-231** **Organic Chemistry I**  
This course is a survey of the structure, nomenclature, reactions and synthesis of the major functional groups. (Corequisites 1013-235) (1011-212 or 216 or permission of instructor) **Class 3, Credit 3 (F, W, X\*, SU)**
- 1013-232** **Organic Chemistry II**  
In this course the mechanisms of main classes of reactions are discussed. (1011-231, corequisite 1013-236) **Class 3, Credit 3 (W, S, X\*, SU)**

\*X, extended day (after 5 p.m.)

- 1013-233** **Organic Chemistry III**  
Structure, nomenclature, reactions and properties of the important classes of bio-organic molecules (carbohydrates, lipids, amino acids, proteins and nucleic acids) are covered in depth. Emphasis is on structure and reactivity in relation to biochemical processes. (1013-232, corequisite 1013-237) **Class 3, Credit 3 (S, F-X\*)**
- 1013-235** **Organic Chemistry Laboratory I**  
Laboratory work emphasizes techniques, preparations and analyses. (Corequisite 1013-231) **Lab 3, Credit 1 (F, W-X\*, SU)**
- 1013-236** **Organic Chemistry Laboratory II**  
Laboratory work emphasizes techniques, preparations, and analyses. (Corequisite 1013-232) **Lab 3, Credit 1 (W, S-X\*, SU)**
- 1013-237** **Organic Chemistry Laboratory III**  
Laboratory work emphasizes reactions and properties of biomonomers and polymers. (Corequisite 1013-233) **Lab 3, Credit 1 (S, F-X\*)**
- 1013-431** **Organic Chemistry I**  
This course is a rigorous survey of the mechanisms and reactions of organic functional groups, emphasizing alkanes, alkenes and alkynes. Stereochemistry is also included. (1010-252, corequisite 1013-435) **Class 3, Credit 3 (F)**
- 1013-432** **Organic Chemistry II**  
This course is a continued survey of reactions and mechanisms of organic functional groups, including aromatic compounds, alcohols, ethers, aldehydes and organometallics. Spectral analysis (IR, UV, NMR) is also included. (1013-431, corequisite 1013-436) **Class 3, Credit 3 (W)**
- 1013-433** **Organic Chemistry III**  
This course is a continued survey of reactions of major organic functional groups, including carboxylic acids, carboxylic acid derivatives, amines and enolate anions. Structure, nomenclature, reactions and properties of important classes of bio-organic molecules are also included. (1013-432, corequisite 1013-437) **Class 3, Credit 3 (S)**
- 1013-435** **Preparative Organic Chemistry I Laboratory**  
This laboratory is designed for chemistry department majors to complement 1013-431 Organic Chemistry I. Synthesis, purification and characterization of organic compounds are conducted. (1010-252, corequisite 1013-431) **Lab 4, Credit 1 (F)**
- 1013-436** **Preparative Organic Chemistry II Laboratory**  
This laboratory is designed for chemistry department majors to complement 1013-432, Organic Chemistry II. Emphasis is on synthesis, functional group reactivities, separations, IR and NMR analysis and introduction to microscale synthesis. (1013 431, corequisite 1013-432) **Lab 4, Credit 1 (W)**
- 1013-437** **Systematic Identification of Organic Compounds**  
This is a laboratory course utilizing synthesis, chemical and spectral (IR, NMR and GC/MS) techniques to identify and characterize organic compounds. (Should be taken concurrently with 1013-433) (1008-319, 1013- 432, 436) **Lab 6, Credit 2 (S)**
- 1013-537** **Advanced Organic Chemistry Synthesis**  
This course will revisit undergraduate organic chemistry topics at a more advanced level with specific examples from the current chemical literature. Multistep synthesis and synthesis of complex multifunctional molecules will be emphasized. (Students requiring 4 credits should register for 1013-737.) (1013-433) **Class 3, Credit 3 (F-X\*)**
- 1014-441** **Chemical Thermodynamics**  
Properties of gases; temperature; energy and the First Law of Thermodynamics; entropy and the Second and Third laws; Helmholtz and Gibbs free energies; criteria for equilibrium and spontaneity; chemical equilibrium; phase equilibrium; equilibrium in ideal and non-ideal solutions; and electrochemistry are discussed. (1010-252, 1016-282, 1017-211 or 311, corequisite 1014-445) **Class 4, Credit 4 (F, W-X\*)**
- 1014-442** **Quantum Chemistry**  
This course is an introduction to quantum mechanics and spectroscopy; Planck's Law; photoelectric effect; the Bohr atom; deBroglie, Schrodinger and Heisenberg theories; eigenvalue/eigenfunction equations; variation and perturbation theory; quantum statics; Heitler-London theory of covalent bonds; selection rules and spectroscopy; and matrices applicable to quantum chemistry. (1014-441, 1016-306, corequisite 1014-446) **Class 4, Credit 4, (W, S X\*)**
- 1014-443** **Chemical Kinetics**  
Kinetic molecular theory, transport properties of gases, chemical kinetics, surface chemistry, photochemical kinetics, irreversible processes in solution and an introduction to statistical mechanics are discussed. (1014-441, corequisite 1014-447) **Class 4, Credit 4 (S)**
- 1014-445** **Chemical Thermodynamics Laboratory**  
This is an introduction to physical chemistry laboratory; chemical thermodynamics and equilibrium. (Should be taken concurrently with 1014-441) **Lab 3, Credit 1 (F, W-X\*)**
- 1014-446** **Quantum Chemistry Laboratory**  
Experiments in the application of quantum chemistry, atomic and molecular spectroscopy are performed. (Should be taken concurrently with 1014-442) **Lab 3, Credit 1 (W, S-X\*)**
- 1014-447** **Chemical Kinetics Laboratory**  
Laboratory experiments in chemical dynamics are conducted. (Should be taken concurrently with 1014-443) **Lab 3, Credit 1 (S)**
- 1015-520** **Environmental Chemistry**  
Students will be introduced to sources, reactions, transport, effects and fate of chemical species in air, soil, water and living systems. (Organic chemistry) **Class 3, Credit 3 (S-X\*)**
- 1015-521** **Atmospheric Chemistry**  
This course is an overview of the major forces controlling the chemical composition of Earth's atmosphere with emphasis on the role of the biosphere and the changes induced by human activity. Emphasis is on urban pollution, acid rain, stratospheric ozone depletion and climate change. (1014-443) **Class 3, Credit 3 (S-X\*)**
- 1015-522** **Aquatic Toxicology and Chemistry**  
This course is an introduction to key chemical, biological, microbiological and toxicological concepts and processes that govern the presence and fate of pollutants in the aquatic environment; environmental fate of specific inorganic, organic and pathogenic pollutants; analytical testing and modeling methods used to assess the toxicity impact of aquatic pollutants. (Organic chemistry, 1001-201) **Class 3, Credit 3 (S-X\*)**
- 1029-301** **Introduction to Polymer Technology**  
This course is a survey of polymer science, including terminology, synthesis, structures, properties, applications and processing techniques of commercially significant polymers. (General chemistry, 1016-251 or equivalent) **Class 2, Credit 2 (F)**
- 1029-501** **Organic Chemistry of Polymers**  
The synthesis of high molecular weight organic polymers and their properties is introduced. Mechanisms of step growth and chain growth polymerization reactions, polymer reactions and degradation are also considered. The end properties of polymers can be "tailored" by their method of synthesis. Controlled synthesis is particularly achievable when using coordinative polymerization, which will be discussed in detail. (1013-433) **Class 4, Credit 4 (F-X\*)**
- 1029-502** **Polymer Chemistry: Chains and Solutions**  
Although most polymeric materials find utility as solids, polymer fabrication and characterization techniques are general liquid-phase processes. This course is concerned with the fundamental physical chemistry of polymers in liquid solutions. Topics to be addressed include polymerization kinetics and chain structure, molecular weight distributions and determination, polymer solution thermodynamics and transport phenomena, and solution phase transitions. The study of polymeric solids is the focus of 1029-503 Polymer Chemistry: Properties of Bulk Materials. (1029-301, 1014-442) **Class 4, Credit 4 (S-X\*)**
- 1029-503** **Polymer Chemistry: Properties of Bulk Materials**  
This course is designed to give the student with a chemistry or materials science background a thorough grounding in the main concepts that describe bulk polymer structure, behavior and properties. The course follows a synthetic path; the structure property relationships for polymeric materials are built up from a microscopic to a macroscopic level. One of the most important lessons of the course is that polymers are almost never in a thermodynamically stable state. Consequently, the behavior of polymers and the properties they display are time dependent and vary with the thermo-mechanical history of the materials. (1029-501, 502) **Class 4, Credit 4 (F-X\*)**

\*X, extended day (after 5 p.m.)

**1029-504 Polymer Characterization Laboratory**  
This course introduces, and gives the student experience with, analytical techniques commonly employed to characterize high polymers. To accomplish this, the course is divided into five sections, each highlighting a particular characteristic of polymeric materials: molecular weight distributions; spectroscopic analysis of chemical structure; thermal stability; morphology and phase transitions, and mechanical properties. The experiments, each requiring eight lab hours to complete, are designed to give students exposure to laboratory techniques not generally covered in undergraduate science/engineering curriculum. Although the documentation of experimental results is important, and will be evaluated, the main purpose is to give the student hands-on experience, hopefully piquing his/her interest in and enthusiasm for the field. (1008-319, 1029-301) **Lab 6, Credit 2 (offered alternate years) (S)**

**1029-505 Synthesis of High Polymers Laboratory**  
Students will carry out about eight experiments. They will conduct in about half of those experiments step-growth polymerizations and in the other half chain-addition polymerizations. Among the polymers produced will be Nylon 6-10, Nylon 11, polystyrene, high-density polyethylene, linear low-density polyethylene, copolymer of styrene and methyl methacrylate and polyurethane. The most specific types of polymerizations and reactions introduced will be cross-linking polymer, interfacial and bulk step-growth polymerizations, cyclopolymerization, radical, ionic, and coordinative chain polymerizations. Instructors may add or delete polymer-related experiments of their choice. Experiments also include basic characterization of products by at least one method. (1013-437) **Lab 6, Credit 2 (offered alternate years) (F)**

## Mathematics and Statistics

**1016-200 Algebra**  
This is an algebra course including such topics as operations involving polynomials, algebraic fractions, factoring, exponents and radicals, solution of linear and quadratic equations, and graphing linear equations. (One year of high school algebra) **Class 4, Credit 4 (F, W, S)**

**1016-204 College Algebra and Trigonometry**  
This course prepares students to enter an introductory-level calculus course. Topics in this course include a review of the fundamentals of algebra; solution of linear, fractional and quadratic equations; functions and their graphs; polynomial, exponential, logarithmic and trigonometric functions; systems of linear equations. (Two years of high school algebra) **Class 4, Credit 4 (F, W, S, SU)**

**1016-205 Discrete Math for Information Technology I**  
This course is an introduction to topics of discrete mathematics for students of information technology, including number systems, sets and logic, counting and matrices. (1016-204 or equivalent) **Class 4, Credit 4 (F, W, S, SU)**

**1016-206 Discrete Math for Information Technology II**  
This course is a continuation of an introduction to topics of discrete mathematics for students of information technology, including relations, Boolean algebra, graph theory and regular sets. (1016-205 or 1016-265, or equivalent) **Class 4, Credit 4 (F, W, S, SU)**

**1016-210 Mathematics Seminar**  
This is an introductory course for freshmen and some transfers that explores the three majors and shows typical problems that applied mathematicians, computational mathematicians and applied statisticians solve in academic and industrial settings. **Class 1, Credit 1 (F)**

**1016-211 Mathematics Seminar II**  
This is a continuation of 1016-210 with three to four weeks spent on an introduction to co-op and five to six weeks spent introducing the types of technical writing mathematicians and statisticians do. Students will model and write about a mathematical problem at the calculus level. **Class 1, Credit 1 (W)**

**1016-214 Elementary Calculus I**  
This course is an introduction to the study of differential calculus. The following topics are covered: functions and graphs, limits, continuity, the derivative concept, derivative formulas and applications of derivatives, with an emphasis on manipulative skills. (1016-204 or equivalent) **Class 3, Credit 3 (W)**

**1016-215 Elementary Calculus II**  
This course is a continuation of 1016-214, with an emphasis on an introduction to integral calculus. The major topics covered are the definite integral, the fundamental theorem of calculus, techniques of integral approximation, exponential and logarithmic functions, techniques of integration, an introduction to differential equations, and geometric series. Various applications relevant to the students' majors are made throughout the development of these topics. (1016-214 or equivalent) **Class 3, Credit 3 (S)**

**1016-225 Algebra for Management Science**  
This course is an introduction to functions, including linear, quadratic, polynomial, exponential, logarithmic and rational functions, with applications to supply and demand, cost, revenue and profit functions. Additional topics include matrices, linear programming and mathematics of finance. (Three years of high school mathematics) **Class 4, Credit 4 (F, W, S)**

**1016-226 Calculus for Management Science**  
This course stresses applications of calculus concepts to solving problems in business and allied health. Topics include the limit concept, differentiation, partial differentiation and integration. (1016-225) **Class 4, Credit 4 (F, W, S, SU)**

**1016-230 Precalculus for Engineering Technology**  
The course covers a study of functions and their graphs, concentrating on a thorough coverage of trigonometric functions and preparing students to start their study of calculus and its applications. (Three years of high school mathematics) **Class 3, Workshop 1, Credit 4 (F, W)**

**1016-231 Calculus for Engineering Technology I**  
This is the first course in the sequence of two courses. Topics covered in this course include limits, derivatives, indefinite and definite integrals, and numerical approximation. Applications to physical and engineering technology problems are emphasized. (Grade of C or better in 1016-230 or a score greater than 55 percent and less than 75 percent on the placement exam) **Class 3, Workshop 1, Credit 4 (F, W, S)**

**1016-232 Calculus for Engineering Technology II**  
This is a continuation of 1016-231. Topics covered in this course are applications of the integral calculus, differential and integral calculus of the transcendental functions, and basic techniques of integration with emphasis on applications to engineering technology problems. (Grade of C or better in 1016-231) **Class 3, Workshop 1, Credit 4 (F, W, S)**

**1016-258 Introduction to Symbolic Computing**  
This is an introduction to a symbolic computing language and the uses and applications in several undergraduate courses. Symbolic manipulations, numerical calculations and graphics techniques are explored as well as programming techniques. (Corequisite is a basic calculus course such as 1016-281, 1016-231, 1016-271 or 1016-214) **Class 2, Credit 2 (S)**

**1016-260 Statistical Computing with Excel and Minitab**  
This course is an introduction to statistical computing using Excel and Minitab software packages. (Permission of instructor) **Class 2, Credit 2 (S)**

**1016-261 Calculus with Foundations I**  
This course integrates the learning of calculus concepts with precalculus. A study of functions, particularly polynomial and rational functions, their graphical representations and algebraic manipulation, is covered. Limits of functions, one-sided limits, continuity, and derivatives, including basic rules of differentiation, chain rule and implicit differentiation of polynomials and rational functions, are also part of this course. (Two years of high school mathematics and a score greater than 35 percent and less than 55 percent on the placement exam) **Class 3, Workshop 1, Credit 4 (F, W)**

**1016-262 Calculus with Foundations II**  
This is the second course in the sequence that integrates the learning of calculus concepts with precalculus. Related rates, the Mean Value Theorem, and a study of trigonometric functions and their graphical representations and algebraic manipulation, and their differential calculus are covered. (A grade of C or better in 1016-261) **Class 3, Workshop 1, Credit 4 (W, S)**

**1016-265 Discrete Mathematics I**  
This course is an introduction to discrete mathematics with applications in computer science and mathematics with an emphasis on proof techniques. Sets, functions, the natural numbers, the integers modulo  $n$ , and simple combinatorics are covered. (Corequisite 1016-272 or 1016-282 or permission of instructor) **Class 4, Credit 4 (F, W, S, SU)**



- 1016-271** **Calculus A**  
This is the first course in the sequence of four courses. The first three courses in this sequence cover the equivalent of Calculus I and II, with algebra and trigonometry inserted into the curriculum in a “just in time” fashion. The course consists of a study of functions, continuity and differentiability. The study of functions includes the definition, representations and the trigonometric functions. Limits of functions are used to study continuity and differentiability. The study of the derivative includes the definition, the basic rules, including the chain rule, implicit differentiation and the Mean Value Theorem. Applications of the derivative include problems in related rates. (Three years of high school mathematics and a score between 55 percent and 75 percent on the placement exam) **Class 4, Workshop 2, Credit 4 (F, W, S)**
- 1016-272** **Calculus B**  
This is the second course in the sequence of four courses. The first three courses in this sequence cover the equivalent of Calculus I and II, with algebra and trigonometry inserted into the curriculum in a “just in time” fashion. The course consists of a study of applications of differentiation to curve sketching, optimization problems, Newton’s method, and linear approximations. The course also covers antidifferentiation, including substitution and numerical integration, the Fundamental Theorem of Calculus, and the calculus of the natural logarithmic function. (Grade of C or better in 1016-271 Calculus A or in 1016-262 Calculus with Foundations II) **Class 4, Workshop 2, Credit 4 (F, W, S)**
- 1016-273** **Calculus C**  
This is the third course in a sequence of four courses. The first three courses cover the equivalent of Calculus I and II, with algebra and trigonometry inserted into the curriculum in a “just in time” fashion. The course consists of a study of techniques of integration and applications of the definite integral. The techniques of integration include substitution, integration by parts and partial fractions. The applications of the definite integral include volumes, work, arc length, moments and center of mass. The course also covers the calculus of exponential and inverse trigonometric functions as well as indeterminate forms and improper integrals. (Grade of C or better in 1016-272 Calculus B) **Class 4, Workshop 2, Credit 4 (F, W, S)**
- 1016-274** **Calculus D**  
This is the fourth course in the sequence of four courses. The first three courses in this sequence cover the equivalent of Calculus I and II, with algebra and trigonometry inserted into the curriculum in a “just in time” fashion. This course covers the study of sequences, infinite series, power series, Taylor polynomials, and Taylor and Maclaurin series as well as representations of functions by power series. A study of parametric equations, polar coordinates, computation of areas in polar coordinates and a basic introduction to separable differential equations is also a part of this course. (Grade of C or better in 1016-273) **Class 4, Workshop 2, Credit 4 (F, W, S)**
- 1016-281** **Project-Based Calculus I**  
Project-based Calculus I-III is a standard first course in calculus intended for students majoring in mathematics, science or engineering with the major emphasis on understanding the concepts and using them to solve a variety of physical problems. Project-based Calculus I covers two-dimensional analytic geometry, functions, limits, continuity, the derivative and its formulas, and applications of the derivative. (Three years of high school mathematics and a grade of 75 percent or higher on the placement exam) **Class 4, Workshop 2, Credit 4 (F, W)**
- 1016-282** **Project-Based Calculus II**  
Project-based Calculus I-III is a standard first course in calculus intended for students majoring in mathematics, science or engineering with the major emphasis on understanding the concepts and using them to solve a variety of physical problems. Project-based Calculus II covers optimization problems and Newton’s method, integral calculus and techniques of integration with emphasis on applications of integration. (Grade of C or better in 1016-281) **Class 4, Workshop 2, Credit 4 (F, W, S)**
- 1016-283** **Project-Based Calculus III**  
Project-based Calculus I-III is a standard first course in calculus intended for students majoring in mathematics, science or engineering with the major emphasis on understanding the concepts and using them to solve a variety of physical problems. Major themes for Calculus III are learning how to represent functions by infinite series, studying the concepts of convergence and divergence of series, solving basic differential equations and learning how to use series to solve differential equations. (Grade of C or better in 1016-282) **Class 4, Workshop 2, Credit 4 (F, W, S)**
- 1016-289** **Contemporary Science: Mathematics**  
A basic survey of mathematical structures as well as an introduction to problem solving. Topics are chosen from foundations of mathematics, algebra, topology, number theory, graph theory, probability and statistics. These structures are examined as they occur naturally in modern settings. NOTE: Not acceptable as science credit for College of Science majors. **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-304** **Differential Equations for Engineering Technology**  
This course is a continuation of 1016-232. Course covers selected applied mathematics topics, including differential equations, Laplace transforms, numerical methods and the calculus of functions of two variables. Emphasis is on the application of these topics to engineering technology problems. (1016-232 or equivalent) **Class 4, Credit 4 (F, W, S)**
- 1016-305** **Multivariable Calculus**  
This course is a study of the calculus of functions of two or more variables, including limits and partial derivatives of these functions, as well as a study of three-dimensional analytic geometry and vector algebra, and multiple integrals with applications in engineering and science. (Grade of C or better in 1016-273 or 1016-282) **Class 4, Credit 4 (F, W, S, SU)**
- 1016-306** **Differential Equations I**  
This course is an introduction to the study of ordinary differential equations and their applications. Topics include solutions to common first-order equations and linear second-order equations, method of undetermined coefficients, variation of parameters, linear independence and the Wronskian numerical solution techniques, vibrating systems and Laplace transforms. (1016-283 or 1016-274) **Class 4, Credit 4 (F, W, S, SU)**
- 1016-307** **Differential Equations II**  
This is a second-quarter course in ordinary differential equations that includes power series solutions to ordinary differential equations about ordinary and regular singular points; orthogonal polynomials; solution of systems of linear differential equations; phase plane analysis, stability and chaos. (1016-305, 306) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-314** **Engineering Statistics**  
Basic statistical concepts, including descriptive statistics, probability, inference and quality control are covered in this course. The statistical package Minitab will be used to reinforce these techniques. The focus of this course is on statistical applications and quality improvement in engineering. This course is intended for engineering programs and has a calculus prerequisite. NOTE: This course may not be taken for credit if credit is to be earned in 1016-319. (1016-283 or 1016-274) **Class 4, Credit 4 (F, W, S)**
- 1016-318** **Matrices and Boundary Value Problems**  
This course is an introduction to matrix algebra and boundary value problems. Topics include matrix operations with applications to the solution of linear systems of algebraic equations, Fourier series, separation of variables, the heat equation and the wave equation. Matrix algebra material should be covered first. (1016-305, 306) **Class 4, Credit 4 (F, S, SU)**
- 1016-319** **Data Analysis I**  
This course will study the statistical principles of presenting and interpreting data. Topics covered will include descriptive statistics and displays, random sampling, the normal distribution, confidence intervals and hypothesis testing. The statistical software package Minitab will be used to reinforce these principles and to introduce students to the use of technology in statistical analysis. This is a general introductory statistics course and is intended for a broad range of programs. NOTE: This course may not be taken for credit if credit is to be earned in 1016-314. (1016-204) **Class 4, Credit 4 (F, W, S, SU)**
- 1016-320** **Data Analysis II**  
This course is an elementary introduction to the topics of regression and analysis of variance. The statistical software package Minitab is used to reinforce these techniques. The focus of this course is on business applications. This is a general introductory statistics course and is intended for a broad range of programs. (1016-319 or equivalent) **Class 6, Credit 6 (F, W, S, SU)**
- 1016-328** **Engineering Mathematics**  
This course is an introduction to matrix algebra and vector calculus. Topics include matrix operations with applications to the solution of linear systems of algebraic equations; gradient, divergence and curl; line and surface integrals; independence of path and the divergence theorem; and Stokes’s theorem with discussion of engineering applications and analysis. NOTE: Credit may not be earned in both 1016-328 and 1016-410. (1016-305, 306) **Class 4, Credit 4 (F, S, SU)**

- 1016-331** **Matrix Algebra**  
This course is an introduction to the basic concepts of linear algebra, with an emphasis on matrix manipulation. Topics include Gaussian elimination, matrix arithmetic, determinants, Cramer's rule, vector spaces, linear independence, basis, null space, row and column spaces of a matrix, eigenvalues and eigenvectors. Various applications are studied throughout the course. (1016-305 or 1016 366) **Class 4, Credit 4 (F, W, S)**
- 1016-351** **Probability**  
This course covers descriptive statistics; sample spaces and events; axioms of probability; counting techniques; conditional probability and independence; distributions of discrete and continuous random variables; joint distributions; and central limit theorem. (1016-274 or 1016-283, or equivalent) **Class 4, Credit 4 (F, W, S)**
- 1016-352** **Applied Statistics I**  
This course covers basic statistical concepts, sampling theory, hypothesis testing, confidence intervals, point estimation and simple linear regression. A statistical software package is used for data analysis and statistical applications. (1016-351) **Class 4, Credit 4 (F, W, S)**
- 1016-353** **Applied Statistics II**  
This course is an introduction to simple linear regression, analysis of variance and the use of the statistical software package SAS. (1016-314 or 1016-352) **Class 4, Credit 4 (S)**
- 1016-354** **Introduction to Regression Analysis**  
This course is a study of regression techniques with applications to the type of problems encountered in real-world situations. It includes use of statistical software. Topics include review of simple linear regression, residual analysis, multiple regression, matrix approach to regression, model selection procedures and various other models as time permits. (1016-353 and 331 or equivalent) **Class 4, Credit 4 (W)**
- 1016-355** **Design of Experiments**  
This course is a study of the design and analysis of experiments and includes extensive use of statistical software. Topics include single-factor analysis of variance; multiple comparisons and model validation; multifactor factorial designs; fixed, random and mixed models; expected mean square calculations; confounding; randomized block designs; and other designs and topics as time permits. (1016-314 or 1016-352) **Class 4, Credit 4 (F)**
- 1016-358** **Statistical Quality Control**  
This course is a review of probability models associated with control charts; control charts for continuous and discrete data; interpretation of control charts; and some standard sampling plans. A statistical software package is used for data analysis. (1016-314 or 1016-352) **Class 4, Credit 4 (S)**
- 1016-365** **Combinatorial Mathematics**  
This is an introduction to the mathematical theory of combination, arrangement and enumeration of discrete structures. Topics include enumeration, recursion, inclusion-exclusion, block design and generating functions. (1016-265 or permission of instructor) **Class 4, Credit 4 (W)**
- 1016-366** **Discrete Mathematics II**  
This course is a continuation of 1016-265 Discrete Mathematics I with applications in computer science. Topics include relations, their closures, equivalence relations, partial orderings, recursively defined sets, countable and uncountable sets and an introduction to graph theory. (1016-265) **Class 4, Credit 4 (F, W, S)**
- 1016-370** **Introduction to Undergraduate Research**  
This is an introduction to the skills necessary for independent research on a mathematical or statistical problem with a focus on a specific research problem or problems. Literature search techniques, writing and presentations are included in the course. The students work on a research topic. (1016-331 or permission of instructor) **Class 4, Credit 4 (S)**
- 1016-379** **Data Analysis I Laboratory**  
This is a computer laboratory course that reinforces the concepts of 1016-319 Data Analysis I. The statistical software package Minitab is used. The focus is on statistical analysis of data with business applications. NOTE: This course may not be taken for credit if credit is to be earned in 1016-320. (Corequisite 1016-319 or equivalent) **Class 2, Credit 2 (F, W, S)**
- 1016-385** **History of Mathematics**  
This is an introduction to the history of mathematics that provides the opportunity to study the historical background of some topics in the mathematical sciences and to write about those topics. The set of topics studied will vary. (1016-306 or equivalent) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-399** **Mathematics Co-op Seminar**  
This course provides an exploration of cooperative education opportunities and practice in writing letters of application, and résumés and interviewing procedures. **Class 1, Credit 0 (W)**
- 1016-407** **Dynamical Systems**  
The course revisits the equations of spring-mass, RLC circuits and pendulum systems in order to view and interpret the phase space representations of these dynamical systems. This begins with linear systems followed by a study of the stability analysis of nonlinear systems. Matrix techniques are introduced to study higher order systems. The Lorentz equation will be studied to introduce the presence of chaotic solutions. A computer algebra system will be used. (1016-306) **Class 4, Credit 4 (S)**
- 1016-410** **Vector Calculus**  
This course is a continuation of multivariable calculus. Stokes's and Green's theorems and the divergence theorem are covered along with an introduction to the applications of these theorems in physics. NOTE: Credit may not be earned in both 1016-328 and 1016-410. (1016-305) **Class 4, Credit 4 (S)**
- 1016-411** **Real Variables I**  
This course is an investigation and extension of the theoretical aspects of elementary calculus. Topics include mathematical induction, real numbers, functions, limits, continuity, differentiation, L'Hopital's rule and Taylor's theorem. (1016-305 and 265 or permission of instructor) **Class 4, Credit 4 (F, W)**
- 1016-412** **Real Variables II**  
This is a continuation of 1016-411 that concentrates on integration: definition of integral—its existence and its properties—improper integrals, infinite series, sequences and power series. (1016-411) **Class 4, Credit 4 (W, S)**
- 1016-415** **Statistical Analysis for Bioinformatics**  
This course is an introduction to the probabilistic models and statistical techniques used in computational molecular biology. Probabilistic and/or statistical techniques will be presented for the understanding of pairwise and multiple-sequence alignment methods, gene and protein classification methods, and phylogenetic tree construction. (1016-273 or 1016-282, 1016-265 and 1016-319) **Class 4, Credit 4 (W)**
- 1016-420** **Complex Variables**  
This course features a brief discussion of preliminaries leading to the concept of analyticity, complex integration, Cauchy's integral theorem and integral formulas, Taylor and Laurent series, residues, and real integrals by complex methods. (1016-283 or 274 and also 1016-305) **Class 4, Credit 4 (F, W, SU)**
- 1016-432** **Linear Algebra**  
This course provides further development of the basic concepts of linear algebra, including orthogonality. Topics include similarity, linear transformations, diagonalization, inner products, Gram Schmidt, quadratic forms and various numerical techniques. Several applications of these ideas are also presented. (1016-331) **Class 4, Credit 4 (F, W, S)**
- 1016-437** **Computer Methods in Applied Mathematics**  
This course emphasizes the formulation of problems to allow solutions by standardized techniques and library routines. It is a study of numerical techniques such as direct and iterative methods for solving linear and nonlinear equations and optimizing functions; discrete methods for boundary value problems; and other techniques for solving problems. Homework is computer-based. (1016-305, 306, 331 and some programming knowledge) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-451** **Mathematical Statistics I**  
This course provides a brief review of basic probability concepts and distribution theory; mathematical properties of distributions needed for statistical inference. (1016-352 or 1016-314) **Class 4, Credit 4 (W)**
- 1016-452** **Mathematical Statistics II**  
This is a continuation of 1016-451 covering classical and Bayesian methods in estimation theory; chi-square test; Neyman-Pearson lemma; mathematical justification of standard test procedures; sufficient statistics and further topics in statistical inference. (1016-451) **Class 4, Credit 4 (S)**

- 1016-454** **Non-parametric Statistics**  
This is an in-depth study of inferential procedures that are valid under a wide range of shapes for the population distribution. Topics include tests based on the binomial distribution, contingency tables, statistical inferences based on ranks, runs tests and randomization methods. A statistical software package is used for data analysis. (1016-314 or 1016-352) **Class 4, Credit 4 (F)**
- 1016-457** **Research Sampling Techniques**  
This course provides a basis for understanding the selection of the appropriate tools and techniques for analyzing survey data. Topics include design of sample surveys, methods of data collection, study of standard sampling methods. A statistical software package is used for data analysis. (1016-352 or 1016-314) **Class 4, Credit 4 (W) (offered alternate years)**
- 1016-461** **Mathematical Modeling**  
This course explores problem solving, formulation of the mathematical model from physical considerations, solution of the mathematical problem, testing the model and interpretation of results. Problems are selected from the physical sciences, engineering and economics. (1016-305, 306, 331, 352) **Class 4, Credit 4 (F)**
- 1016-465** **Linear Optimization**  
This course is a presentation of the general linear programming problem. A review of pertinent matrix theory, convex sets and systems of linear inequalities; the simplex method of solution; artificial bases; duality; parametric programming, and applications are covered. (1016-331) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-466** **Advanced Optimization**  
This course provides a study of the theory of optimization of linear and non-linear functions of several variables with or without constraints. Applications of this theory to solve problems in business, management, engineering and the sciences are considered. Algorithms for practical applications will be analyzed and implemented. Students taking this course will be expected to complete applied projects and/or case studies. (1016-465 or equivalent) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-467** **Graph Theory**  
The basic theory of graphs and networks, including the concepts of circuits, trees, edge and vertex separability, planarity and vertex coloring, and partitioning are discussed. There is a strong emphasis on applications to physical problems and on graph algorithms such as those for spanning trees, shortest paths, non-separable blocks and network flows. (1016-265) **Class 4, Credit 4 (F, S)**
- 1016-469** **Mathematical Simulation**  
This is an introduction to computer simulation, simulation languages, model building and computer implementation, and mathematical analyses of simulation models and their results using techniques from probability and statistics. (1016-352; 4003-231, 232 or permission of instructor) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-470** **Undergraduate Research**  
The students work on a research topic under the supervision of a faculty member. A form describing the research goals must be signed by the faculty member and the head of the school before registration. (Permission of instructor) **Credit 2 to 4 (F, W, S, SU)**
- 1016-481** **Topics in Mathematical Problem Solving**  
This course helps students develop strategies for solving problems that are chosen from a wide variety of areas in mathematics. Emphasis is on attempting problem solutions and presentation of efforts to the class or to the instructor. (One year of calculus or permission of instructor) **Class 2, Credit 2 (F)**
- 1016-485** **Number Theory**  
This course is a study of the structure of the set of integers. Topics such as divisibility, congruences, arithmetic functions, primitive roots, quadratic residues and the nature and distribution of primes are investigated. (1016-265) **Class 4, Credit 4 (W)**
- 1016-501** **Advanced Differential Equations**  
A study of first order, linear higher order and systems of differential equations, including such topics as existence, uniqueness, properties of solutions, Green's functions, Sturm Liouville systems and boundary value problems is provided. (1016-305, 306; 1016-331 desirable) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-502** **Advanced Differential Equations II**  
A study of first order, linear higher order and systems of differential equations including such topics as existence, uniqueness, properties of solutions, Green's functions, Sturm Liouville systems and boundary value problems. (1016-501) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-511** **Numerical Analysis**  
Numerical techniques for the solution of nonlinear equations, interpolation, differentiation, integration and initial value problems are discussed. (1016-305 and 306, some programming knowledge) **Class 4, Credit 4 (S)**
- 1016-512** **Numerical Linear Algebra**  
Numerical techniques that treat systems of linear equations, eigenvalue problems, boundary value problems, splines, and additional topics at the discretion of the instructor are discussed. (1016-305, 306, 432 and some programming knowledge) **Class 4, Credit 4 (F)**
- 1016-521** **Topics in Probability and Statistics**  
Selected topics in applied probability and statistics to meet the need and interest of the students are presented. (1016-305, 352 or permission of instructor) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-524** **Introduction to Time Series**  
A study of the modeling and forecasting of time series is provided. Topics include ARMA and ARIMA models, autocorrelation function, partial autocorrelation function, detrending, residual analysis, graphical methods and diagnostics. A statistical software package is used for data analysis. (1016-352 or 1016-314) **Class 4, Credit 4 (S) (offered upon sufficient request)**
- 1016-525** **Stochastic Processes**  
This course explores Poisson processes and Markov chains with an emphasis on applications. Extensive use is made of conditional probability and conditional expectation. Further topics, such as renewal processes, Brownian motion, queuing models and reliability, are discussed as time allows. (1016-331, 351, or permission of instructor) **Class 4, Credit 4 (W)**
- 1016-531** **Abstract Algebra I**  
This course is a review of pertinent basic set theory and number theory, groups, subgroups, cyclic and permutation groups, Lagrange's theorem, quotient groups, isomorphism theorems, and applications to scientific problems. (1016-265, 432) **Class 4, Credit 4 (W, S)**
- 1016-532** **Abstract Algebra II**  
The basic theory of rings, integral domains, ideals and fields  $GF(p^n)$ , applications to coding theory or abstract vector spaces, function spaces, direct sums, applications to differential equations and to scientific problems are discussed. (1016-531) **Class 4, Credit 4 (F, S)**
- 1016-542** **Actuarial Mathematics**  
Students study challenging problems in probability and statistics whose solutions require a combination of skills that one acquires in a typical mathematical statistics curriculum. Course work synthesizes basic essential problem-solving ideas and techniques as they apply to actuarial mathematics. (1016-451 or permission of instructor) **Class 2, Credit 2 (offered upon sufficient request)**
- 1016-551** **Topics in Algebra**  
Topics in abstract algebra to be chosen by the instructor either to give the student an introduction to topics not taught in 1016-531, 532 or to explore further the theory of groups, rings or fields. (1016-532) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-552** **Topics in Analysis**  
Topics in analysis to be chosen by the instructor, either to introduce the student to topics not covered in 1016-411, 412 or to explore further the topics covered there. (1016-265, 412) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-555** **Statistics Seminar**  
The seminar introduces the student to statistical situations not encountered in the previous course of study. Topics include open-ended analysis of data, motivating use of statistical tools beyond the scope of previous courses, introduction to the statistical literature, development of statistical communication skills and the pros and cons of statistical software packages. (1016-354, 355) **Class 4, Credit 4 (S)**

- 1016-558** **Multivariate Analysis**  
A study of the multivariate normal distribution, statistical inference on multivariate data, multivariate analysis of covariance, canonical correlation, principal component analysis and cluster analysis. A statistical software package is used for data analysis. (1016-354, 1016-331) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-559** **Special Topics**  
Topics of special interest to a sufficiently large group of students, and not covered in other courses, may be offered upon request. (Permission of instructor) **Class variable, Credit variable (offered upon sufficient request)**
- 1016-561** **Complex Analysis I**  
This course is an introduction to the theory of functions of one complex variable. Limits, continuity, differentiability; analytic functions; complex integration; Cauchy integral theorem and formula; sequences and series; Taylor and Laurent series; singularities; residues; analytic continuation; and conformal mapping are discussed. This is a more in-depth study of analytic function theory than 1016-420. (1016-411) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-562** **Complex Analysis II**  
This course provides an introduction to the notion of Cauchy integration theory, analytic function by power series and the calculus of residues. (1016-561) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-565** **Game Theory**  
This is an introduction to the theory of games with solution techniques and applications. Topics include game trees, matrix games, linear inequalities and programming, convex sets, the minimax theorem, n-person games. (1016-331 or permission of instructor) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-566** **Nonlinear Optimization Theory**  
The theory of optimization of nonlinear functions of several real variables is presented. Topics include unconstrained optimization (Newton-Raphson, steepest ascent and gradient methods), constrained optimization (Lagrange multipliers, Kuhn-Tucker theorem, penalty concept, dynamic programming) and computational aspects (rates of convergence, computational complexity). (1016-305, 432) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-571** **Topology I**  
Metric spaces, topological spaces, separation axioms, compactness, connectedness and product spaces are discussed. (1016-412 or permission of instructor) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-572** **Topology II**  
A continuation of topics from 1016-571. (1016-571 or permission of instructor) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-581** **Introduction to Linear Models**  
This course is an introduction to the theory of linear models. Least squares estimators and their properties; matrix formulation of linear regression theory; random vectors and random matrices; the normal distribution model and the Gauss-Markov theorem; variability and sums of squares; distribution theory; the general linear hypothesis test; confidence intervals; confidence regions; correlations among regressor variables; ANOVA models; geometric aspects of linear regression; and less than full rank models are introduced. (1016-331, 354) **Class 4, Credit 4 (offered upon sufficient request)**
- 1016-599** **Mathematics: Independent Study**  
Faculty-directed study of appropriate topics on a tutorial basis. Used to enable an individual to pursue studies of existing knowledge available in the literature and not taught in regularly offered courses. **Class variable, Credit variable**
- 1055-265** **Honors Discrete Mathematics**  
This is an Honors course in discrete mathematics designed to challenge Honors students and others capable of excellence in mathematics with demanding problems and proofs in introductory number theory, set theory, logic and combinatorics. (Honors student status or permission of instructor) **Class 4, Credit 4 (F)**
- 1055-319** **Honors Research Statistics**  
This is a project-based introductory statistics course for RIT Honors students. Students will learn to formulate research problems in statistical terms, summarize data, draw inferences about populations and then state results in the context of an application. The statistical software package Minitab and a graphing calculator will be used. This course may be taken in place of 1016-319 or 1016-314. (1016-204 or equivalent, Honors student status or permission of instructor) **Class 4, Credit 4 (W)**
- 1055-351** **Honors Probability**  
Topics discussed in this course include descriptive statistics, sample spaces and events, axioms and probability, counting techniques, conditional probability and independence, distributions of discrete and continuous random variables, joint distributions and central limit theorem. (1016-274, 1016-283 or equivalent and Honors student status, or permission of instructor) **Class 4, Credit 4 (S)**
- 1055-361** **Honors Codes and Ciphers**  
This course will introduce, explain and employ the basic techniques of cryptography, both classical and modern. Topics will include shift, Vignere, affine, Hill ciphers, one-time pad, Enigma and modern day cryptosystems: data encryption standard (DES) and advanced encryption standard (AES), public key encryption schemes-RSA, and hash functions. The course will also include a brief introduction to number theoretic tools used in cryptography. (Honors standing or permission of instructor) **Class 4, Credit 4 (upon sufficient demand)**
- 1055-366** **Honors Discrete Mathematics II**  
This course is a continuation of 1055-265 Honors Discrete Mathematics I. Topics include relations, their closures, equivalence relations, partial orderings, recursively defined sets, countable and uncountable sets, algebra and an introduction to graph theory. (1055-265 and Honors student status and corequisite 1016-283, or permission of instructor) **Class 4, Credit 4 (W)**
- Physics**
- 1017-200** **Introduction to Special Relativity**  
Students will learn aspects of Einstein's Theory of Special Relativity, including time dilation, length contraction, Lorentz transformations, velocity transformations, relativistic Doppler effect, issues with simultaneity, and relativistic expressions for energy and momentum. (High school physics and algebra) **Class 3, Credit 2 (F)**
- 1017-202** **Exploration in Physics**  
This is an activity-based course in which topics will encompass a range of physical phenomena. Scientific concepts are introduced to provide a basis for understanding phenomena such as sight and optics, motion, rainbows, cloud formation and global warming. Typically two topics per quarter will be covered. The main emphasis will be on the process of scientific investigation, with students developing hands-on projects each quarter. **Class 4, Lab 2, Credit 4 (S)**
- 1017-211** **College Physics I**  
This is an introductory course in algebra-based physics focusing on mechanics. The course is taught in a lecture/workshop format that integrates material traditionally found in separate lecture and laboratory courses. Topics include kinematics, planar motion, Newton's Laws, gravitation; rotational kinematics and dynamics; work, kinetic and potential energy; momentum and impulse; conservation laws; data presentation and analysis, and error propagation. (Competency in algebra, geometry and trigonometry) **Class 6, Credit 4 (F, W, S, Su)**
- 1017-212** **College Physics II**  
This is an introductory course in algebra-based physics focusing on basic topics in oscillatory motion, wave motion, sound, geometrical optics, physical optics, fluids, heat and thermodynamics. The course is taught in a lecture/workshop format that integrates material traditionally found in separate lecture and laboratory courses. (1017-211 College Physics I) **Class 6, Credit 4 (F, W, S, Su)**
- 1017-213** **College Physics III**  
This is an introductory course in algebra-based physics focusing on the topics of electrostatics, DC and AC electrical circuits, magnetic forces and fields, electromagnetic induction, Bohr model of the atom and radioactivity. The course is taught in a lecture/workshop format that integrates material traditionally found in separate lecture and laboratory courses. (1017-211 College Physics I; 1017 212 College Physics II recommended) **Class 6, Credit 4 (F, W, S)**
- 1017-230** **Stellar Astronomy**  
An introduction to the basic concepts of stellar astronomy, including celestial sphere, constellations, nomenclature, physical properties of the stars, principles of spectroscopy as applied to astronomy, double stars, variable stars, star clusters, stellar evolution, gaseous nebulae, stellar motions and distribution, and the Milky Way system is provided. This course is not recommended for students required to take University Physics. (Competency in algebra) (May be taken before or after 1017-235, 240) **Class 3, Credit 3 (F)**

- 1017-231 Stellar Astronomy Laboratory**  
This laboratory course includes experiments related to the principles and theories discussed in the corresponding lecture. Observational exercises utilizing the RIT observatory and associated equipment are emphasized. (Credit or co-registration in 1017-230) **Class 2, Credit 1 (F)**
- 1017-235 Solar System Astronomy**  
This course is an introduction to basic concepts of solar system astronomy, including celestial sphere, zodiac, astronomical telescopes, sun, moon, eclipses, Earth as a planet, planets and their satellites, comets, meteors and theories of the origin of the solar system. This course is not recommended for students required to take University Physics. (Competency in algebra) (May be taken before or after 1017-230, 240) **Class 3, Credit 3 (S)**
- 1017-236 Solar System Astronomy Laboratory**  
This laboratory course includes experiments related to the principles and theories discussed in the corresponding lecture. Observational exercises utilizing the RIT observatory and associated equipment are emphasized. (Credit or co-registration in 1017-235) **Class 2, Credit 1 (S)**
- 1017-240 Extragalactic Astronomy**  
An introduction to extragalactic astronomy, including the history of our discovery of the external galaxies and their classification, the "cosmic distance ladder," quasars and other distinct objects, the Big Bang theory of cosmology and the future of the universe. This course is not recommended for students required to take University Physics. (Competency in algebra) (May be taken before or after 1017-230, 235) **Class 3, Credit 3 (W)**
- 1017-289 Contemporary Science: Physics**  
This is an introductory science for non-science students. One or more topics such as astronomy, space exploration, relativity, nuclear energy and lasers are discussed and simply explained to give an appreciation of the significance of physics in our contemporary technological society. A minimum of mathematics is used. A laboratory or discussion option may be offered for small group meetings once a week, which reinforces the material given in demonstration lectures and audiovisual presentations. NOTE: Not acceptable for science credit for College of Science majors. (Competency in algebra) **Class 4, Credit 4 (F, W, S)**
- 1017-300 Introduction to Semiconductor Device Physics**  
An introductory survey, using some calculus, of the physics underlying the operation and manufacture of modern semiconductor devices used in integrated circuits and microcomputers. Review of classical physics, classical free-electron gas, atomic physics, molecular bonds and band theory, theory of metals, structure and properties of semiconductors and semiconductor devices will be provided. (1017-213; 1016-304) **Class 4, Credit 4 (offered upon sufficient request) (S)**
- 1017-301 University Astronomy**  
This course is an introduction to the basic concepts of astronomy and astrophysics for scientists and engineers. Topics include the celestial sphere, celestial mechanics, methods of data acquisition, planetary systems, stars and stellar systems, cosmology and life in the universe. (1017-311; 1016-281) **Class 4, Credit 4 (F, S)**
- 1017-311 University Physics I**  
This is an intensive course in calculus-based physics for science and engineering majors. The course is taught in a lecture/workshop format that integrates the material traditionally found in separate lecture and laboratory courses. Topics include kinematics, planar motion, Newton's Laws, gravitation; work, kinetic and potential energy; momentum and impulse; conservation laws; systems of particles; data presentation and analysis; and error propagation. (1016-271 or 1016-281; credit or co-registration in 1016-272 or 1016-282) **Class 6, Credit 4 (F, W, S)**
- 1017-312 University Physics II**  
This course is a continuation of University Physics I (1017-311). The course is taught in a lecture/workshop format that integrates the material traditionally found in separate lecture and laboratory courses. Topics include rotational kinematics and dynamics, rigid body motion, angular momentum, static equilibrium, oscillatory motion, wave motion, sound and physical optics. (1017-311, 1016-271 or 1016-281; credit or co-registration in 1016-272 or 1016-282) **Class 6, Credit 4 (F, W, S, SU)**
- 1017-313 University Physics III**  
This course is a continuation of University Physics II (1017-312). The course is taught in a lecture/workshop format that integrates the material traditionally found in separate lecture and laboratory courses. Topics include electrostatics, Gauss's law, electric field and potential, capacitance, resistance, DC circuits, magnetic field, Ampere's law, and inductance. (1017-312, 1016-273 or 1016-282) **Class 6, Credit 4 (F, W, S)**
- 1017-314 Modern Physics I**  
An introductory survey of elementary quantum physics at the sophomore level, including relativistic dynamics, quantization, photons, wave-particle duality, deBroglie waves, Bohr model, introduction to wave mechanics, the Schrödinger equation, energy levels, degeneracy, hydrogen atom, spin, multi-electron atoms. (1016-305; 1017-312, 313) **Class 4, Credit 4 (F, W, S)**
- 1017-315 Modern Physics II**  
A continuation of a survey of modern physics at the sophomore level. This course introduces the fundamentals of multi-electron atoms, statistical treatment of systems of particles, elementary solid state physics, applications to semiconductors and nuclear and particle physics. (1016-314) **Class 4, Credit 4 (S)**
- 1017-316 Particle Physics, Stars and the Big Bang**  
This is a second course in modern physics designed for students who have completed the introductory modern physics course. Topics include an introduction to the structure of nuclei, nuclear reactions, and elementary particle physics; the creation of the elements through the lives of stars, hydrogen fusion, black holes and supernovae; and the origin and fate of the universe from the Big Bang to the unknown future. (1017-314 or permission of instructor) **Class 4, Credit 4 (offered upon sufficient request) (S)**
- 1017-317 Introduction to Computational Physics and Programming**  
An introduction to techniques of computational physics, such as numerical differentiation, integration, solutions of the equations of Newtonian mechanics, and coupled differential equations. The course includes a very brief introduction to computer programming, focusing on documentation, style and clarity, as well as introducing functional programming language. (Credit or co-registration in 1017-312 and 1016-282) **Class 4, Credit 4 (S)**
- 1017-318 Vibrations and Waves**  
An introduction to the physics of vibrations and waves. (1017-312, 1016-282 or 1016-273; corequisites: credit or co-registration in 1017-313, credit or co-registration in 1016-283 or 1016-274) **Class 4, Credit 4 (F)**
- 1017-320 Principles of Optics**  
An introductory course in physical and geometrical optics. Wave and photon description of light; propagation of electromagnetic waves in vacuum and transparent media; mirrors, lenses and simple optical instruments; basics of optical fibers; polarization of light and polarizing optical elements; interference; Michelson interferometer; Fraunhofer and Fresnel diffraction; diffraction gratings. (1017-213, 1016-206) **Class 4, Credit 4 (W)**
- 1017-321 Introduction to Laboratory Techniques**  
An introduction to common techniques used in the physics laboratory, including data acquisition using LabVIEW, thermometry, optical systems, vacuum systems and methods of dealing with small signals and noise. (1017-313, 1017-317, 1017-431) **Class 3, Lab 3, Credit 4 (S)**
- 1017-331 Introduction to Electricity and Electronics**  
Fundamentals of electricity; construction and measurements of electrical and electronic circuits encountered in a scientific laboratory. (1017-211, 212) **Class 3, Lab 3, Credit 4 (offered upon sufficient request) (S)**
- 1017-341 Foundations of Scientific Thinking**  
Definition of science; historical perspective; ingredients of the scientific quest; the scientific method; scientific explanation, laws, theories and hypotheses; the role of mathematics; probability and induction; science and other disciplines. (At least a year of basic sciences at the college level) **Class 2, Credit 2 (offered upon sufficient request) (F, W)**
- 1017-350 Sophomore Physics Seminar**  
A study of concepts that unify the diverse topics covered in the introductory physics sequence. Preparation for Comprehensive Oral Exam I. Techniques of physics literature searches and the preparation and organization of technical papers and oral presentations. Physics majors must pass this course before going on to 400-level courses. (1017-311, 312, 313, 314) **Class 2, Credit 1 (S)**

- 1017-359** **Special Topics: Physics**  
Intermediate courses which are of current interest and/or logical continuations of the courses already being offered. These courses are structured as ordinary courses and have specific prerequisites, contact hours and examination procedures. Topics could include introductory statistical mechanics, plasma physics, general relativity, linear integrated circuits, cryogenics, radio astronomy, history of physics, astrophysics and astronomy. The level of study is appropriate for students in their first three years of study. **Class variable, Credit variable (offered upon sufficient request)**
- 1017-374** **Experiments in Modern Physics I**  
This course consists of experiments representative of the experimental foundations of modern quantum physics, including experiments investigating wave particle duality, measurement of fundamental constants, and the earliest of quantum mechanical models. Experiments include electron diffraction, the photoelectric effect, optical diffraction and interference, atomic spectroscopy, charge to mass ratio of an electron and black-body radiation. (1017-313, 314) **Class 1, Lab 3, Credit 2 (S)**
- 1017-378** **Experiments in Modern Physics II**  
This course consists of more experiments investigating the foundations of modern quantum physics and their applications. These experiments span topics in atomic and nuclear physics, semiconductor physics, and phase transitions and critical phenomena. Experiments include the Franck-Hertz experiment, Ramsauer-Townsend effect, optical pumping in rubidium atoms, nuclear spectroscopy, radioactive half-life, the Hall effect in semiconductors and metals, properties of light-emitting diodes, transistors, ferromagnetic and superconducting phase transitions. (1017-313, 314) **Lab 4, Credit 2 (F)**
- 1017-395** **Physics Research**  
Faculty-directed student project or research involving laboratory work or theoretical calculations that could be considered of an original nature. The level of study is appropriate for students in their first three years of study. (Permission of instructor) **Class variable, Credit variable (offered every year)**
- 1017-399** **Physics: Intermediate Independent Study**  
Faculty-directed study of appropriate topics on a tutorial basis. The level of study is appropriate for students in their first three years of study. **Class variable, Credit variable**
- 1017-401** **Intermediate Mechanics I**  
Particle dynamics in one, two and three dimensions; systems of particles; conservation laws; rigid body motion; gravitational fields and potentials. (Credit or co-registration in 1017-480) (1016-306, 1017-312, 313) **Class 4, Credit 4 (F)**
- 1017-402** **Intermediate Mechanics II**  
Translating and rotating coordinate systems, mechanics of continuous media, wave motion, Lagrangian formulation of mechanics. (1017-401, 480) **Class 4, Credit 4 (W)**
- 1017-411** **Electricity and Magnetism I**  
Electric and magnetic fields using vector methods, Gauss's law, theory of dielectrics, Ampere's law and Faraday's law, vector potential, displacement current, Maxwell's equations, wave propagation in dielectrics and conductors, and production and propagation of radiation. (1016-306; 1017-312, 313, 480) **Class 4, Credit 4 (F)**
- 1017-412** **Electricity and Magnetism II**  
Electric and magnetic fields using vector methods, Gauss's law, theory of dielectrics, Ampere's law and Faraday's law, vector potential, displacement current, Maxwell's equations, wave propagation in dielectrics and conductors, and production and propagation of radiation. (1016-306; 1017-312, 313, 411, 480) **Class 4, Credit 4 (W)**
- 1017-415** **Thermal Physics**  
Introduction to the principles of classical thermodynamics and kinetic theory. Equations of state, the first and second laws of thermodynamics, entropy, thermodynamic potentials, applications of thermodynamics, and kinetic theory of gases. (1016-305; 1017-312, 313) **Class 4, Credit 4 (F)**
- 1017-421** **Experimental Physics I**  
The elements of advanced laboratory work, including the importance of detailed experiment planning, are presented. The requirement of effective communication of results is also an integral part of the course. Experiments are chosen from any area of physics compatible with department facilities: optics, thin films, cryogenics, semiconductors, acoustics, nuclear, etc. (1017-314, 321, 374, 431 plus co-registration or credit in any one of these: 1017-401, 411, 415, 455) **Class 1, Lab 5, Credit 3 (W)**
- 1017-422** **Experimental Physics II**  
The elements of advanced laboratory work, including the importance of detailed experiment planning, are presented. The requirement of effective communication of results is also an integral part of the course. Experiments are chosen from any area of physics compatible with department facilities: optics, thin films, cryogenics, semiconductors, acoustics, nuclear, etc. (1017-314, 321, 431 plus co registration or credit in any one of these: 1017-401, 411, 415, 455) **Class 1, Lab 5, Credit 3 (S)**
- 1017-431** **Electronic Measurements**  
An introduction to electronic measurement and instrumentation for analog and digital circuits. Building and testing circuits using discrete components and integrated circuits. (1017-313 or 1017-213, college-level calculus) **Class 3, Lab 3, Credit 4 (F)**
- 1017-432** **Computer Interfacing to Laboratory Equipment**  
An introduction to microcomputer interfacing with associated laboratory exercises. Emphasis on the interface circuits using an 80286-based microprocessor. Covers elementary logic circuits, computer architecture, assembly language programming, serial and parallel interfaces, A/D and D/A conversion, RS-232C, IEEE488 and other industry standards. (1017-331 or 431 or equivalent) **Class 3, Lab 3, Credit 4 (offered upon sufficient request) (F)**
- 1017-435** **Introduction to Chaotic Dynamics of Physics**  
Basic concepts for visualizing the behavior of nonlinear physical systems. Use of the computer as an exploratory tool for generating and observing transitions between periodic and chaotic behavior. The driven, damped pendulum as a model dynamical system for exploring such concepts as sensitivity to initial conditions, routes to chaos, strange attractors and fractal basin boundaries. Students are asked to extend general ideas to a specific physical system by performing a term project. (1017-317, 401) **Class 4, Credit 4 (offered upon sufficient request) (F or W)**
- 1017-440** **Stellar Astrophysics**  
A survey of basic concepts of the astrophysics of stars and stellar systems. Observed characteristics of stars, stellar atmospheres, stellar structure, stellar evolution, interstellar medium and the Milky Way. (1017-301 or permission of instructor, 1017-314) **Class 4, Credit 4 (offered upon sufficient request) (W)**
- 1017-442** **Galactic Astrophysics**  
This course is a survey of the astrophysics of galaxies and other stellar systems. Emphasis is on the structure and dynamics of the Milky Way galaxy. (1017-301 or permission of instructor, 1017-314) **Class 4, Credit 4 (offered upon sufficient request) (W)**
- 1017-443** **Extragalactic Astrophysics and Cosmology**  
This course is a survey of our current understanding of the structure, origin and evolution of the universe. (1017-301 or permission of instructor, 1017-314) **Class 4, Credit 4 (offered upon sufficient request) (S)**
- 1017-445** **Observational Astronomy**  
This course provides a practical, hands-on introduction to optical astronomy. Students will use the RIT Observatory telescopes and CCD cameras to take images of celestial objects, reduce the data, and analyze the results. The course will emphasize the details of image processing required to remove instrumental effects from CCD images. (1017-301 or permission of instructor) **Class 4, Credit 4 (offered upon sufficient request) (S)**
- 1017-455** **Physical Optics**  
Physical optics, including interference, diffraction, and polarization. Brief introduction to modern optics. (1016-305; 1017-312, 313, 480) **Class 4, Credit 4 (S)**
- 1017-480** **Mathematical Methods in Physics I**  
This course serves as an introduction to the tools needed to solve intermediate and upper-level physics problems. Topics to be covered include matrix algebra, vector calculus, Fourier analysis and partial differential equations in rectangular coordinates. (1016-306, 1017-312, 313) **Class 4, Credit 4 (F)**
- 1017-481** **Mathematical Methods in Physics II**  
This course is a continuation of 1017-480. In the context of intermediate-level physics problems, this course serves as an introduction to the tools needed to solve those encountered in upper-level physics courses. Topics typically covered include series solutions to ordinary differential equations, solving partial differential equations in various coordinate systems, phase-space treatment of differential equations (stability, non-linear systems), matrix eigenvalue problems, and the calculus of variations. (1017-480) **Class 4, Credit 4, (W)**

**1017-502** **Capstone Project I**  
In collaboration with faculty mentor(s), students will carry out the first phase of an experimental, theoretical or computational physics research project, will prepare an interim paper, and will present a short talk on their progress to physics faculty and students. The projects are those planned during the capstone preparatory course taken during the prior spring quarter. (1017-400) **Lab 12, Credit 4 (F)**

**1017-503** **Capstone Project II**  
In collaboration with faculty mentor(s), students will carry out the second phase of an experimental, theoretical or computational physics research project and will prepare a written paper and present an oral report and a poster on their project to physics faculty and students. The projects are those planned during the capstone preparatory course taken during spring quarter, and commenced during the prior fall quarter. (1017-502) **Lab 9, Credit 3 (W)**

**1017-511** **Experimental Optics**  
Advanced laboratory course with experiments based on topics in Optical Physics I and II. Laboratory work includes experimental design, construction, data collection, analysis and reporting. (1017-455) **Lab 6, Credit 3 (offered upon sufficient request) (F or W)**

**1017-521** **Advanced Experimental Physics**  
Advanced laboratory experiments and projects in atomic physics, nuclear physics or solid state physics. Special emphasis on experimental research techniques. (1017-412, 421) **Lab 6, Credit 2 (F)**

**1017-522** **Quantum Mechanics I**  
A study of the concepts and mathematical structure of nonrelativistic quantum mechanics. Wave functions and the Schrodinger equation. Solutions to the one-dimensional and three-dimensional time-independent Schrodinger equation. Stationary states and their superposition to produce time-dependent states. Quantum-mechanical operators, commutators and uncertainty principles. Solutions to central potential problems, including the hydrogen atom. (1017-314, 402, 480) **Class 4, Credit 4 (F)**

**1017-523** **Quantum Mechanics II**  
Continued study of the concepts and mathematical structure of non-relativistic quantum mechanics presented in Quantum Mechanics I, with an emphasis on applications to real physical systems. Topics to be covered include orbital angular momentum, effect of magnetic field on spinning charged particles, systems of identical particles, many electron atoms and band-structure solids, and absorption and emission of radiation by atoms. (1017-522) **Class 4, Credit 4 (W)**

**1017-531** **Solid State Physics**  
The structure of solids and their thermal, mechanical, electrical and magnetic properties. (1017-315, 415, 480 and 522) **Class 4, Credit 4 (offered upon sufficient request)**

**1017-539** **Astrophysics Research**  
Faculty-directed student project or research involving observational or theoretical work that could be considered of an original nature. (1017-445 or permission of instructor) **Class variable, Credit variable (offered upon sufficient request)**

**1017-540** **Astronomical Instrumentation and Techniques**  
A survey of modern instrumentation and techniques used in astronomical data acquisition. Topics include astronomical sources, observational limits, telescopes, atmospheric effects, spectrographs, dilute apertures and detectors. (1017-455 or permission of instructor) **Class 3, Credit 3 (offered upon sufficient request)**

**1017-553** **Nuclear Physics**  
A study of the structure of the atomic nucleus as determined by experiments and theory. Description and quantum mechanical analysis of nuclear properties, radioactivity and nuclear reactions. (1017 522) **Class 4, Credit 4 (offered on sufficient request)**

**1017-555** **Optical Physics II**  
This course is an extension of Physical Optics I (1017-455). It covers coherence theory, Fourier optics, holography, gradient index optics and other modern optics topics. (1017-455) **Class 4, Credit 4 (offered upon sufficient request)**

**1017-556** **Laser Physics**  
The semiclassical theory of the operation of a laser, characteristics and practical aspects of laser systems, applications of lasers in scientific research. (1017-455) **Class 4, Credit 4 (offered upon sufficient request)**

**1017-559** **Special Topics**  
Advanced courses that are of current interest and/or logical continuations of the courses already being offered. These courses are structured as ordinary courses and have specific prerequisites, contact hours and examination procedures. Topics could include introductory statistical mechanics, plasma physics, general relativity, linear integrated circuits, cryogenics, radio astronomy, history of physics, astrophysics or astronomy. (The level of study is appropriate for students in their fourth or fifth years of study.) **Class variable, Credit variable (offered upon sufficient request)**

**1017-595** **Advanced Physics Research**  
Faculty-directed student project or research involving laboratory work or theoretical calculations that could be considered of an original nature. The level of study is appropriate for students in their fourth and fifth years of study. (Permission of instructor) **Class variable, Credit variable (offered upon sufficient request)**

**1017-599** **Physics: Advanced Independent Study**  
Faculty-directed study of appropriate topics on a tutorial basis. The level of study is appropriate for students in their fourth or fifth years of study. **Class variable, Credit variable**

**1017-602** **Statistical Physics**  
Introduction to the statistical description of systems of particles with mechanical, electrical and thermal interactions. Statistical calculation of thermodynamic quantities. Basic methods and results of statistical mechanics. Applications of statistical mechanics to elementary classical and quantum systems. (1017-314, 1017-415, 1017-480) **Class 4, Credit 4 (offered upon sufficient request)**

## General Science

**1018-210, 211** **General Science Exploration Seminar I**  
This course provides an introduction to the opportunities available within the College of Science and RIT. It offers the students the opportunity to increase their knowledge of science programs and careers, develop group skills and establish a sense of community within the group. **Class 2, Credit 1 (F, W)**

## Medical Sciences

**1026-205** **Introduction to Medical Diagnostic Imaging**  
This course provides an overview of four diagnostic medical imaging modalities: radiography, magnetic resonance imaging, nuclear medicine, and ultrasound. The history, current uses and different trends of each modality, as well as comparisons among the modalities, will be discussed. **Class 2, Credit 2 (F, S)**

**1026-220** **Medical Laboratory Procedures**  
This first part of a three-course sequence (see 1026-221, 222 following) is a survey of the most frequently performed laboratory tests used in the diagnosis and treatment of disease and maintenance of health. The fundamentals of medical laboratory procedures are reinforced by laboratory experiences in microscopy, urinalysis, clinical chemistry, hematology, serology and bacteriology. Laboratory safety and quality assurance are also stressed. This course may not be taken by medical sciences majors to fulfill degree requirements. **Class 3, Lab 2, Credit 4 (F)**

**1026-221** **Health Awareness**  
This continuation of 1026-220 (see above) provides the opportunity to explore the effects of common stressors on lifestyle. Basic structure and function of selected human body systems are discussed and related to factors such as diet, alcohol, drugs, smoking, stress and the environment. Lecture, discussion, demonstrations and student participation are used to explore health-related issues. **Class 4, Credit 4 (W)**

**1026-222** **Human Diseases**  
A general survey of human diseases from a systematic approach with emphasis on disease symptoms, etiology, diagnosis and prognosis. Also included are the topics of immunology, oncology, endocrinology, and pathophysiology. Upon completion of this course students will have a basic knowledge of many diseases that afflict mankind. **Class 3, Lab 2, Credit 4 (S)**

**1026-301** **Medical Terminology**  
This course emphasizes the etymology, definition, pronunciation and correct utilization of medical terms. Learning the skills to analyze and construct medical terms enables a student to develop a vocabulary essential to the understanding of the language used by medical professionals. **Class 3, Credit 3 (F, S)**

**1026-305 Sports Physiology and Life Fitness**  
A contemporary science course that provides a foundation for understanding the importance of nutrition and energy transfer in maximizing the potential for exercise and training. In addition to the basic principles of exercise physiology, a variety of contemporary issues are covered, including use of legal and illegal aids, cardiovascular fitness and disease prevention, training methodologies, and fitness assessment. Particularly appropriate for individuals interested in maintaining their level of physical fitness and wellness, participating in competitive athletics or working in recreation or physical therapy. (Distance learning offering) **Class 4, Credit 4 (F, W, Su)**

**1026-306 Fitness Prescription Programming**  
This course is designed to help students develop the skills and knowledge necessary to provide safe and appropriate fitness assessments and exercise programs. The American College of Sports Medicine objectives for health fitness instructor certification serve as the core learning objectives. Students will practice exercise testing and prescription skills at various points throughout the course. (1026-305) **Class 4, Credit 4 (W)**

**1026-307 Exercise Prescription**  
This course is designed for those who work in the field of exercise/fitness or medical health care who work with individuals and patients with diagnosed disease states or other significant limitations who would benefit from appropriately designed and prescribed exercise programs. The course will review theoretical and diagnostic value of testing, create exercise prescriptions, and provide understanding of the therapeutic benefit exercise will have on specific conditions. Some topics to be addressed include: rheumatoid arthritis, diabetes, high blood cholesterol, obesity, pulmonary disorders, coronary heart disease, cystic fibrosis, hypertension, low functional capacity and aging. (1026-306) **Class 4, Credit 4 (S)**

**1026-333 Patient Care**  
This course is designed for students in the medical sciences and biological sciences. The course will introduce and develop basic skills for providing integrated patient care through assessment, communication and continuous care. The course will also introduce students to the concept of medical ethics and infection control issues related to their future patients. **Credit 2 (S)**

**1026-350 Anatomy and Physiology I**  
An integrated approach to the structure and function of the nervous, endocrine, integumentary, muscular and skeletal systems. Laboratory exercises include histological examinations, anatomical dissections and physiological experiments using human subjects. (1001-253 or equivalent or permission of instructor for nonscience majors) **Class 4, Lab 3, Credit 5 (F)**

**1026-353 New Medical Technologies**  
A seminar series that provides students with exposure to the latest techniques and scientific discoveries modernizing the clinical laboratory. **Class 1, Credit 1 (S)**

**1026-355 Physiology and Anatomy for Engineers I**  
The first of a two-quarter sequence designed for engineering students enrolled in the biomedical and bioengineering options that offers an integrated approach with an emphasis on structures and functions of the musculoskeletal and nervous systems. Other details associated with the integumentary and endocrine systems are also included. Laboratory exercises include practical physiology experiments and projects to complement lecture material. This course does not meet premed requirements. **Class 6, Credit 4 (F)**

**1026-360 Anatomy and Physiology II**  
An integrated approach to the structure and function of the gastrointestinal, cardiovascular, immunological, respiratory, excretory and reproductive systems with an emphasis on the maintenance of homeostasis. Laboratory exercises include histological examinations, anatomical dissections and physiological experiments using human subjects. (1026-350 or permission of instructor) **Class 4, Lab 3, Credit 5 (W)**

**1026-365 Physiology and Anatomy for Engineers II**  
The second of a two-quarter sequence designed for engineering students enrolled in the biomedical and bioengineering options that offers an integrated approach with an emphasis on structure and function of the cardiovascular, respiratory and excretory systems. Additional information includes details of the gastrointestinal and immune systems. Laboratory exercises include anatomical study and physiological experiments with a focus on cardiovascular and respiratory systems. This course does not meet premed requirements. **Class 6, Credit 4 (W)**

**1026-501 Medical Botany**  
This course is intended to introduce the student to the subject of medical botany. A detailed study will be made of those members of the plant kingdom that are medically useful in preventing, treating or curing disease states. Where possible, the active chemical ingredient(s) will be defined for each medicinal plant described. Emphasis will be on those plant substances that are useful in the treatment of cancers, nervous system disorders, heart and circulatory diseases, metabolic disorders, sensory organ diseases, dental disease, gastrointestinal disorders, respiratory diseases, urogenital diseases, skin diseases, infections and mental disorders. When available, the data from clinical trials and clinical studies will be discussed. (1001-203 and 1013-233) **Class 3, Credit 3 (W) (offered alternate years)**

**1026-519 Radiation Protection**  
A course designed to familiarize the student with the daily routine of safe handling of radioactive materials. Radiation protection, licensing regulations, decontamination procedures, waste disposal and area surveys are covered. **Course 2, Credit 2 (W)**

**1026-540 Undergraduate Biomedical Science Research**  
An undergraduate-level introduction to research that affords students the chance to work under the guidance of a faculty mentor in learning about applications of the scientific method to established scientific problems and questions. Students are required to enroll in at least two quarters of undergraduate research in consecutive quarters and, under guidance of the research mentor, to report results in a public forum such as a written report, poster and/or oral presentation. (Permission of research adviser and approval by biomedical sciences program director) **Class/Lab variable, Credit variable (F, W, S, SU)**

**1026-541 Undergraduate Biomedical Science Research**  
An undergraduate-level introduction to research that affords students the chance to work under the guidance of a faculty mentor in learning about applications of the scientific method to established scientific problems and questions. Students are required to enroll in at least two quarters of undergraduate research in consecutive quarters and, under guidance of the research mentor, to report results in a public forum such as a written report, poster and/or oral presentation. (Permission of research adviser and approval by biomedical sciences program director) **Class/Lab variable, Credit variable (F, W, S, SU)**

**1026-542 Undergraduate Biomedical Science Research**  
An undergraduatelevel introduction to research that affords students the chance to work under the guidance of a faculty mentor in learning about applications of the scientific method to established scientific problems and questions. Students are required to enroll in at least two quarters of undergraduate research in consecutive quarters and, under guidance of the research mentor, to report results in a public forum such as a written report, poster and/or oral presentation. (Permission of research adviser and approval by biomedical sciences program director) **Class/Lab variable, Credit variable (F, W, S, SU)**

**1026-559 Special Topics: Medical Sciences**  
Advanced courses that are of current interest and/or logical continuations of the courses already being offered. These courses are structured as ordinary courses and have specified prerequisites, contact hours and examination procedures. **Class variable, Credit variable (F, W, S)**

**1026-599 Independent Study: Medical Sciences**  
Faculty-directed study of appropriate topics on a tutorial basis. Enables an individual to pursue studies of existing knowledge available in the literature. **Class variable, Credit variable (F, W, S)**

**1030-405 Cardiac Anatomy and Physiology**  
Course is designed to provide students an opportunity to learn the basic anatomy, physiology, pathophysiology and terminology of the heart. Standard views, image, orientation, ultrasound appearance and measurements will be stressed. Students will be required to dissect and label all sections of the human heart. Students are guided in the learning process by lecture and self-paced laboratory experience. (First year in the ultrasound program or permission of instructor) **Class 3, Credit 3 (F)**

**1030-408 Echocardiography Scanning**  
Course is designed to provide students with the opportunity to learn cardiac imaging procedures, sectional anatomy and patient positions. Standard views, image orientation, ultrasound appearance and measurements will be stressed. (First year in the echocardiography program or permission of instructor) **Class 2, Credit 2 (F)**



**1030-409** **Ultrasound Instrumentation I**  
Principles of ultrasound physics are directly applied to the use of ultrasound instrumentation in medical imaging. Transducers, signal production, memory systems, data display, manipulation of controls and artifacts are discussed. Considered as a pivotal course in which the student learns to integrate previous knowledge of anatomy with ultrasound physics and instrumentation. Considered a prerequisite course for Ultrasound Instrumentation II (1030-410). Emphasis is on the creation of high-quality images on laboratory ultrasound equipment. (Third year in the ultrasound program or permission of instructor) **Class 4, Credit 4 (W)**

**1030-410** **Ultrasound Instrumentation II**  
This course is a continuation of Ultrasound Instrumentation I (1030-409). It provides a foundation of the basic physical principles of ultrasound and the fundamentals of fluid dynamics; Doppler physics, including color, power and spectral Doppler; quality control; Doppler artifacts; and biological effects. Considered a pivotal course in which the student learns to integrate previous knowledge of anatomy, ultrasound physics and instrumentation with Doppler skills and techniques. Development of scanning techniques, use of instrument controls and production of high quality diagnostic images utilizing laboratory equipment are stressed. (Third year in the ultrasound program or permission of instructor) **Class 4, Credit 4 (S)**

**1030-412** **Cross-sectional Anatomy**  
Basic sectional anatomy of the abdomen and pelvis is discussed. The course builds on the basic knowledge of anatomy and prepares the student to recognize sectional anatomy of major human structures, especially as they relate to medical imaging techniques. Lectures are augmented with exercises using prepared human sections, organ modeling and diagnostic imaging units. (1026-350, 360 or permission of instructor) **Class 4, Credit 4 (W)**

**1030-414** **General Vascular Evaluation**  
Provides basic knowledge of general vascular evaluation with an emphasis on the sonographic approach. Two-dimensional real-time imaging and Doppler techniques are presented as well as a discussion of other imaging modalities and their use in vascular evaluation. Performance of examinations on laboratory equipment is stressed. This is an internship course. (Fourth year in the ultrasound program or permission of faculty) **Class 4, Credit 4 (S)**

**1030-420** **Electrophysiology and Cardiac Pharmacology**  
This course exposes the student to the role of the electrocardiogram in clinical medicine and its correlation with the echocardiographic examination. The student learns how to perform a 12-lead electrocardiogram and interpret a normal EKG. Abnormal EKG morphology, conduction disturbances and rhythms are taught. Implications of abnormalities are discussed. (First year in the ultrasound program or permission of instructor) **Class 3, Credit 3 (W)**

**1030-501** **Echocardiography I**  
This course is designed to provide the echocardiography student with the necessary foundation of knowledge and understanding to deal with the patient in a clinical context. It also provides the student with the information necessary to perform basic and sophisticated cardiac procedures utilizing 2-D imaging, M-mode, spectral and color Doppler. High-quality image production, recognition of normal cardiac structures and pathologic states relating to various types of cardiomyopathy and cardiac transplantation are stressed. Examination protocols for various procedures, review of anatomy, film reading and use of other scanning techniques and modalities are addressed. This is an internship course. (Second year in the ultrasound program or permission of instructor) **Class 3, Credit 3 (F)**

**1030-502** **Echocardiography II**  
A continuation of 1030-501. The course is designed to provide the echocardiography student with the necessary foundation of knowledge and understanding to deal with the patient in a clinical context. It also provides the student with the information necessary to perform basic and sophisticated cardiac procedures utilizing 2-D imaging, M mode, spectral and color Doppler. High-quality image production, recognition of normal cardiac structures and pathologic states relating to murmurs, valvular heart disease, and surgical intervention are stressed. Examination protocols for various procedures, review of anatomy, film reading and use of other scanning techniques and modalities are addressed. This is an internship course. (Second year in the ultrasound program or permission of instructor) **Class 3, Credit 3 (W)**

**1030-503** **Echocardiography III**  
This course is a continuation of 1030-502. High-quality image production, recognition of normal cardiac structures and pathologic states relating to cardiac diseases secondary to systemic illness, infiltrative heart, neuromuscular, and connective tissue diseases, endocrine and nutritional diseases, hematological disorders, AIDS, and pericardial diseases, cardiac tumors and thrombi, and diseases of the great vessels are stressed. Examination protocols for various procedures, review of anatomy, film reading and use of other scanning techniques and modalities are addressed. This is an internship course. (Second year in the ultrasound program or permission of instructor) **Class 3, Credit 3 (S)**

**1030-510** **Ischemic Heart Disease: Stress Echocardiography**  
This course is an introduction to stress echocardiography. Emphasis is on the basic coronary artery anatomy, physiology, pathophysiology, medical indications, fundamental principles, technique and scan interpretation. Various methods of stress echocardiography such as digital, exercise and pharmacological echocardiography are stressed. Students observe and perform these procedures during a clinical internship. This is an internship course. (Second year in the ultrasound program or permission of instructor) **Class 2, Credit 2 (F)**

**1030-515** **Cardiac M-mode**  
Classroom and laboratory experience will provide the candidate with basic knowledge necessary to perform M-mode scans. High-quality image production, measurements, recognition of normal structures and basic pathologic states will be stressed. Examination protocols, review of specific anatomy, film reading and use of other scanning techniques will be addressed. This is an internship course. (Second year in the ultrasound program or permission of instructor) **Class 2, Credit 2 (F)**

**1030-520** **Clinical Echocardiography I**  
This course prepares the student for application of classroom knowledge to the practice of ultrasound by means of a clinical internship. The course is designed to equip the student with the practical skills and clinical knowledge necessary to perform basic echocardiography examinations. Image production, recognition and acceptability are stressed; examination protocols are outlined. Nursing procedures, ethical issues and medico-legal considerations also are discussed as they relate to the practice of echocardiography examination. Instruction also includes review of teaching files and discussion of new techniques and research trends. This is an internship course. (Second year in the ultrasound program or permission of instructor) **Class 7, Credit 7 (F)**

**1030-521** **Clinical Echocardiography II**  
Further prepares the candidate for application of classroom knowledge to the practice of echocardiography by means of a clinical internship. Performing basic, general echocardiography examinations in both the laboratory and clinical settings are stressed. The candidate is expected to perform basic examinations with little, if any, assistance by the end of this course. This is an internship course. (Second year in the ultrasound program or permission of instructor) **Class 7, Credit 7 (W)**

**1030-522** **Clinical Echocardiography III**  
This course further prepares the student for application of classroom knowledge to the practice of echocardiography by means of a clinical internship. Performing comprehensive echocardiography examinations in both the laboratory and clinical settings will be stressed. The candidate will be expected to perform comprehensive examinations with no assistance. The candidate is also expected to perform an intensive review of all principles related to echocardiography in preparation for comprehensive written and oral examinations. This is an internship course. (Second year in the ultrasound program or permission of instructor) **Class 7, Credit 7 (S)**

**1030-525** **Seminar in Echocardiography**  
This course is designed to introduce the student to the role of the echocardiographer in the medical field. Speaking, writing and researching skills are explored. This course also presents methods for researching a selected topic, developing paper-writing strategies and making oral presentations. Students will research a topic and prepare a written document following common publishing guidelines in addition to making oral presentations. This is an internship course. (Second year in the ultrasound program or permission of instructor) **Class 2, Credit 2 (W)**

- 1030-530** **Congenital Heart Disease I**  
These courses are designed to provide the echocardiography student with the necessary foundation of knowledge and understanding of congenital heart disease with an emphasis on the ultrasound approach. Two-dimensional real-time imaging and Doppler techniques are presented. Performance on laboratory equipment is stressed. This is an internship course. (Second year in the ultrasound program or permission of instructor) **Class 2, Credit 2 (W)**
- 1030-531** **Congenital Heart Disease II**  
A continuation of 1030-530. This course is designed to provide the echocardiography student with the necessary foundation of knowledge and understanding of advanced congenital heart disease with an emphasis on the ultrasound approach. Two-dimensional real-time imaging and Doppler techniques are presented. Performance on laboratory equipment is stressed. This is an internship course. (Second year in the ultrasound program or permission of instructor) **Class 2, Credit 2 (S)**
- 1030-552** **Introduction to Obstetrical Ultrasound**  
Provides the ultrasound candidate with basic knowledge necessary to perform obstetrical examinations. High-quality image production, recognition of normal structures and basic pathologic states are stressed. Examination protocols, review of specific anatomy, film reading and use of other imaging techniques are addressed. This is an internship course. (Fourth year in the ultrasound program or permission of faculty) **Class 3, Credit 3 (F)**
- 1030-553** **Introduction to Gynecological Ultrasound**  
Information necessary to perform basic gynecologic sonographic examinations is presented. Examination strategies for various procedures are explored as well as the integration of ultrasound into established clinical practices. This is an internship course. (Fourth year in the ultrasound program or permission of faculty) **Class 3, Credit 3 (F)**
- 1030-554** **Advanced Obstetrical Ultrasound**  
Provides information necessary to perform more sophisticated obstetrical procedures utilizing ultrasound. Examination strategies for various procedures are explored as well as the integration of ultrasound into established clinical practices. This is an internship course. (Fourth year standing in ultrasound program or permission of faculty) **Class 4, Credit 4 (W)**
- 1030-556** **Abdominal Ultrasound I**  
Laboratory simulation and classroom instruction are used to develop practical skills and clinical knowledge necessary to perform basic abdominal examinations utilizing ultrasound. High-quality image production, recognition of normal abdominal structures and basic pathologic states are stressed. Examination protocols, review of anatomy, film reading and use of other scanning techniques are addressed. This is an internship course. (Fourth year standing in ultrasound program or permission of faculty) **Class 3, Credit 3 (F)**
- 1030-557** **Abdominal Ultrasound II**  
A continuation of 1030-556. Laboratory simulation and classroom instruction are used to develop practical skills and clinical knowledge necessary to perform basic abdominal examinations utilizing ultrasound. High-quality image production, recognition of normal abdominal structures and basic pathologic states are stressed. Examination protocols, review of anatomy, film reading and use of other scanning techniques are addressed. This is an internship course. (Fourth year in the ultrasound program or permission of faculty) **Class 3, Credit 3 (F)**
- 1030-558** **Small Parts Ultrasound**  
Provides the classroom and clinical knowledge necessary to perform basic sonographic examination of anatomy classified as small parts, usually utilizing specialized equipment and high megahertz frequencies. Examination strategies for various procedures are discussed as well as the role of ultrasound in established clinical practices utilizing small parts imaging. This is an internship course. (Fourth year in the ultrasound program or permission of faculty) **Credit 3 (S)**
- 1030-560** **Seminar in Ultrasound**  
Candidates prepare a complete plan for an ultrasound department as if they had been hired to establish a new department in a hospital setting. The candidates work together to develop the physical, administrative and financial aspects of a department. This is an internship course. (Fourth year in the ultrasound program or permission of faculty) **Class 2, Credit 2 (S)**
- 1030-561** **Advanced Seminar in Ultrasound**  
Speaking, writing and researching skills are explored, including methods of basic research, developing writing strategies and oral presentations. Students develop or critique a research project and prepare a written document following common publishing guidelines in addition to making oral presentations. This is an internship course. (Fourth year in the ultrasound program or permission of faculty) **Class 2, Credit 2 (W)**
- 1030-565** **Echocardiography Special Procedures**  
This course introduces the echocardiography student to the various techniques, procedures and skills necessary to evaluate the heart. Topics include transesophageal and contrast echocardiography as well as pericardiocentesis. The role of echocardiography in emergency medicine, operating rooms and intensive care units is stressed. This is an internship course. (Second year in the ultrasound program or permission of instructor) **Class 2, Credit 2 (S)**
- 1030-570** **Clinical Diagnostic Medical Sonography I**  
Prepares the student for application of classroom knowledge to the practice of ultrasound by means of a clinical internship. Performing basic, general ultrasound examinations in both the laboratory and clinical settings is stressed. Nursing procedures, ethical issues and medico-legal considerations also are discussed as they relate to the practice of ultrasound examination. This is an internship course. (Fourth year in the ultrasound program or permission of director) **Credit 7 (F)**
- 1030-571** **Clinical Diagnostic Medical Sonography II**  
Further prepares the candidate for application of classroom knowledge to the practice of ultrasound by means of a clinical internship. Performing basic, general ultrasound examinations in both the laboratory and clinical settings is stressed. The candidate is expected to perform basic examinations with little, if any, assistance by the end of this course. This is an internship course. (Fourth year in the ultrasound program or permission of director; 1030-570) **Credit 7 (W)**
- 1030-572** **Clinical Diagnostic Medical Sonography III**  
Final development of ultrasound examination skills by means of clinical internship. The candidate is expected to perform general ultrasound examinations with no assistance by the end of this course. This is an internship course. (Fourth year in the ultrasound program or permission of director; 1030-571) **Credit 7 (S)**
- 1032-200** **Behavioral Medicine**  
Familiarizes physician assistant students with biological concepts and the human life cycle. Provides students with a foundation in basic psychopathology and its relationship to understanding human illness. Addresses basic principles of patient care in the context of biopsychosocial, cultural and ethical issues while examining social structures in contemporary Western society. (Third year in the PA program) **Credit 2 (S)**
- 1032-201** **Early Clinical Experience I**  
This course brings together first-year physician assistant students to evaluate the role of the PA as a critical member of the health care team. A thorough understanding of the duties and training of colleagues in the many health professions is critical to performing as a PA. The numerous professions and their training and education—from clerical staff to physician supervisors—are researched and discussed. Team building exercises are an important aspect of the course. **Class 2, Credit 1 (W)**
- 1032-202** **Early Clinical Experience II**  
A continuation of 1032-201, this class begins to examine the various aspects that make our future patients different. Comparing cultural, racial and religious differences is the main focus of this course. Other issues such as sexual orientation and socioeconomic status are also discussed. Students will draw on their own experiences to contribute to the learning process. Attitudes toward diversity are assessed and their impact on patient care is examined. Service learning is a mandatory and critical component of this course. (1032-201) **Class 2, Credit 1 (S)**
- 1032-203** **Early Clinical Experience III**  
In this continuation of 1032-201 and 202, students will continue to look at important characteristics of the populations they will serve as clinicians. Topics of domestic violence, child abuse, drug addiction and alcohol abuse are presented. Students will also learn about the demographic and sociographic features of the growing geriatric population. A group community service project and presentation of the project concludes this three-course sequence. (1032-201, 202) **Class 2, Credit 1 (F)**

- 1032-210 Physician Assistant Seminar**  
Introduces the student to the role of the physician assistant in the relationship to patients, supervising physicians, colleagues and other physician assistants. Emphasis is on developing a high degree of professionalism in conjunction with health care. Topics include legislation, certification, registration, professional organizations, sociomedical issues, ethics, legal and economic aspects of medicine, health care organization and medical records. (Second or third year in the PA program) **Class 1, Credit 1 (W)**
- 1032-330 Law and Medicine**  
This course will provide an overview of health care law, principles and ethics as it relates to the health care provider. Lecture topics will cover an introduction to law, criminal aspects of health care, patient consent issues, legal reporting obligations, contracts and antitrust, information management and health care records, HIPPA regulations, legal risk to the health care provider, end of life issues and malpractice issues. (Third year in the PA program or permission of instructor) **Class 2, Credit 2 (W)**
- 1032-401 Patient History and Physical Exam I**  
This first part of a three-quarter sequence introduces and develops the clinical psychosocial skills and anatomic/physiologic science involved in interviewing and examining patients. Includes practical medical terminology, attitude development and values clarification strategies to aid students in adopting a humanistic approach, interviewing techniques used during patient interaction, comprehensive database, demonstrated techniques for a complete physical examination of all body systems and explanation/implementation of the problem-oriented medical record (POMR). Weekly patient contact. (Third year in the PA program or permission of instructor) **Class 2, Credit 2 (F)**
- 1032-402 Patient History and Physical Exam II**  
This second part of a three-quarter sequence introduces and develops the clinical psychosocial skills and anatomic/physiologic science involved in interviewing and examining patients. Includes performing and writing complete, accurate medical histories and physical examinations with small group instruction. Weekly patient contact. (1032-401) **Class 1, Credit 2 (W)**
- 1032-403 Patient History and Physical Exam III**  
This final part of a three-quarter sequence introduces and develops the clinical psychosocial skills and anatomic/physiologic science involved in interviewing and examining patients. Includes a critical analysis of students performing and writing complete, accurate medical histories and physical examinations. Small group instruction. Weekly patient contact. (1032-402) **Class 1, Credit 2 (S)**
- 1032-406 Medical Microbiology**  
Provides physician assistant students with the understanding of the biology of human pathogens. The students study how this understanding impacts therapeutic modalities for the treatment of human disease. Students have the opportunity to master specific skills that will be central to their roles as practicing physician assistants. (Second year in the PA program) **Credit 4 (S)**
- 1032-410 Clinical Skills**  
Provides for the PA student requisite skills for professional courses and internships. Emphasis is on developing competence in basic skills in conjunction with patient care. (Third year in the PA program or permission of instructor) **Class 1, Credit 1 (S)**
- 1032-420 Clinical Pharmacology I**  
A study of the mechanics of medications: indications, effects, distribution, absorption, metabolism, excretion, interactions, pharmacokinetics and administration/dosing. Emphasizes agents commonly prescribed in the diagnosis and treatment of disease. A body systems approach is utilized to study cardiology, pulmonology, infectious diseases, dental diseases, otorhinolaryngology, neurology and ophthalmology. (Third year in the PA program or permission of instructor) **Class 3, Credit 3 (F)**
- 1032-421 Clinical Pharmacology II**  
Continuation of 1032-420: Indications, effects, distribution, absorption, metabolism, excretion, interactions, pharmacokinetics and administration/dosing. Emphasizes agents commonly prescribed in the diagnosis and treatment of disease. A body systems approach is utilized to study fluids/electrolytes/nutrition, gastroenterology, nephrology, urology, endocrinology and dermatology. (1032-420) **Class 3, Credit 3 (W)**
- 1032-422 Clinical Pharmacology III**  
Continuation of 1032-421: Indications, effects, distribution, absorption, metabolism, excretion, interactions, pharmacokinetics and administration/dosing. Emphasizes agents commonly prescribed in the diagnosis and treatment of disease. A body systems approach is utilized to study hematology, obstetrics, gynecology, orthopedics, surgery, geriatrics, pediatrics and psychiatry. Prescribing and dispensing are discussed. (1032-421) **Class 2, Credit 2 (S)**
- 1032-424 Pathophysiology I**  
Pathophysiology is the systematic study of abnormal cell and organ function. The goal in medical practice is to rationally and systematically assess this abnormal function when making a diagnosis and then to reverse the pathological process using therapy. This course will introduce the physician assistant student to normal and abnormal function of cells in general and then how these cellular abnormalities affect function of certain organ systems. The systems to be covered include the musculoskeletal, thyroid, liver, pancreas, heart/circulatory and renal. The students will also be introduced to laboratory markers of abnormal organ function. Using the knowledge acquired in this class, students will predict common clinical and laboratory manifestations of important disease states. (Third-year PA program status) (Corequisites 1032-401, 420, 440) **Class 4, Credit 4 (F)**
- 1032-425 Pathophysiology II**  
This course is a continuation of 1032-424 and will introduce the physician assistant student to normal and abnormal function of cells and organ function. The systems to be covered this quarter include the renal (continued), hematologic and immunologic systems. In addition, students will be introduced to mechanisms and manifestations of neoplasia and general principles of cancer diagnosis. The students will be introduced to laboratory markers of abnormal organ function. Using the knowledge acquired in this class, students will work in small groups and present the results of their critical evaluation of assigned clinical case presentations. (Third-year PA program status) (1032-424, corequisites 1032-402, 421, 441) **Class 4, Credit 4 (W)**
- 1032-430 Clinical Diagnostic Imaging**  
Introduces PA students to the principles of diagnostic imaging: physical foundations, recognition of gross abnormalities, determination of a diagnostic impression and application of different diagnostic procedures. Emphasis is on correlating body systems with findings of specific radiographic studies. (Third year in the PA program or permission of instructor) **Class 1, Credit 1 (S)**
- 1032-440 Clinical Medicine I**  
The clinical medicine courses give the PA student the necessary foundation of knowledge and understanding to deal with the patient in the clinical context. This preparation precedes the clinical rotations in which students apply their knowledge in examining patients and expand their expertise in evaluation, clinical procedures and problem solving. A body systems approach is utilized to study cardiology, pulmonology, nephrology, hematology, psychiatry and obstetrics/gynecology. (Third year in the PA program or permission of instructor) **Class 15, Credit 4 (F)**
- 1032-441 Clinical Medicine II**  
Continuation of 1032-440. This section covers fluids/electrolytes/nutrition, gastroenterology, neurology, orthopedics, rheumatology/allergy, infectious disease, endocrinology and dermatology. (1032-440) **Class 15, Credit 4 (W)**
- 1032-442 Clinical Medicine III**  
Continuation of 1032-441. Further areas of study encompass emergency medicine, oncology, ophthalmology, dermatology and preventive medicine, surgery, geriatrics, pediatrics. (1032-441) **Class 15, Credit 4 (S)**
- 1032-490 Physician Assistant Clinical Rotation I**  
Mandatory rotations are in fields of general clinical practice that build a solid basic understanding and groundwork. These required rotations are inpatient medicine, family practice, orthopedics, emergency medicine, OB/GYN, pediatrics, general surgery, geriatrics, and psychiatry. Students also are able to select one elective rotation, which allow students to individualize their experiences according to their own areas of interest. (Fourth year in the PA program) **Credit 12 (SU)**
- 1032-491 Physician Assistant Clinical Rotation II**  
Continuation of PA Clinical Rotation I. (Fourth-year standing in PA program) **Credit 12 (F)**
- 1032-492 Physician Assistant Clinical Rotation III**  
Continuation of PA Clinical Rotation II. (Fourth-year standing in PA program) **Credit 12 (W)**

**1032-493** **Physician Assistant Clinical Rotation IV**  
Continuation of PA Clinical Rotation III. (Fourth-year standing in PA program) **Credit 12 (S)**

## Imaging Science

**1051-200** **Imaging Science First Year Seminar**  
An introduction to academic and student life in the College of Science and the Center for Imaging Science. Topics covered will include a history of imaging science, Wallace Library and basic library skills, resources for student life, campus and laboratory safety practices, the Office of Cooperative Education and Career Services, and résumé and cover letter writing. **Class 1, Credit 1 (F)**

**1051-204** **Imaging in the Physical Sciences**  
This course presents a survey of the field of imaging science and its applications by examining representative imaging systems from the imaging chain perspective. Fundamental properties and characteristics of light, optics and sensors, as well as fundamental principles of image processing, are presented and explored through lab experiments and analysis of familiar imaging systems (e.g., traditional film and digital cameras, telescopes, medical X-ray systems, consumer video systems, copy machines, laser and ink-jet printers, and fax machines). Students explore how imaging techniques are applied to representative scientific problems from fields such as medical science, remote sensing and astronomy. (Corequisite 1016-214, 271, or 281) **Class 3, Lab 3, Credit 4 (F, W)**

**1051-211** **Programming for Imaging Science**  
This course will introduce the student to the IDL environment as a data visualization tool and a programming language. The student will learn the various capabilities of the package and how they can rapidly prototype solutions to various science and engineering problems. As these solutions are developed, fundamental concepts of programming and data structures will be introduced. Programming assignments will include fundamental imaging related problems and will work with scalar, vector and array processes. This course will emphasize the need for concrete problem definition, problem decomposition into smaller sub-problems, implementation/testing, and presentation/documentation of the algorithm and results. (Algebra and trigonometry) **Class 4, Credit 4 (F)**

**1051-215** **Imaging Science Fundamentals**  
An exploration of the fundamentals of imaging science and the imaging systems of the past, present and future. Imaging systems studied include the human visual system, consumer and entertainment applications (e.g., traditional and digital photography, television, digital television and HDTV, virtual reality); medical applications (e.g., X-ray, ultrasound, MRI); business/document applications (e.g., impact and non-impact printing, scanners, printers, fax machines, copiers); and systems used in remote sensing and astronomy (e.g., night-vision systems, ground- and satellite-based observatories). The laboratory component includes experiments related to the principles and theories discussed in the corresponding lecture. Laboratory experiments give students experience with many imaging systems and exposure to the underlying scientific principles. (Competency in algebra) **Class 3, Lab 2, Credit 4 (F, W)**

**1051-217** **Fundamentals of Astronomical Imaging**  
Familiarizes students with the goals and techniques of astronomical imaging. The broad nature of astronomical sources will be outlined in terms of requirements on astronomical imaging systems. These requirements are then investigated in the context of the astronomical imaging chain. Imaging chains in the optical, X-ray and/or radio wavelength regimes will be studied in detail as time permits. Laboratory assignments will range from construction and characterization of a hand-held telescope to analysis of images collected at the RIT Observatory. (1051-215 or permission of instructor) **Class 3, Lab 2, Credit 4 (W)**

**1051-235** **Special Topics: Imaging Science**  
Topics of special interest, varying from quarter to quarter, selected from the field of imaging science and not currently offered in the curriculum. Specific topics are announced in advance. (Not offered every quarter; consult director of the Center for Imaging Science) **Class variable, Credit variable**

**1051-300** **Introduction to Imaging Systems**  
This course provides a framework for the study of imaging science in the remainder of the imaging science curriculum. Elements of imaging science taxonomy, including the imaging chain, image analysis and imaging systems characterization are introduced or reviewed. Practical examples drawn from familiar imaging systems such as digital and film still cameras, LCD displays, NTSC video, etc. are introduced, and selected systems are studied in depth. Current events in the development or use of imaging science will be incorporated at the discretion of the instructor to reinforce understanding of the structure of the field of imaging science. The student will master basic laboratory skills in the use of still and video cameras, including effects and control of illumination, exposure, focus and depth of field, focal length, dark and flat-field calibration. (1016-282, 1017-311, or equivalent) **Class 3, Lab 3, Credit 4 (F)**

**1051-303** **Geometrical Optics**  
This course introduces the description of optical imaging systems based on the ray model of light. Topics include refraction, reflection, imaging with lenses, stops and pupils, and optical system design using computer software. (1017-313) **Class 3, Lab 3, Credit 4 (W)**

**1051-313** **Interactions Between Light and Matter**  
Fundamental aspects of the interaction of electromagnetic radiation and materials. The course is designed to provide students with an understanding of the physical mechanisms underlying instruments used to detect, measure and image electromagnetic energy (CCDs, silver halide film, OPC, vidicon, etc.). Basic concepts of quantum theory, atomic structure and the particle/wave duality of light and matter are introduced. Electronic transitions in materials and the physical and chemical results of light absorption are explored, with practical examples in image detection. Applications in detector sensitivity, spectroscopy, human vision and colorimetry will be touched on. (1016-283, 1017-314) **Class 4, Credit 4 (F)**

**1051-320** **Linear Mathematics for Imaging**  
This course applies the concepts of complex numbers, vectors and matrices to represent models of discrete linear imaging systems. Representations of discrete imaging systems are considered and the representation in the frequency domain is derived via the discrete Fourier transform. The continuous Fourier transform is introduced. (1016-305) **Class 4, Credit 4 (W)**

**1051-350** **Vision and Psychophysics**  
The final "component" in many imaging systems is visual perception. The human visual system can be considered an imaging system itself—and arguably the most complex system—from visual optics through high-level cortical processing such as the perception of depth and motion. An understanding of the characteristics and limitations of the visual system aids in designing and evaluating imaging systems. Unlike other elements of imaging systems, it is difficult or impossible to get objective measures of visual perception; psychophysics provides tools for measuring perceptual mechanisms. This course presents an overview of the organization and function of the human visual system and some of the psychophysical techniques used to study visual perception. (1051-300 or permission of instructor) **Class 4, Credit 4 (W)**

**1051-361** **Digital Image Processing I**  
This course is an introduction to the basic concepts of digital image processing. The student will be exposed to image capture and image formation methodologies, sampling and quantization concepts, statistical descriptors and enhancement techniques based on the image histogram, point processing and neighborhood processing, and global processing techniques based on kernel operations and discrete convolutions as well as the frequency domain equivalents, geometrical operations for scale and rotation, and grey-level resampling techniques. Emphasis is on applications and efficient algorithmic implementation using the IDL programming language. (1016-283, 1016-305, 1051-211 or equivalent) **Class 4, Credit 4 (F)**

**1051-370** **Radiometry**  
This course introduces the concepts of quantitative measurement of electromagnetic energy. The basic radiometry terms are introduced using calculus-based definitions. Governing equations for source propagation and sensor output are derived. Simple source concepts are reviewed, and detector figures of merit are introduced and used in problem solving. The radiometric concepts are then applied to simple imaging systems so that a student could make quantitative measurements with imaging instruments. (1016-283, 1017-313) **Class 3, Lab 3, Credit 4 (S)**

- 1051-402** **Color Science**  
This course presents an introduction to color perception, measurement and reproduction. Based on an understanding of the human visual system, psychophysics, and radiometric measurements and computations, this course explores in more detail the basis of color perception, applies those principles to the measurement of color stimuli and then explores applications of color science in imaging. (1051-350, 370) **Class 4, Credit 4 (F)**
- 1051-420** **Environmental Applications of Remote Sensing**  
An introduction to the wide range of environmental applications of remote sensing. Systems for detecting physical phenomena and analysis techniques for extracting useful information are described for active and passive sensors operating throughout the electromagnetic spectrum from both airborne and spaceborne sensors. The Earth's atmospheric, hydrospheric and terrestrial processes are examined at a global scale. Application areas studied include monitoring vegetation health, identifying cultural features, assessing water resources and detecting pollution and natural hazards. (1017-213 or permission of instructor) **Class 4, Credit 4 (W)**
- 1051-446** **Multi-wavelength Astronomical Imaging**  
Survey of modern imaging techniques in astronomy. Students analyze astronomical imaging systems in terms of the requirements placed on the systems and the strengths and limitations of each component in the imaging chain. Examples of specific techniques covered include optical CCD cameras and spectrometers, X-ray CCD imaging spectroscopy, and radio molecular mapping. (1017-314, 1017-301 also recommended) **Class 3, Lab 1, Credit 4 (S)**
- 1051-451** **Imaging Systems Analysis I: Tone Transfer Function**  
This course applies the mathematical and computational skills acquired in previous courses to the analysis and modeling of mean-value tone propagation through both linear and non-linear imaging systems of both discrete and continuous processes. System modeling techniques will be described based on empirical metrics of system components and underlying physical mechanisms of imaging processes. Modeling of multi-channel systems will emphasize the analysis of inter-image characteristics and the impact of spectral sensitivity on information content in the output image. (1051-211, 1051-320) **Class 3, Lab 3, Credit 4 (F)**
- 1051-452** **ISA II: Resolution, MTF and Spatial Artifacts**  
This course applies the mathematical and computational skills acquired in previous courses to the analysis and modeling of spatial properties of both linear and non-linear systems of both discrete and continuous processes. Experimental techniques for measuring resolution, MTF, CTF, PSF and LSF of individual and complex systems will be described. These functions will be modeled mathematically for both individual imaging processes and for sequences of linear and nonlinear processes. Physical mechanisms (including finite detectors and sampling, optical turbidity and electronic time constraints) will be treated mathematically for their impact on MTF. (1051-451) **Class 3, Lab 3, Credit 4 (W)**
- 1051-453** **ISA III: Noise and Random Processes**  
This course applies the mathematical and computational skills acquired in previous courses to the analysis and modeling of noise and random processes in a sequence of imaging processes. Experimental techniques for measuring noise will be studied and practiced. Noise characteristics of imaging systems will be modeled based on mathematical probability and moment theory. Jacobian operators and Fourier theory will be used to model correlated noise and to propagate noise properties through complex sequences of imaging processes. Practical metrics of noise and signal/noise ratios will be examined for their utility as figures of merit for imaging systems. (1051-452, 1016-314) **Class 3, Lab 3, Credit 4 (S)**
- 1051-462** **Digital Image Processing II**  
This course is an introduction to the more advanced concepts of digital image processing. The student will be exposed to image reconstruction, noise sources and techniques for noise removal, information theory, image compression, video compression, wavelet transformations and the basics of digital watermarking. Emphasis is on applications and efficient algorithmic implementation using the IDL programming language. (1051-361) **Class 4, Credit 4 (W)**
- 1051-463** **Digital Image Processing III**  
This course discusses the digital image processing concepts and algorithms used for the analysis of hyperspectral, multispectral and multi-channel data in remote sensing and other application areas. Concepts are covered at the theoretical and implementation level using current, popular commercial software packages and high-level programming languages for examples, homework and programming assignments. The requisite multivariate statistics are presented as an extension of the univariate statistics to which the students have been previously exposed. Topics to be covered will include methods for supervised data classification, clustering algorithms and unsupervised classification, multispectral data transformations, data redundancy reduction techniques, image-to-image rectification, and data fusion for resolution enhancement. (1051-211 or equivalent, 1051-462, 1016-314) **Class 4, Credit 4 (S)**
- 1051-465** **Detectors**  
This course provides an overview of the underlying physical concepts, designs and characteristics of detectors used to sense electromagnetic radiation with wavelengths ranging from as short as X-rays to as long as millimeter radiation. The basic physical concepts common to many standard detector arrays will be reviewed. Some specific examples of detectors to be discussed include photomultipliers, microchannel plates, hybridized infrared arrays, PIN detectors and SIS mixers. The use of detectors in fields such as astronomy, high energy physics, medical imaging, and digital imaging will be discussed. (1051-313, 1051-370) **Class 3, Demonstration 1, Credit 4 (S)**
- 1051-499** **Imaging Science Co-op**  
Cooperative education experience for undergraduate imaging science students. **Credit 0 (offered every quarter)**
- 1051-501** **Research Practices**  
Develops skills in scientific research, including use of library resources, technical report writing, technical presentations. Students are required to research, write and present a proposal for a research project. The proposed research may be performed in 1051-502, 503. (Matriculation in SIMG) **Class 3, Credit 3 (S)**
- 1051-502, 503** **Senior Project I, II**  
Students perform the independent research project defined in 1051-501 under the direction of a faculty member in imaging science. The student presents the results of the project to a public meeting. **Class 1, Credit 4**
- 1051-528** **Design and Fabrication of a Solid State Camera**  
The purpose of this course is to provide the student with hands-on experience in building a CCD camera. The course provides the basics of CCD operation, including an overview, CCD clocking, analog output circuitry, cooling and evaluation criteria. (Senior status imaging science or permission of instructor) **Class 1.5, Lab 7.5, Credit 4 (W)**
- 1051-553** **Special Topics: Imaging Science**  
Topics of special interest, varying from quarter to quarter, selected from the field of imaging science and not currently offered in the curriculum. Specific topics are announced in advance. (Not offered each quarter; consult director of the Center for Imaging Science) **Class variable, Credit variable**
- 1051-599** **Independent Study**  
A student-proposed advanced project sponsored by an instructor. Approval required by the department chairperson and the director. Available to upper-level students with a GPA of 3.0 or greater. **Credit variable**

# National Technical Institute for the Deaf

## Index

0801	Accounting Technology	160
0804	Administrative Support Technology/Business Technology	161
0805	Applied Computer Technology	163
0806, 0887	Interdisciplinary Courses	158
0813	Computer Integrated Machining Technology	174
0825	Art and Computer Design	177
0827	Applied Optical Technology	165
0853	Pre-baccalaureate Studies	184
0855	Arts and Imgaing Studies	168
0875	ASL-English Interpretation	158
0876	Deaf Studies Certificate	187
0878	Digital Imaging & Publishing Technology	176
0879	Laboratory Science Technology	180
0880	Communication Studies and Humanities	172, 175, 180
0881	Performing Arts	175, 176, 183
0882	Social Sciences	176
0883	English	179
0884	Mathematics	182
0885	Science	184
0886	American Sign Language	162, 175, 176
0886	Deaf Studies	175
0890	Computer Aided Drafting Technology	173
0891	Automation Technologies	171

Course numbering: RIT courses are generally referred to by their seven-digit registration number. The first two digits refer to the college offering the course. The third and fourth digits identify the discipline within the college. The final three digits are unique to each course and identify whether the course is noncredit (less than 099); lower division (100–399); upper division (400–699); or graduate level (700 and above).

Unless otherwise noted, the following courses are offered annually. Specific times and dates can be found in each quarter's schedule of courses, published by the Office of the Registrar. Prerequisites and/or corequisites are noted in parentheses near the end of the course description.

## Interdisciplinary Courses

**0806-101 Job Search Process**  
Course goals are to prepare students to secure a cooperative or professional work experience in the student's major and to assist the student in acquiring the skills for accessing information, networking, developing résumés and letters, completing various employment-related forms, interviewing, and using various communication techniques in preparing students for the job search process. **Class 2, Credit 2 (F, W, S)**

**0806-201 Employment Seminar**  
Provides the student with an opportunity to synthesize a work experience with knowledge gained in technical and liberal arts courses in order to prepare for permanent employment. Experiences will include résumé revisions, further research into potential permanent employment, including accessing professional journals, electronic networks and interviewing for permanent employment. Discussions relating to financial considerations to be used in evaluating employment opportunities and individual roles with the organization will also be included. **Class 1, Credit 1 (F, W, S)**

**0887-200 Freshman Seminar**  
Provides entering NTID students with opportunities to enhance personal, social, intellectual, academic and ethical decision making in order to maximize their college experience. Students have opportunities to explore and negotiate the college environment, confront questions of identity and social roles, deal with ethical issues with faculty members and peer mentors, expand critical thinking skills, and learn and use academic skills. Course emphasizes student self-assessment of current strengths and areas of needed improvement along with development of plans for ongoing growth, rather than attainment of skill mastery within a quarter-length course. **Class 2, Credit 2 (F, W, S)**

**0887-210 Career Decision Making**  
This course provides students with information and experience regarding career choices and selecting a major using a career decision-making model. Students develop a career plan after completing career and self-assessments and gathering information from career and direct exposure to academic disciplines. Includes program sampling. (0887-200 or permission of CES department) **Class 2, Lab 1, Credit 2 (F, W, S)**

**0887-398 Special Topics - Interdisciplinary**  
**Credit variable (F, W, S)**

**0887-399 Independent Study - Interdisciplinary**  
**Credit variable (F, W, S)**

## ASL-English Interpretation

**0875-201 American Sign Language I**  
ASL I includes the linguistic features, cultural protocols and core vocabulary for students to function in basic ASL conversations that include ASL grammar for asking and answering questions while introducing oneself, exchanging personal information, talking about family, friends and surroundings, and discussing activities. This course is designed for students who have no knowledge of American Sign Language. To progress to the next course in the series (0875-202), students must complete course with a grade of C or better. **Class 4, Credit 4 (F, W, S, Su)**

**0875-202 American Sign Language II**  
This course expands the basic principles presented in ASL I. ASL II teaches students to use linguistic features, cultural protocols and core vocabulary to function in basic ASL conversations that include ASL grammar for giving directions, describing, making requests, talking about family, occupations and routines, and attributing qualities to others. To progress to the next course in the series (0875-203), students must complete course with a grade of C or better. (0875-201 with grade of C or better) **Class 4, Credit 4 (F, W, S)**

**0875-203 American Sign Language III**  
This course, the third in a series of six ASL courses, builds upon the ASL II foundation of skills and knowledge. The course focuses on the ASL features of time, subject/object, classifiers, non-manual behaviors and fingerspelling (including numbers and loan signs). In addition, ASL semantics and syntax (including conversational regulators) will be introduced. To progress to the next course in the series (0875-301), students must complete course with a grade of C or better. (0875-202 with grade of C or better) **Class 4, Credit 4 (W, S, Su)**

**0875-211 Intercultural Communication for Interpreters**  
Students examine their own cultural background and how this influences face-to-face interaction. Major concepts that will be addressed include the influence of culture, the relationship between language and culture, equivalence issues in translation, nonverbal communication and culture, cultural influences on context, stereotyping and prejudice, and developing strategies for improved intercultural communication. **Class 4, Credit 4 (F)**

**0875-212 Deaf Culture and Community**  
This course is designed to introduce students to aspects of Deaf culture and the deaf community. The distinction between these two groups will be reviewed and characteristics of both will be identified. Students will learn about the language, norms of behavior, values, traditions and possessions (materials) of D/deaf people. The evolution of a pathological view of D/deaf people to a cultural one will be analyzed from a historical and sociological perspective. Intercultural issues relating to the role of hearing people within the Deaf community will also be covered. (0875-302) **Class 4, Credit 4 (S)**

**0875-213 Introduction to the Field of Interpreting**  
This course provides students with information regarding the role and function of an interpreter. Information about the history of interpreting, terminology, employment options with regard to various settings, and the function of assessing as part of the interpreting process is presented. Additional topics include values and characteristics of a profession and cumulative trauma disorders (CTDs). **Class 4, Credit 4 (F)**

- 0875-300 Intermediate Fingerspelling and Number Skills Development**  
This course is designed to help students develop intermediate receptive and expressive fingerspelling and number skills. Students will develop expressive clarity and fluency suitable for signing. Attention will be on whole-word and phrase comprehension and expression in isolation; comprehension of fingerspelled words and numbers embedded in signed text; management strategies to request repetition of fingerspelled words and numbers; and production of short narratives that include fingerspelling, lexicalized fingerspelling and numbers. Students will be expected to produce fingerspelling and numbers clearly, accurately and without hesitation while signing. Spelling accuracy will also be required. (0875-301) **Class 4, Credit 4 (W)**
- 0875-301 American Sign Language IV**  
This course will continue to increase the grammatical features of ASL, introduces new grammatical features of ASL and specialized vocabulary, and continues to increase fingerspelling and numbers. In addition, some features of ASL discourse will be taught in organizing and explaining contextual information. To progress to the next course in the series (0875-302), students must complete course with a grade of C or better. (0875-203 with grade of C or better) **Class 4, Credit 4 (F)**
- 0875-302 American Sign Language V**  
This course is the fifth in a series of six ASL courses for interpreting students. This course continues to build on the foundation in the previous courses. Various structures of ASL discourse will be a focus of this class. Students continue learning and using vocabulary, fingerspelling, numbers and grammatical features of ASL. To progress to the next course in the series (0875-303), students must complete course with a grade of C or better. (0875-301 with grade of C or better) **Class 4, Credit 4 (W)**
- 0875-303 American Sign Language VI**  
This course is the last in a series of six for interpreting students, building upon the foundation in the previous courses. Students continue learning and using vocabulary, grammatical principles and discourse features related to narratives of ASL. Students will analyze multiple meaning English words and English idioms for expressing concepts in ASL. Issues related to Deaf culture will be continuously introduced based on topics introduced in each unit. (0875-302 with grade of C or better) **Class 4, Credit 4 (S)**
- 0875-310 Discourse Analysis for Interpreters**  
This course presents an in-depth look at the interpreter as bicultural/bilingual mediator at the center of communicative activity. The interpreter's communicative competence requires knowledge of what is appropriate in both the source-language and target-language communities. This course includes a study of conversational exchanges in English and ASL, including an analysis of conversational signals. (0875-301) **Class 4, Credit 4 (W)**
- 0875-311 Processing Skills Development**  
This course is an introduction to the mental processing skills (pre-interpreting skills) of consecutive and simultaneous interpretation. This course includes an overview of the theoretical models of interpretation, provides skill development activities for isolated interpreting sub-tasks and practice activities for the integration of these tasks in translation and consecutive interpreting activities. Course content includes interpreting theory, visualization, listening and comprehension, shadowing, paraphrasing, abstracting, dual task training, text analysis (including identification of main point, summarizing and structuring), cloze skills and translation. (0875-302) **Class 4, Credit 4 (S)**
- 0875-315 English to ASL Interpreting I**  
This is the first course in a three-course sequence in which students develop the ability to produce an equivalent ASL message from a spoken English source message. The focus of this course is text analysis and consecutive production of an equivalent message in the target language. Content also includes interpreting management strategies for spoken English to ASL interpreting. Students will interpret both rehearsed and unrehearsed monologues and dialogues. Warm-up exercises will be performed as part of the self-care regimen recommended for sign language interpreters. (0875-303, 311) **Class 4, Credit 4 (F)**
- 0875-316 ASL to English Interpreting I**  
This is the first course in a three-course sequence in which students develop the ability to produce an equivalent spoken English message from an ASL source message. The focus of this course is text analysis and consecutive production of an equivalent message in the target language. Content also includes interpreting management strategies for ASL to spoken English interpreting. Students will interpret both rehearsed and unrehearsed monologues and dialogues. Warm-up exercises will be performed as part of the self-care regimen recommended for sign language interpreters. (0875-302, 311) **Class 4, Credit 4 (F)**
- 0875-320 Practical and Ethical Applications**  
Students examine the underlying principles of the code of professional conduct and discuss application of the various situations and settings in which sign language interpreters work. Students will explore how professional interpreters apply these principles in their daily work and how deaf consumers perceive the ethical role and function of interpreters. In addition to ethical considerations, etiquette and protocol for each setting will be discussed. Settings include K-12, post-secondary, religious, medical, mental health, deaf-blind, performing arts, business and industry, and vocational rehabilitation. To progress to Practicum and Seminar I (0875-350), students must complete course with a grade of C or better. (0875-213, 315, 316) **Class 4, Credit 4 (W)**
- 0875-325 English to ASL Interpreting II**  
This is the second in a three-course sequence in which students develop the ability to produce an equivalent ASL message from a spoken English source message. Specific discipline areas will be addressed. Students will develop the ability to apply text analysis skills to the simultaneous English-to-ASL interpreting task. In addition, students will develop the ability to apply the principles of diagnostic feedback. One special area of emphasis will include affect equivalency between source and target languages. Warm-up exercises will be performed as part of the self-care regimen recommended for sign language interpreters. To progress to Practicum and Seminar I (0875-350), students must complete course with a grade of C or better. (0875-315 with a grade of C or better) **Class 4, Credit 4 (W)**
- 0875-326 ASL to English Interpreting II**  
This is the second in a three-course sequence in which students develop the ability to produce an equivalent English message from an ASL source message using simultaneous interpreting strategies. Specific discipline areas will be addressed. Students will develop the ability to apply text analysis skills to the simultaneous ASL-to-English interpreting task. In addition, students will develop the ability to apply the principles of diagnostic feedback. One special area of emphasis will include affect equivalency between source and target languages. Warm-up exercises will be performed as part of the self-care regimen recommended for sign language interpreters. To progress to Practicum and Seminar I (0875-350), students must complete course with a grade of C or better. (0875-316 with a grade of C or better) **Class 4, Credit 4 (W)**
- 0875-330 Introduction to Transliteration**  
This course is an introduction to the task of sign language transliteration. Students develop the ability to simultaneously transliterate from a spoken English message into an equivalent signed message while retaining English features. The focus of this course will be transliterating in post-secondary settings. Course work includes analysis and interpretation of the macrostructure and microstructure of academic texts, translation of frozen texts, an introduction to team interpreting, and production of transliterations that are appropriate for contact language situations. Students will work with rehearsed and unrehearsed texts of short duration. (0875-325, 326) **Class 4, Credit 4 (S)**
- 0875-350 Practicum and Seminar I**  
The student experiences a practicum placement under the immediate supervision of a professional interpreter who functions as the student's mentor, and the seminar instructor (supervision instructor). The practicum will involve such activities as observing the mentor and a variety of other interpreters at work; preparing videotapes for mentor critique; interpreting under the supervision of the mentor; and meeting weekly with the mentor to discuss the practicum experience. Additionally, practicum students will meet together weekly to share observations and experiences gained from the practicum placement. Class discussions focus on linguistic issues in interpretation, ethical dilemmas, situational concerns and problem solving. Students must complete this course with a grade of C or better. (Cumulative GPA 2.5; 0875-320, 325, 326 with grades of C or better) **Class 2, Credit 4 (F, W, S, Su)**

**0875-398** **Special Topics: ASL-English Interpreting**  
Credit variable (F, W, S)

**0875-399** **Independent Study: ASL-English Interpreting**  
Credit variable (F, W, S)

**0875-400** **Interactive Interpreting**  
In this course students advance their skills in interpreting alone and with team interpreters for interactive assignments within small group and one-to-one settings. Students will expand their understanding and use of ASL and English vocabularies related to content areas that are of current interest to Deaf and hard-of-hearing individuals locally and nationally. Students will also advance their interpreting analysis skills. (0875-325, 326) **Class 2, Lab 4, Credit 4 (S)**

**0875-411** **Interpreting Frozen and Literary Texts**  
This course will focus on skills and techniques for the interpretation of frozen texts in English and ASL. Work includes translation, transliteration and interpretation (between English and ASL) of source texts, including prayers, music, poetry, drama, etc. (0875-400) **Class 4, Credit 4 (offered annually)**

**0875-430** **Introduction to K-12 Interpreting**  
This course includes an overview of the history and current status of educational interpreting throughout the United States. Content includes the role, practices and skills of educational interpreters in K-12 settings; communication systems; pertinent laws and regulations; resources, information and strategies for consumer awareness and education; administrative practices and personnel structure of school systems; assessment and management of educational interpreters; and topics that concern educational interpreters. (0875-400) **Class 4, Credit 4 (S)**

**0875-501** **English to ASL Interpreting III**  
In this course students advance their skills in simultaneously producing equivalent ASL messages from spoken English source messages. Single-speaker texts on specific topic areas for large group settings will be the focus of this course. Students will continue to develop their English vocabulary, ASL vocabulary and interpreting analysis skills, and strengthen their team interpreting skills. Warm-up exercises will be performed as part of the self-care regimen recommended for sign language interpreters. To progress to Practicum and Seminar II (0875-510), students must complete course with a grade of C or better. (0875-400) **Class 4, Credit 4 (F)**

**0875-502** **ASL to English Interpreting III**  
In this course students advance their skills in simultaneously producing equivalent spoken English messages from ASL or contact language source messages. Single-speaker texts on specific topical areas for large group settings will be the focus of this course. Students will continue to develop their English vocabulary, ASL vocabulary, interpreting analysis skills, and strategies for team interpreting. To progress to Practicum and Seminar II (0875-510), students must complete course with a grade of C or better. (0875-400) **Class 4, Credit 4 (F)**

**0875-510** **Practicum and Seminar II**  
This course provides the student with experiential education under the supervision of a professional interpreter who functions as the student's mentor. The 10-week practicum consists of a minimum of 100 hours and will focus on gaining experience interpreting. The student may select a practicum placement in the post-secondary, K-12 or community setting. Additionally, students will meet two hours weekly in seminar, with other practicum students, to share observations and experiences gained from the practicum placement. Seminar discussions will focus on linguistic issues in interpretation, application of professional and business ethics, situational concerns and problem solving. The seminar instructor will be the practicum student's supervising instructor. Students must complete this course with a grade of C or better. (Cumulative GPA of 2.5 or better; 0875-501, 502 with grades of C or better) Field experience a minimum of 100 hours. **Class 2, Credit 4 (F, W, S, Su)**

**0875-515** **Interpreting Internship**  
This experience provides students with extensive exploration of the profession under the supervision of qualified, professional interpreters in one of several settings, including but not limited to education, medical, business and government. Internships will be available nationally at sites that provide high-quality supervised experiences. The internship will be 10 weeks in length, requiring approximately 35 hours per week. To satisfactorily complete this course the student must achieve a grade of C or better. (Cumulative GPA of 2.5; 0875-501 and 0875-502 with grades of C or better) Field experience 35 hours per week. **Credit 12 (W, S)**

**0875-520** **Issues in Interpreting**  
This course offers students an opportunity to integrate all curricular content areas through the examination and discussion of issues in the field of interpreting. While the course content and focus will vary depending on current issues and student interest/experiences, the course will provide an advanced experience of problem solving and value clarification. Students will develop and demonstrate their ability to define a research topic or problem, gather and evaluate scholarly evidence, and present their findings in a paper and presentation. (0875-501, 0875-502) **Class 4, Credit 4 (W, S)**

**0875-531** **Educational Interpreting: Elementary Settings**  
This course is designed to prepare students to interpret in elementary school settings. Content will include an orientation to activities, discipline content and sign vocabulary, language development, psycho-social development and interpreting issues that are pertinent to elementary students. The course addresses strategies for interpreting classroom discourse and various content areas. Vocabulary for various elementary content areas will be introduced. Students will do voice-to-sign and sign-to-voice interpreting for elementary-level texts. (0875-430) **Class 4, Credit 4 (W, S)**

**0875-532** **Educational Interpreting: Middle/Secondary Settings**  
This course is designed to prepare students to interpret in middle and secondary school settings. Content will include an orientation to activities, discipline content and vocabulary, language development, psycho-social development and interpreting issues that are pertinent to middle and secondary school students. The course addresses strategies for interpreting classroom discourse and content areas. Students will learn how to prepare the middle/secondary students to request and work with interpreters in community and post-secondary settings. Students will learn about interpreting for foreign language courses. Students will do voice-to-sign and sign-to-voice interpreting for middle- and secondary-school-level texts. (0875-430) **Class 4, Credit 4 (W, S)**

**0875-533** **Educational Interpreting: Post-Secondary Settings**  
This course prepares students to interpret in the post-secondary setting. Students will learn preparation strategies for voice-to-sign and sign-to-voice interpreting for the following topics: computer science, advanced science and mathematics, selected liberal arts, physical education and foreign language instruction. In addition, students will become familiar with current issues facing interpreters in post-secondary settings. As part of this course, students will observe interpreters working in several types of college classrooms (e.g., lectures, seminars, labs and studios). (0875-400) **Class 4, Credit 4 (W)**

## Accounting Technology

**0801-201** **Principles of Accounting I**  
Introduction to accounting for both accounting and nonaccounting students. Topics covered include the analyzing and recording of business transactions using the double-entry accounting system, end-of-period adjustments, the worksheet, financial statements, closing entries, the post-closing trial balance and the management of cash funds. Students complete a comprehensive "accounting cycle" project. Computerized spreadsheet applications are emphasized. **Class 6, Credit 4 (W, S)**

**0801-202** **Principles of Accounting II**  
A continuation of Principles of Accounting I for both accounting and nonaccounting students. Topics covered include the payroll system and accounting for a merchandising business using special journals. Course work includes a practice set that applies accounting concepts in a simulated business situation. Computerized spreadsheet applications are emphasized. (0801-201) **Class 6, Credit 4 (F, S)**

**0801-203** **Principles of Accounting III**  
This course is a continuation of Principles of Accounting I and II. Topics covered include the accounting principles and procedures related to notes payable and receivable, the valuation of receivables, inventories, fixed assets and partnerships. Computerized spreadsheet applications are emphasized. (0801-202) **Class 4, Credit 4 (F, W)**

**0801-204** **Principles of Accounting IV**  
This course emphasizes corporate accounting concepts and principles. Topics covered include capital stock, retained earnings, taxes, dividends, bonds, the statement of cash flow, and the analysis of financial statements. A comprehensive "annual report" team project is completed. Computerized spreadsheet applications are emphasized. (0801-203) **Class 4, Credit 4 (W, S)**



**0801-211** **Financial Accounting I**  
This course is the first in a series of two financial accounting courses for students in the associate of science in business degree program. Students develop problem solving, critical thinking and decision-making skills related to financial accounting concepts. Students gain an understanding of the mechanics and processes of the complete accounting cycle with an emphasis on the corporate form of business. Students learn generally accepted accounting principles and their impact on the preparation of financial statements. Skills in reading, understanding and analyzing published financial statements will be emphasized. **Class 4, Credit 4 (W)**

**0801-212** **Financial Accounting II**  
This course is the second in a series of two financial accounting courses for students in the associate of science in business degree program. Students develop problem-solving, critical-thinking and decision-making skills related to financial accounting concepts with an emphasis on the corporate form of business. Students gain an understanding of the accounting procedures related to current assets, inventories, long-term assets, current liabilities, long-term liabilities and the components of stockholder's equity. Students learn the procedures for preparing and the methods of analyzing the corporate income statement, statement of stockholder's equity, balance sheet and statement of cash flows. (0801-211) **Class 4, Credit 4 (S)**

**0801-221** **Managerial Accounting I**  
This course is the first in a series of two managerial accounting courses for students in the associate of science in business degree transfer program. Students develop problem-solving, critical-thinking and decision-making skills related to managerial accounting concepts. Students gain an understanding of the mechanics and processes of the complete accounting cycle with an emphasis on the manufacturing environment. Students learn generally accepted accounting principles and their impact on the preparation of financial statements. Skills in reading, understanding and analyzing financial reports will be emphasized (0801-212) **Class 4, Credit 4 (F)**

**0801-222** **Managerial Accounting II**  
This course is the second in a series of two managerial accounting courses for students in the associate of science in business degree transfer program. Students continue to develop problem-solving, critical-thinking and decision-making skills related to managerial accounting concepts. Students gain an understanding of the mechanics and processes of the complete accounting cycle with an emphasis on the manufacturing environment. Students continue to learn generally accepted accounting principles and their impact on the preparation of financial statements. Skills in reading, understanding and analyzing financial reports will be emphasized. (0801-221) **Class 4, Credit 4 (W)**

**0801-231** **Economics I**  
This two-course sequence gives an overview of micro- and macroeconomic concepts. Students examine economic problems in a rational manner by learning the fundamental processes of economic analysis and the skills of economic reasoning. These courses include selected knowledge and skills from the economic discipline presented in the form of concepts and understandings deemed most important to economic literacy for students. (Accounting technology associate degree status, 0804-101) **Class 4, Credit 3, (W)**

**0801-232** **Economics II**  
This two-course sequence gives an overview of micro- and macroeconomic concepts. Students examine economic problems in a rational manner by learning the fundamental processes of economic analysis and the skills of economic reasoning. These courses include selected knowledge and skills from the economic discipline presented in the form of concepts and understandings deemed most important to economic literacy for students. (Accounting technology associate degree status, 0804-101, 0801-231) **Class 4, Credit 3 (S)**

**0801-252** **Cost Accounting I**  
This course introduces students to cost accounting with an emphasis on job order costing. Topics covered include manufacturing statements; cost theory; and integration of materials, labor and overhead to the computerized job cost situation. Students complete a comprehensive practice set. Computerized spreadsheet applications are emphasized. (0801-203) **Class 6, Credit 4 (W)**

**0801-253** **Cost Accounting II**  
This course is a continuation of cost accounting, with particular concentration on process and managerial aspects. Topics covered include average and FIFO process costing methods, equivalent units, multiple products, changes in units, budgeting, cost classification and computerized applications. Students complete a comprehensive practice set. Computerized spreadsheet applications are emphasized. (0801-252) **Class 6, Credit 4 (S)**

**0801-260** **Applied Accounting Techniques**  
This course gives students an opportunity to reinforce and apply accounting topics and skills previously studied. Students work in a simulated accounting office as accounting clerks and perform a variety of general and process costing duties. Computerized spreadsheet applications are emphasized. (0801-252) **Lab 6, Credit 2 (F, S)**

**0801-299** **Co-op: Accounting Technology**  
Designed to give the student an opportunity to gain experience on the job, to apply what has been learned and to self-evaluate personal and communication skills. A job relating to the student's field of study could be taken near the student's hometown. Placement assistance is provided to help the student find a work experience job. One or two work experience sessions are required, depending on program of study. **Credit 0 (W, S, Su)**

**0801-398** **Special Topics - Accounting**  
**Credit variable (W)**

**0801-399** **Independent Study - Accounting**  
This course is offered on a quarterly basis to students who have special requirements not met in other accounting courses. This course is arranged on an individual basis and is flexible in design to meet individual needs. **Credit variable (F, W, S)**

## **Administrative Support Technology/ Business Technology**

**0804-101** **Orientation to Business**  
A broad overview of the form and structure of American business. It provides students with a basic knowledge of the history, organization and operation of business and its particular vocabulary. **Class 4, Credit 3 (F, S)**

**0804-110** **Business English**  
This course provides proofreading and editing skills as they relate to computer-generated business communications. Course content includes rules for word division, capitalization, numbers, abbreviation style, spelling, and business letter writing. Designed specifically for students enrolled in courses in the business studies department. **Class 3, Credit 3 (F, S)**

**0804-111** **Keyboarding**  
This course is for students with limited keyboarding experience and for those who keyboard below 25 net words per minute. Keyboarding focuses on skill development, introduction to the computer and basic formatting. Keyboarding students are expected to exit this course with a proficiency of 20 net words per minute for five minutes. **Class 1, Lab 3, Credit 2 (F, S)**

**0804-112** **OAS Formatting**  
This course is for students with little or no knowledge of word processing software, limited keyboarding experience, and a minimum of 20 net words per minute. Emphasis is on keyboarding skill development, introduction to the computer and basic word processing formatting skills. Students key and format business correspondence, reports and tables. The expectation is to exit this course with a proficiency of 25 net words per minute for five minutes. (0804-111) **Class 1, Lab 4, Credit 3 (F, W)**

**0804-113** **OAS Document Production I**  
This course focuses on enhancements to business correspondence, reports and tables produced on a microcomputer using word processing software. Skill development continues with an expected exit speed to 30 net words per minute for five minutes. **Class 3, Lab 2, Credit 4 (F, W, S)**

**0804-211** **Records Management and Business Calculation**  
This course develops basic skills in current business procedures related to general office functions. Skills include current records management applications, introductory database techniques and business calculation methods. Students develop skills applicable to a variety of office settings. **Class 5, Credit 3 (W, S)**

**0804-212** **Payroll/Spreadsheet Applications**  
This course develops basic skills in current business procedures related to general office functions. Students learn basic database and spreadsheet techniques. Students complete payroll records using both manual and computerized systems. Students develop skills applicable to a variety of office settings. **Class 5, Credit 3 (F, W)**

**0804-221** **OAS Document Production II**  
Emphasis on the improvement of basic skills and their application to a variety of realistic office projects. Students type correspondence, reports and tables on a microcomputer using current software. Students are expected to exit with a net speed of 40 words per minute for five minutes. (0804-113) **Class 3, Lab 2, Credit 4 (F, W, S)**

**0804-230** **Administrative Support Technology Seminar**  
This course provides students with an opportunity to prepare for employment through team presentation, mentoring and guest lectures. Topics for discussion are identified by students enrolled in the seminar. Topics covered may include time management, career development and personal/social development skills necessary for job success. Students are expected to participate in planning class sessions. **Class 4, Credit 3 (S)**

**0804-284** **Fundamentals of Management**  
Focuses on theory and practice basic to the management process. Students use case studies, lectures and simulations to study planning, organizing, directing, staffing and controlling functions. Also introduces students to motivation and leadership theory as it relates to the role of a manager. (0804-101) **Class 4, Credit 3 (F, W)**

**0804-286** **Fundamentals of Marketing I**  
Introduction to the field of marketing and its strategies. Topics include consumer behavior and its effect in the marketplace, product research and planning, pricing, distribution channels, marketing institutions, advertising and promotion and organization. (0804-101) **Class 4, Credit 3 (W, S)**

**0804-290** **Small Business Organization**  
This is an elective course designed for the business student but available to a student from another technical major who has completed the prerequisites and who has a desire to learn entrepreneurial skills to allow starting a business. Each student will develop a business plan. **Class 4, Credit 3 (S)**

**0804-291** **Applied Business Techniques**  
Gives students an opportunity to review skill-oriented course work on a microcomputer prior to graduation and job entry. Skill review includes production and speed typing, payroll procedures, records management techniques, word processing and database applications using current software packages. (0804-302) **Class 4, Credit 2 (F, W, S)**

**0804-299** **Co-op: Administrative Support Technology/  
Business Technology**  
**Credit 0 (Su)**

**0804-302** **Advanced Applications for Word Processing**  
This course provides an introduction to advanced document formatting and applications using various types of word processing, spreadsheets, databases, slide presentations and electronic office procedures. Students learn new skills using current software on a PC. (0804-221) **Class 4, Credit 4 (F, W, S)**

**0804-303** **Business Graphics**  
This self-paced course provides a continuation of the word processing concepts and applications presented in the previous course. Students use current software on a PC to create basic business and data-driven graphics that are prepared in the office environment. An introduction to desktop publishing basics also is included. (0804-302) **Class 4, Credit 4 (W, S)**

**0804-304** **Database Applications for Business**  
This course contains the concepts and applications for creating, maintaining, retrieving and printing files. Using current database software on PC equipment, students use files to create various forms and reports. (0804-302) **Class 4, Credit 4 (F, W, S)**

**0804-310** **Desktop Publishing for Business**  
This course for students in the administrative support technology program provides further study in the field of desktop publishing, utilizing word processing and microcomputer equipment. Students create documents that contain business graphics, clip art and self-created graphics. Current software programs are used and provide a working knowledge of microcomputer-based desktop publishing. In addition to required projects, students select and design documents of their choice. (0804-303) **Class 4, Credit 3 (F, S)**

**0804-312** **International Dimensions of Business**  
This course will increase students' awareness about international developments impacting the American work force and market conditions and the impact of the global marketplace relating to their future employment in an American or foreign owned business. **Class 4, Credit 3 (S)**

**0804-315** **Preparation for MOS Certification - Word**  
This course is intended to prepare students to take the Microsoft Office Specialist exam for Microsoft Word, Core Level. The exam tests proficiency through hands-on assessment in simulated Microsoft Office Word applications. Skill sets include: creating content, organizing content, formatting content, collaborating, formatting and managing documents. (0804-221) **Class 2, Credit 1 (F, W, S)**

**0804-316** **Preparation for MOS Certification - PowerPoint**  
This course is intended to prepare students to take the Microsoft Office Specialist exam for Microsoft PowerPoint. The exam tests proficiency through hands-on assessment in simulated Microsoft Office Excel applications. Skill sets include: creating content, formatting content, collaborating, managing and delivering presentation. (0804-303) **Class 2, Credit 1 (F, W, S)**

**0804-317** **Preparation for MOS Certification - Excel**  
This course is intended to prepare students to take the Microsoft Office Specialist exam for Microsoft Excel, Core Level. The exam tests proficiency through hands-on assessment in simulated Microsoft Office Excel applications. Skill sets include: creating data and content, analyzing data, formatting data and content, collaborating, managing workbooks. (0804-212) **Class 2, Credit 1 (F, W, S)**

**0804-318** **Preparation for MOS Certification - Access**  
This course is intended to prepare students to take the Microsoft Office Specialist exam for Microsoft Access. The exam tests proficiency through hands-on assessment in simulated Microsoft Office Access applications. Skill sets include: structuring databases, entering data, organizing data, and managing databases. (0804-304) **Class 2, Credit 1 (F, W, S)**

**0804-398** **Special Topics – Administrative Support Technology/  
Business Technology**  
**Credit variable**

**0804-399** **Independent Study – Administrative Support Technology/  
Business Technology**  
**Credit variable**

## American Sign Language

These courses satisfy the humanities distribution requirement. C-level courses satisfy the AOS requirement. These courses may also satisfy the deaf studies/American Sign Language requirement as noted.

### **Fundamental (Level B)**

**0886-150** **Introduction to American Sign Language\*†**  
Introduces knowledge about American Sign Language (ASL), provides a basic understanding of ASL and discusses principles of sign formation. The course also compares aspects of different visual communication modalities and spoken language. Strategies for learning ASL will be discussed. **Class 3, Credit 3 (F)**

**0886-199** **American Sign Language I\*†**  
Designed for students who have no previous knowledge of American Sign Language. ASL I includes the linguistic features, cultural protocols and core vocabulary for students to function in basic ASL conversations that include ASL grammar for asking and answering questions while introducing oneself; exchanging personal information; talking about family, friends and surroundings; and discussing activities. Classroom and lab activities include practicing conversations and videotaping. (SIP1/LCBQ:1) **Class 4, Credit 4 (F, W)**

### **Intermediate (Level C)**

**0886-200** **American Sign Language II\*†**  
Expands the basic principles presented in ASL I. The course teaches students to use linguistic features, cultural protocols and core vocabulary to function in additional basic ASL conversations, including ASL grammar for giving directions; describing others; making requests; talking about family, occupations and routines; and attributing qualities to others. Classroom and lab activities include practicing conversations and videotaping. (0886-199 or equivalent) **Class 4, Credit 4 (F, W, S)**

\*This course satisfies the deaf studies/American Sign Language requirement.

†This course satisfies the humanities requirement.

**0886-201** **American Sign Language III\*†**  
This course is a continuation of ASL II expanding the emphasis on ASL grammar, syntax, spatial referencing and vocabulary development. ASL III teaches further communicative competencies in ASL conversations beyond the basic level that include telling life events, describing events in time, asking for clarification, correcting, conforming, elaborating on information, agreeing and disagreeing, resolving conflicts and giving directions. Classroom and lab activities include practicing dialogues, short stories, narratives and short conversations. (0886-200 or equivalent) **Class 4, Credit 4 (F, W, S)**

### **Bridging (Level D)**

**0886-249** **Structure of American Sign Language\*†**  
Provides students with basic knowledge about the linguistic structure of American Sign Language (ASL). Through an introduction to language components, students examine the phonology, morphology and syntax of ASL. Information regarding historical and cultural aspects of ASL is also introduced and discussed. This course is taught in ASL. **Class 3, Credit 3 (F, W, S)**

**0886-250** **Introduction to ASL Teaching\*†**  
Provides overview of how second languages have traditionally been taught, what the current methods and theories are, and their applications to the teaching of sign language. Students are provided opportunities to practice basic teaching techniques, select appropriate materials, learn basic curriculum design and evaluation techniques, including how to teach cultural and grammatical features in lessons. Students learn about resources to support their efforts to teach sign language. **Class 3, Credit 3 (W, S)**

## **Applied Computer Technology**

**0805-201** **Applications Software**  
This course is an introduction to computers and problem solving using general-purpose application software. Students solve a variety of problems by using application software tools such as a word processor, a spreadsheet, a presentation package and a database program. **Class 3, Credit 3 (F, W, S)**

**0805-212** **Applied Circuits I**  
A first course in circuits that introduces students to the fundamentals of direct current (DC) and alternating current (AC) electricity. Students become familiar with fundamental concepts of conductivity, resistivity, laws of attraction and associated engineering notation and prefixes. Topics covered include power, energy transfer, open- and short-circuit diagnosis. Through hands-on laboratory projects, students will acquire an understanding of fundamental DC and AC, voltage and resistance and will develop skills for connecting and measuring series and parallel DC and AC circuits. Digital multimeters (DMMs) are used to measure and troubleshoot breadboard circuits. **Class 3, Lab 2, Credit 4 (F, W)**

**0805-213** **Applied Circuits II**  
A second course in circuits where students continue to study concepts of electricity as they relate to direct current (DC) and alternating current (AC) circuits, including power, energy transfer, open- and short-circuit diagnosis. Topics include series and parallel circuits, resistance, capacitance, impedance, inductance, conductance, DC/AC power and transformers. Through hands-on laboratory projects, students will acquire an understanding of AC/DC current, voltage and resistance; build skills in connecting and measuring series, parallel and series-parallel circuits. Oscilloscopes and DMMs will be used to measure and troubleshoot breadboard circuits. (0805-212) **Class 2, Lab 2, Credit 3 (W, S)**

**0805-215** **PC Operating Systems**  
This course is designed to acquaint students with the structure and function of microcomputing operating systems and to provide the skills required to install, configure and maintain them. Topics include system concepts, system-level commands and commands relating to program, file and applications management. Students perform a variety of functions, including OS installation and configuration, application program installation and management, creation and management of directories and file structures, partitioning and preparation of storage media. (0805-216) **Class 2, Lab 2 Credit 3 (S, F)**

**0805-216** **PC Hardware I**  
This course introduces the fundamental hardware concepts of IBM-compatible personal computer (PC) systems, including their structure and components. The skills required to install, upgrade and maintain PCs are presented. Hands-on topics include the identification and handling of basic computer hardware, input/output devices and data communications. Various methods of upgrading microcomputers are presented. **Class 2, Lab 2, Credit 3 (F, W)**

**0805-217** **PC Hardware II**  
This course provides students with methodologies and hands-on activities related to the configuration, diagnosis, repairing, and preventive maintenance of microcomputers. Topics include familiarization with the basic functions and use of test equipment, logical troubleshooting of internal system conflicts and faulty peripherals, electrical safety, and methods of maintaining computer equipment. (0805-216) **Class 2, Lab 2, Credit 3 (W, S)**

**0805-220** **Introduction to UNIX**  
This course is designed to address the basics of the UNIX computer operating system. Salient features of mainstreamed operating systems covered in PC operating systems and other systems are reviewed in this course and compared with similar UNIX functions to illustrate efficiencies of various operating systems. Topics include language commands; mail; network communications; directory and file structure; the editor; shell, pipe and filter concepts. (0805-201) **Class 3, Credit 3 (F, S)**

**0805-224** **Introduction to Networking and Security**  
This first course focuses on stand-alone local area networks (LANs) of microcomputers. Students study network configurations, cabling, physical layer protocols, and network operating systems. Students add computer equipment to a LAN, install software and identify and correct hardware and software incompatibility problems. **Class 2, Lab 2, Credit 3 (F, W)**

**0805-225** **Networking Essentials**  
This second course in networking builds on concepts learned in Introduction to Networking and Security. Topics focus on connecting local area networks (LANs) of personal computers with other LANs, wide area networks (WANs) and minicomputer/mainframe computers. (0805-224) **Class 2, Lab 2, Credit 3 (W, S)**

**0805-226** **Client/Server Networks**  
This third course is designed to provide students with skills in implementing and maintaining the network infrastructure required to support intranets/internet. Topics include implementing and administering internet/intranet services of the appropriate server platform, applications, WAN technologies, security, reliability and coordination with content providers. There is heavy emphasis on hands-on problem solving. (0805-225) **Class 2, Lab 2, Credit 3 (F, S)**

**0805-230** **Introduction to Programming**  
A first course in programming that introduces students to general programming concepts and enables them to design simple Windows-based business applications. Course focus is on problem-solving methods, design and writing of simple Windows-based applications with an emphasis on logic skill development. The course serves as a foundation for future programming courses. Programming projects are required. (0805-215) **Class 3, Credit 3 (F, W)**

**0805-231** **Programming II**  
A second course in programming where students learn to write modular, well-documented programs and are introduced to computer programming constructs. Course focus is on problem analysis, design and writing of typical Windows-based business applications with emphasis on logic skill development. Programming projects are required. (0805-230) **Class 3, Credit 3 (W, S)**

**0805-240** **Fundamentals of Digital Logic**  
This course introduces the fundamentals of digital logic, devices and circuits. Topics include binary arithmetic, truth tables, Boolean algebra, logic gates, counter, flip-flops, multiplexers and decoders. Common digital decoders will be used to drive LED and LCD displays. Troubleshooting procedures will be studied, including static and dynamic tests. Digital multimeters (DMMs) are used to measure and troubleshoot breadboard circuits. (0805-212) **Class 2, Lab 2, Credit 3 (W, S)**

\*This course satisfies the deaf studies/American Sign Language requirement.  
†This course satisfies the humanities requirement.

- 0805-245** **Fundamentals of Electronics**  
This course covers the fundamentals of electronic components and circuits, including diodes, rectifier circuits, bipolar transistor switches, SCRs, op amps and power supplies. Various types of field effect transistors, IC operational amplifiers and their applications will be studied. Laboratory equipment such as oscilloscopes, digital multimeters (DMMs) and power supplies will be used for measuring devices and circuits. (0805-213, 212 for automation technologies program) **Class 2, Lab 2, Credit 3 (F, S)**
- 0805-251** **Web Development I**  
This course addresses the basics of the Internet, including introduction to the Internet, Web browsers, searching/researching on the Internet, creating and maintaining home pages with page/site creation applications, multimedia on the Web and introductory-level Web programming. (0805-201) **Class 3, Credit 3 (W, S)**
- 0805-252** **Web Development II**  
This course continues Internet Technologies I by addressing intermediate topics for the World Wide Web: using hypertext programming and scripting languages to enhance Web pages, creating links between home pages and databases maintained outside of the Web, and creating advanced multimedia for the Web (for example, image maps, animations, audio and movies/video). (0805-251) **Class 3, Credit 3 (F, S)**
- 0805-298** **General Work Experience**  
This course serves as an introduction to work experience. Students are expected to seek supervised employment to apply skills that promote desirable work habits, effective communication, awareness of employer expectations and the ability to make cooperative and productive interpersonal choices. This work experience need not be related to the student's technical educational goals. **Credit 0 (F, W, S, Su)**
- 0805-299** **Co-op: Applied Computer Technology**  
**Credit 0 (F, W, S, Su)**
- 0805-301** **C++ Programming I**  
The first course in a two-quarter sequence in C++ programming. Topics include elementary data types, C++ control structures, arrays, records, functions with parameters and introductory object-oriented programming concepts. (0805-230) **Class 4, Credit 4 (W, S)**
- 0805-302** **C++ Programming II**  
Second in a two-quarter course sequence in C++ programming. Topics include additional information on data types, C++ control structures, arrays, records, functions with parameters and introductory object-oriented programming concepts. This sequence is intended to give students beginning skills in C++ programming. (0805-301) **Class 4, Credit 4 (F, W)**
- 0805-305** **Spreadsheet Software**  
This course provides students with an in-depth study of spreadsheets and how they are used as a productive tool in business. Students are given hands-on instruction on how to create and manipulate spreadsheets to solve common business problems and how to use the built-in language found in spreadsheet software to automate the solution to a variety of spreadsheet problems. (0805-201, 230) **Class 3, Credit 3 (F, S)**
- 0805-310** **Microcomputer Database Software**  
Creating, inquiring, reporting and other functions of databases. A leading database software product for microcomputers is studied. Students design a database, establish criteria for data to be accepted and coded, and prepare views of the database contents. Database utilization in the business environment and application to the student's expected work environment is presented. (0805-201, 230) **Class 3, Credit 3 (F, W)**
- 0805-315** **Introduction to Desktop Publishing**  
Provides a hands-on introduction to the use of desktop publishing software on computer platforms. The mechanics of the use of software products to create and integrate text and graphics is presented. Technical topics, including file formats and file exchange, are stressed over design considerations. (0805-251) **Class 3, Credit 3 (W, S)**
- 0805-320** **Client-Side Scripting**  
The course is an introduction to client-side programming for the Internet using a common scripting language. Students will be introduced to the syntax of the scripting language and then learn to build practical and interactive client-side applications. (0805-252, 0805-231) **Class 2, Lab 2, Credit 3 (W)**
- 0805-321** **Database Integration**  
This course is an introduction to integrating relational databases with the World Wide Web. Students will learn to form basic database queries and then create interactive Web pages that combine queries with current server technologies to create dynamic, data-driven Web sites. (0805-252, 310) **Class 2, Lab 2, Credit 3 (W)**
- 0805-322** **Web Server Technologies**  
This course is an introduction to server-side technologies for the Web. Students will be introduced to the principles and details of how a Web server works as well as issues related to Web server installation, performance and security. The role of server-side scripts and CGI's will also be studied, and students will get experience modifying scripts to solve user specifications. (0805-226, 320) **Class 2, Lab 2, Credit 3 (S)**
- 0805-323** **Advanced Web Development**  
This is a capstone course bringing together the skills learned in all previous Web development courses to create a single large-scale Web project. Students will first be introduced to the newest trends in Web technology, currently XML, so that they are on the cutting edge of the technology they will encounter in the workplace. Skills in Web programming and scripting, database applications, Web development tools and Web graphics will then be brought together to solve a Web-based problem by creating a large-scale Web project. (0805-320, 321; corequisite 0805-322) **Class 2, Lab 3, Credit 3 (S)**
- 0805-330** **Microprocessor**  
This course is designed to provide a hands-on introduction to microprocessors. Students will learn how to control microprocessors using assembly language to control importing and exporting of data to and from external devices through the I/O ports of a computer and to control the operation of a microprocessor. Programming assignments will be required. (0805-230, 240) **Class 2, Lab 2, Credit 3 (F, S)**
- 0805-335** **LAN/WAN Design**  
This course is designed to provide a hands-on introduction to multi-protocol routers and multi-switched networks. The class will include basic router operations, architecture and configuration; switched Ethernet networks; virtual LAN technology; configuration of switching devices; and troubleshooting. Students will set up, wire and configure expansion technologies in an Internet work environment. (0805-226) **Class 2, Lab 3, Credit 3 (W)**
- 0805-336** **Network Security**  
This course will provide students with a deeper understanding of computer and data network security. Students will examine an infrastructure design process for securing computer systems and data networks as well as methodologies and best practices for implementing security, security policies, security testing and incident response. The underlying principles used to secure networks, including security technologies, intrusion detection, authentication and cryptography basics will be discussed. This course will also introduce students to network security planning, technology and organization, and the legal and ethical issues associated with network security. (0805-226) **Class 2, Lab 3, Credit 3 (W)**
- 0805-337** **Server Management and Security**  
The course is an introduction to server management. Students taking the course will learn to implement and administer network servers by managing server devices, file system, users and groups and application software. Students will also learn how to monitor and fine-tune server security and performance and to implement backup and fault tolerance. (0805-226) **Class 2, Lab 3, Credit 3 (S)**
- 0805-338** **Firewalls and IDS**  
This course will provide students with a deeper understanding of the various methodologies used by firewalls and IDS for defending a network from security attacks. Students will be introduced to the concepts, principles, types and topologies of firewalls to include packet filtering, proxy firewalls, application gateways, circuit gateways and stateful inspection. Various defense methodologies associated with virtual private networks (VPN), host intrusion detection systems (HIDS) and network intrusion detection systems (NIDS) will also be covered. Students will learn best practices associated with properly securing business-critical network systems using VPNs with counter-measurement tools and techniques. (0805-336) **Class 2, Lab 3, Credit 3 (S)**

**0805-340** **Visual Programming Language I**  
This is the first course of a two-quarter sequence in visual programming language (VPL). Topics include pick and drop data controls, module and variable declarations, property boxes, form design windows, code design windows, event generators and introductory visual object-oriented programming concepts. This course is intended to give students beginning skills in graphical user interface (GUI) programming. (0805-230) **Class 4, Credit 4 (W, S)**

**0805-341** **Visual Programming Language II**  
This is the second course of a two-quarter sequence in visual programming language (VPL). This course covers advanced topics such as error handling, client/server applications, procedure calls, functions and application program interfaces (APIs), OLE, multiple document interfaces and dynamic linked libraries. The two-course sequence is intended to give students an in-depth background in developing GUI client/server applications and basic technical writing in the form of online help screens. (0805-340) **Class 4, Credit 4 (F, S)**

**0805-350** **Computer Interfacing**  
This course provides a deeper understanding of software/hardware electronics interfacing theory and applications. Topics include fundamental understanding of DC and AC electricity and how it applies to computers and their peripherals. Software/hardware program interfacing and testing of general real-world applications such as computer telephony, video/voice communications and the interconnection of digital devices are also included. Students become familiar with electronic test equipment such as digital multimeters (DMMs), oscilloscopes and such, and how they are used in the laboratory to diagnose hardware and software problems. (0805-217, 230) **Class 2, Lab 3, Credit 3 (S)**

**0805-351** **Introduction to the Macintosh**  
This course is designed to equip students with general competency and familiarity with the Macintosh platform. Designed primarily for PC/Windows users, previous and current Mac operating systems will be thoroughly reviewed. Macintosh applications, hardware, networking and troubleshooting will also be covered. (0805-215, 226) **Class 2, Lab 2, Credit 3 (W)**

**0805-355** **Industrial Controls**  
This course will familiarize the student with various industrial controls and devices used in a manufacturing environment. The most commonly used DC and AC motors and servos will be studied. Motor controls, containing commonly used sensors, vision and feedback systems will be studied. Programmable logic controllers will be studied from both a hardware and software perspective. (0805-245) **Class 2, Lab 2, Credit 3 (F, W)**

**0805-370** **Fiber Optic Cable: Uses and Maintenance**  
This course introduces fiber optics and parallels the objectives of the National Association of Communication Contractors fiber optic cable installer training. Students will learn the basic fiber systems, which consist of a light-emitting diode or laser transmitter, fiber optic cable, connectors and a receiver. The course is primarily oriented to connectorization of cable ends and their evaluation using the optical time domain reflectometer (OTDR). (0805-224) **Class 2, Lab 2, Credit 3 (W, S)**

**0805-375** **Telecommunication Concepts**  
This course introduces concepts in both analog (voice) and digital (data) telecommunications. Topics covered include plain old telephone service (POTS), in-home wiring service, telephone operation, number coding, routing, transmission media and other appropriate telephony topics. Private branch exchanges (PBX) and Centrex also will be discussed. (0805-225) **Class 2, Lab 2, Credit 3 (S)**

**0805-380** **A+ Core Hardware Certification Preparation**  
The course will prepare students to take and pass the CompTIA's A+ Core Hardware certification exam. Students will review material from previous courses and complete practice exams and troubleshooting exercises in preparation for the exam. In addition to textbook(s), students will be required to purchase a certification exam voucher for this course. Students must pass the certification exam to pass the course. (0805-215, 226) **Class 1, Lab 2, Credit 2 (F)**

**0805-381** **A+ OS Technologies Certification Preparation**  
The course will prepare students to take and pass the CompTIA's A+ Operating Systems Technologies certification exam. Students will review material from previous courses and complete practice exams and troubleshooting exercises in preparation for the exam. In addition to textbook(s), students will be required to purchase a certification exam voucher for this course. Students must pass the certification exam to pass the course. (0805-215) **Class 1, Lab 2, Credit 2 (W)**

**0805-382** **Network+ Certification Preparation**  
The course will prepare students to take and pass the CompTIA's Network+ certification exam. Students will review material from previous courses and complete practice exams and troubleshooting exercises in preparation for the exam. In addition to textbook(s), students will be required to purchase a certification exam voucher for this course. Students must pass the certification exam to pass the course. (0805-335) **Class 1, Lab 2, Credit 2 (S)**

**0805-383** **Security+ Certification Preparation**  
The course will prepare students to take and pass the CompTIA's Security+ certification exam. Students will review material from previous courses and complete practice exams and troubleshooting exercises in preparation for the exam. In addition to textbook(s), students will be required to purchase a certification exam voucher for this course. Students must pass the certification exam to pass the course. (0805-336) **Class 1, Lab 2, Credit 2 (S)**

**0805-384** **CIW Foundations Certification Preparation**  
This course will prepare students to take and pass the CIW Foundations certification exam. Students will review material from previous courses and complete practice exams and troubleshooting exercises in preparation for the exam. In addition to textbook(s), students will be required to purchase a certification exam voucher for this course. Students must pass the certification exam to pass the course. (0805-226, 320) **Class 1, Lab 2, Credit 2 (S)**

**0805-390** **Programming Fundamentals**  
This pre-programming course is for students pursuing a major in the Golisano College of Computing and Information Sciences (GCCIS) and is designed to help them develop the programming, logic and problem-solving skills needed for success in the GCCIS majors. This course will provide students with a study of the fundamental concepts, logical structures and algorithms inherent to computer programming. Students will learn how to write basic object-oriented programs in a contemporary programming language. (0502-111, 1016-204 or 0884-275) **Class 3, Lab 2, Credit 4 (F, S)**

**0805-398** **Special Topics: Applied Computer Technology**  
**Credit variable (F, W, S)**

**0805-399** **Independent Study: Applied Computer Technology**  
**Credit variable (F)**

## Applied Optical Technology

**0827-105** **Introduction to Optical Technology I**  
A sampling of optical finishing technology, including an overview of the career, admissions and graduate requirements; sources of employment; and expectations of students in the program. Students learn the titles, roles and responsibilities of vision-care personnel, including the M.D., O.D., dispensing optician and optical finishing technologist. **Class 2, Credit 2 (F)**

**0827-106** **Introduction to Optical Technology II**  
The function and use of optical laboratory equipment necessary to the production of single-vision eye wear. Students learn the basic concepts of sphere, cylinder, axis and geometric center. **Class 2, Credit 2 (W)**

**0827-107** **Introduction to Optical Technology III**  
Introduces the concept of writing functions of given vertometer parts. Students learn the process of writing step-by-step sequential procedures for equipment operation. They practice determining lens powers from vertometer readings and calculating decentration from given prescription information. They also learn the meanings of various optical terms found on prescription forms. (0827-106 or permission of department) **Class 2, Credit 2 (S)**

**0827-111** **Optical Math I**  
This course focuses on the rules of transposition, including transposition of lens powers. Students learn to apply mathematic functions, solving for binocular and monocular P.D.s, near-vision prescriptions and bifocal segment height and inset. The concepts of plus and minus cylinder prescription powers are discussed, and definitions and determinations of lens powers from given base curves, cross curves and inside curves are taught. (0884-180) **Class 4, Credit 3 (F)**

**0827-112** **Optical Math II**  
Students learn how to select and determine appropriate base curves, cross curves and inside curves of given lens powers. Students learn mathematical formulas used in determining effective diameter, smallest lens blank and prism. They also learn to apply mathematic functions related to vertometer power readings, heat treat times and lens gauge readings. (0884-180, 0827-111) **Class 4, Credit 3 (W)**

- 0827-115** **Prescription Analysis**  
Teaches students the meaning of various optical terms found on prescription forms. Students learn what information should be on a complete prescription and how to analyze single-vision and multifocal prescriptions for laboratory processing. **Class 4, Credit 3 (F)**
- 0827-117** **Lens Design**  
Teaches students how to design lens systems based on specific optical factors such as frame selection, lens material, lens thickness, index of refraction, size of lens, lens power, blank manufacturer and cosmetic appeal. Students learn trade names of lenses, percentages of lens transmission, multifocal segment placement, and occupational and recreational lens forms. (0827-111, 112) **Class 5, Credit 3 (S)**
- 0827-161** **Optical Terminology I**  
Emphasizes comprehension, spelling and application of terminology related to the optical profession, including the laboratory environment, function and disorders of the eye, and optics/lens characteristics. **Class 5, Credit 3 (F, W, S)**
- 0827-162** **Optical Terminology II**  
Emphasizes the comprehension, spelling and application of terminology related to the vertometer, lensometer, pattern maker, heat treat units, and ceramic and diamond-head beveling wheels. (0827-161) **Class 5, Credit 3 (F, W, S)**
- 0827-200** **Optical Processes I**  
Teaches students basic techniques of using the vertometer to analyze single-vision lenses, layout marker, heat treat units, and pattern maker, automatic edging machines and development of hand-beveling skills. (0885-200 or 0885-201) **Class 1, Lab 6, Credit 4 (S)**
- 0827-201** **Optical Processes II**  
Teaches students the theory and techniques of centering, power verification and spotting of single-vision and selected multifocal lenses. Students are taught the mechanics of lens centration using layout markers and lens edging using a variety of edging systems. The concepts and techniques of vee-beveling, rimless bevels, and hide-a-bevel are emphasized. (0827-200) **Class 1, Lab 6, Credit 4 (S)**
- 0827-202** **Optical Processes III**  
Emphasis is on individual fabrication of given prescriptions. Students are given a variety of single-vision and multifocal prescriptions to be completed during the quarter. Finished prescriptions are evaluated using ANSI standards. (0827-201) **Class 9, Credit 5 (S)**
- 0827-210** **Fundamentals of Photonics**  
This course provides a general introduction to the nature of light. Course emphasis is on the properties of light; interaction of light in various materials; how laser light is generated, controlled and detected and the role of light in human vision. (0885-200 or 0885-201) **Class 3, Credit 3 (F)**
- 0827-217** **Lens Design and Applications**  
Teaches students how to design lens systems based on specific optical factors such as lens material, lens thickness, index of refraction, lens size, lens power, blank manufacturer and cosmetic appeal. Students learn trade names of lenses; percentages of light transmission; color dispersion and abbe value; multifocal segment placement; and industrial, occupational and recreational lens forms. **Lab 2, Class 2, Credit 3 (W)**
- 0827-220** **Optics of Imaging and Design**  
This course focuses on the basic concepts related to image formation and image characteristics. Students perform basic calculations using the lens equation to determine image size and position. Students learn about various image forming optical systems and their use in today's society. **Class 3, Credit 3 (S)**
- 0827-225** **Optical Laboratory Simulation I**  
Provides practice in the total processing of actual eyeglass prescriptions from uncut stage through completion and final inspection. Students practice assembling lenses into frames and symmetrical alignment of the finished product. Students assume the duties of supervisors and rotate positions to demonstrate competence in all phases of operation. **Class 9, Credit 5 (W)**
- 0827-226** **Optical Laboratory Simulation II**  
Teaches the techniques of rimless mounting, drilling, grooving, frame repair (soldering), lens dyeing and the use of the spectrometer. Students select frame and lenses for layout and processing to finished product. (0827-225) **Class 9, Credit 5 (S)**
- 0827-235** **Fundamentals of Optical Testing**  
In this course students learn basic techniques used for testing spherical surfaces, flats and prisms. Topics include measurement of surface quality, focal length, power, basic interferometry and aberrations. Specific measuring techniques include autocollimation, laser two-beam, spherometer, saggital gauge, nodal slide bench, Fizeau interferometer, test plates and surface profilers. (0813-255 and 0885-200 or 0885-201) **Class 1, Lab 4, Credits 3 (F)**
- 0827-237** **Optical Testing**  
This course is a continuation of the skill set development introduced in Fundamentals of Optical Testing. Students expand their knowledge of techniques used for testing spherical surfaces, flats and prisms. Topics include basic interferometry, fringe analysis, angle of deviation, refractive index, abbe value and aberrations. Specific measuring techniques and instruments include autocollimation, laser two-beam, spherometer, spectrometer, saggital gauge, nodal slide bench, interferometer, Ronchi testing, test plates and surface profilers. (0827-235) **Class 1, Lab 4, Credit 3 (W)**
- 0827-240** **Precision Optics Manufacturing I**  
In this course students learn and apply basic optical principles used in conventional manufacturing of precision optical elements. Procedures and techniques include blocking, rough bench grinding, double-sided lapping/grinding, polishing, deblocking and centering. Students practice and apply appropriate handling and visual inspection techniques. (0813-255 and 0885-200 or 0885-201) **Class 1, Lab 4, Credit 3 (S)**
- 0827-245** **Precision Optics Manufacturing II**  
This course is the second in a sequence of courses in which students learn to apply basic principles used in conventional and CNC manufacturing of precision optical elements. The emphasis in this course will be on the production of simple convex and concave spherical elements. Procedures and techniques include curve generating, blocking, rough and fine grinding, stick polishing, deblocking and centering. Students practice and apply appropriate handling and visual inspection techniques. (0827-240) **Class 1, Lab 4, Credit 3 (F)**
- 0827-251** **Optical Technology Seminar**  
Students learn how attitude, aptitude and personal/social factors contribute to successful employment. Students also receive instruction regarding such topics as the Americans with Disabilities Act (ADA), effective person-to-person interviewing, interviewing using telecommunications techniques, corporate culture, and the American Board of Opticianry Testing. **Class 2, Credit 2 (W)**
- 0827-270** **Orientation to Lens Surfacing**  
This course is an overview of the basic concepts and procedures needed to produce prescription lenses. Students are introduced to the basic operation of the surfacing layout marker, lens blocking system, surface curve generator and fining/polishing machine(s). Students will also learn terminology and techniques to assess the quality of finished lens surfaces. **Class 2, Lab 2, Credit 3 (F)**
- 0827-280** **Applications of Lens Surfacing**  
In this course, students continue to learn and expand on skills introduced in Orientation to Lens Surfacing. Students are introduced to the process of producing lens power through the procedures of lens surfacing. Emphasis is on the advanced operation of the lens layout marker, lens blocking system, surface curve generator and cylinder machine(s). Students will learn terminology and techniques used to assess lens surfaces (0827-270) **Class 2, Lab 4, Credit 4 (F)**
- 0827-299** **Co-op: Applied Optical Technology**  
This course provides a 10-week experience in the optical field. Co-op provides students with an opportunity to apply and expand skill sets acquired in the classroom. (0827-101) **Credit 0 (F, W, S, Su)**
- 0827-399** **Independent Study - Applied Optical Technology**  
**Credit variable (F, W, S)**

# Art and Computer Design

0825-105

## Visual Idea Development

Gives students the opportunity to tap a multitude of resources, including personal experience and the environment, as aids to creativity through a variety of activities, including classroom discussions, field trips, guest lectures, written journals and sketchbooks. Students learn strategies for developing concepts and organization of thought processes as well as systems to formulate solutions to design problems. The library is used for development of research skills. **Class 2, Credit 2 (F, W)**

0825-109

## Concepts of Computer Graphics

Students are introduced to the basics of computer graphic technology through the use of lectures, demonstrations, hands-on experiences, assigned reading, required notetaking, written vocabulary and written tests. Hardware, software, desktop environment, input devices, storage/media, file types, operating system(s), file management, copyright/ legal issues, health/safety and technical vocabulary are covered. Emphasis is on comprehension and correct usage of terminology/vocabulary and concepts. **Class 1, Credit 1 (F, W)**

0825-110

## Bit-Map Graphics

Students learn skills related to bit-mapped illustration programs to create color images using various functions of the programs, such as the pencil, brush, airbrush, rubber stamp, selection tools, basic layer controls and image correction and enhancement. Fundamentals of color, including using color library and color controls are taught. Comprehension and correct use of terminology/vocabulary and concepts are emphasized. **Studio 4, Credit 2 (F, W)**

0825-204

## Perspective Drawing

Introduction to the fundamentals of perspective, including one-point, two-point, three-point perspective; special vanishing points; mixed perspective; and ellipses. Basic three-dimensional shapes will be drawn using both freehand techniques and drafting tools. Perspective concepts are applied to drawing more complex objects and environments, including shading. **Studio 4, Credit 2 (W, S)**

0825-206

## Figure Drawing

Introduces students to the study of the human form, including quick gesture drawing, contour studies, line drawing, proportion, shading and light, study of head/facial features and use of quick sketches and sustained study, including use of the figure in composition. Students are introduced to media and materials used to draw the human form. **Studio 4, Credit 2 (W, S)**

0825-208

## Drawing Composition

Use of drawing principles learned in previous drawing courses will be applied to drawing still life, architecture, various environments and the human form within environments. Use of sketchbooks is emphasized for development of compositions. Students are encouraged to research visual ideas through the use of library and other sources. A variety of media and materials will be used. (0825-204, 206) **Studio 4, Credit 2 (F, S)**

0825-210

## Vector Graphics

Students learn to use vector-based illustration programs to create color graphics using various basic Bezier functions of the programs, such as the pen tool, basic shapes tool set, brushes, type and related sub-menus. Fundamentals of color, including gradient, radial, blend, and mesh gradient functions, are taught. Comprehension and correct use of terminology/vocabulary and concepts are emphasized. **Studio 4, Credit 2 (W, S)**

0825-211

## Basic Design

Emphasis is on concepts, elements and exploration of basic two-dimensional design principles such as point, line, shape, texture and space using black-and-white media for presentation of ideas. Technical quality in presentation of design concepts is emphasized. **Studio 4, Credit 2 (F, W)**

0825-212

## Color in Design

In this course, color theory is emphasized and concepts learned in Basic Design are applied using color media and materials to solve basic design problems. Technical quality in presentation of design concepts is emphasized. (0825-211) **Studio 4, Credit 2 (W, S)**

0825-213

## Design for Graphics

Students apply fundamentals of basic design, color theory and composition to explore a wide variety of solutions to simple graphic design problems. Focus will be on techniques and tools used to visualize and create clear, effective, well-crafted thumbnails and rough layouts. Emphasis is on process, rather than finished work, and students are encouraged to experiment with a range of media. (0825-105, 212) **Studio 4, Credit 2 (F, S)**

0825-221

## Basic Typography

Students learn the fundamentals and principles of typography, including type measurement/point sizes, type classification/type families, identification of typefaces, effective use of letter spacing, word spacing, line spacing, line length and type arrangements. (0825-109, 210) **Studio 4, Credit 2 (F, S)**

0825-230

## Electronic Layout Programs

Computer page layout programs are taught through the use of professional tutorials and supplemental practice materials. Students acquire a good working knowledge of page layout software used in most graphic design studios and agencies. (0825-109) **Studio 4, Credit 2 (F, S)**

0825-281

## Drawing Applications

An advanced course refining freehand and technical drawing concepts, methods and techniques developed in Perspective Drawing, Figure Drawing and Drawing Composition. Emphasis is on development of advanced drawing skills, using various subjects, media and processes. Elective course for both art and computer design students and students in other majors. (0825-208) **Studio 4, Credit 2 (W)**

0825-282

## Applied Art Photography

Use of photographic processes as they relate to the applied artist. Emphasis is on understanding and using the camera and related processes for obtaining a well-crafted photographic image. Elective course for both art and computer design students and students in other majors. **Studio 4, Credit 2 (F, S)**

0825-284

## Three-Dimensional Applications

Extends basic concepts, principles and methods as they apply to three-dimensional form. Emphasis is on material characteristics, tool/material processes, construction techniques and craftsmanship. Elective course for both art and computer design students and students in other majors. **Studio 4, Credit 2 (W, S)**

0825-299

## Co-op: Art and Computer Design

This 10-week, full-time experience gives students matriculated in the art and computer design program a sampling of the world of work in the applied art field under the supervision of qualified professionals such as production managers and art directors. Students complete a workbook as part of this experience. The experience must be satisfactorily completed before the student enrolls in the final courses of the major. (0825-322, 324, 344, 0806-101) **Credit 0 (F, W, S, Su)**

0825-301

## Graphics for Communication

Using design concepts and practices learned in the first level of the program, students work through steps of the design process, including definition and research of simple graphic design problems and development and presentation of solutions through clear, well-executed thumbnail sketches, roughs and comprehensive layouts. Students learn how to select printing papers and finishing methods. Major emphasis is given to verbal presentation of layout ideas, group production meetings and group critiques. (0825-110, 210, 213) **Studio 6, Credit 3 (F, W)**

0825-310

## Digital Illustration

Provides students with comprehensive skills in the area of computer illustration. Student focuses on comparison, use, integration and functions of several illustration photo manipulation software programs to create professional-quality renderings for print publication. (0825-109, 110, 208, 210) **Studio 4, Credit 2 (F, W)**

0825-315

## Art History I

Survey of major historical developments in the visual arts as they relate to the field of art, specifically examining art from prehistoric times to the late Renaissance at the end of the 16th century. **Class 3, Credit 3 (F)**

0825-316

## Art History II

Survey of major historical developments in the visual arts, specifically examining Western art from the Baroque period of the 17th century to the post-Impressionists to current movements in fine art. (0825-315) **Class 3, Credit 3 (W)**

**0825-317** **History of Graphic Design**  
Survey of art and design movements, designers and typographers who have made significant contributions to the field of graphic design. (0825-316) **Class 3, Credit 3 (S)**

**0825-321** **Type in Design**  
Students focus on selection of appropriate type to best communicate a message, use of type as an integral part of a design, how to choose letter, word and line spacing, line length and type arrangement. Emphasis is on working with type and grids, legibility and readability, proofreaders' marks and proofreading and copy specification. (0825-210, 221) **Studio 4, Credit 2 (F, W)**

**0825-322** **Basic Production**  
Course provides an overview of the production concentration, and students learn the fundamentals of preparing production art for black-and-white and color reproduction and using page layout and illustration software. Technical vocabulary related to preparing artwork for printing is emphasized. (0825-210, 221, 230) **Studio 4, Credit 2 (W, S)**

**0825-324** **Introduction to Print Design**  
This overview of the print design concentration introduces students to the various areas within the general field of print design, including corporate graphic design, information design, advertising/promotion design and publication design/editorial design. Students become familiar with the broad range of print design and are required to create several examples of print design. Students also are expected to use correct graphic design vocabulary and demonstrate understanding of design principles and the design process by discussing and evaluating their own and others' work. (0825-301, 310, 321) **Studio 4, Credit 2 (W, S)**

**0825-326** **Grid Systems**  
Provides students with knowledge needed to understand and utilize grids and other organizational systems to solve graphic design problems. Students are asked to use pre-designed grid systems and will design and apply their own systems to solve graphic design problems related to publication page layout as they become proficient in understanding and using these systems. This course is part of the print design concentration. (0825-324, 344) **Studio 4, Credit 2 (F, S)**

**0825-327** **Identity Systems Design**  
Emphasis is on design and development of identity symbols/logos/logotypes and systems of identification for corporations, businesses and organizations as well as individuals, including business cards, letterheads, envelopes, invoices and other components. Focus is on analysis of company need, audience, budget, compatibility, design consistency and practicality. This course is part of the print design concentration. (0825-324, 344) **Studio 6, Credit 3 (F, S)**

**0825-328** **Multi-page Design**  
Focus is on layout and design of multi-paged printed graphics, including brochures, booklets, catalogs, calendars and magazine spreads using grids and other organizational systems. Issues such as page sequencing and pagination and design flow and consistency through the layout/design and successful communication of the client's needs are addressed. Projects are completed using page layout software that is consistent with industry standards. This course is part of the print design concentration. (0825-326, 327) **Studio 6, Credit 3 (F, W)**

**0825-329** **Production for Designers**  
Students continue to learn skills needed to produce art for black-and-white and color reproduction. Students use computer skills to create and prepare more complex, multi-page production art. Technical vocabulary related to preparing artwork for printing is emphasized. This course is part of the print design concentration. (0825-322) **Studio 4, Credit 2 (F, W)**

**0825-344** **Introduction to Web Design**  
An overview of the Web design concentration is provided, and students are introduced to the fundamental skills needed to use the World Wide Web, learn basic HTML programming for graphics, and learn legal issues of the Internet. Issues concerning successful use of typography, color and composition are discussed. Students are expected to create Web pages that demonstrate their understanding and use of basic design principles. (0825-301, 310, 321) **Studio 4, Credit 2 (W, S)**

**0825-346** **Creating Web Graphics**  
Introduces Internet graphics and how they are related to the World Wide Web. Students gain in-depth knowledge of graphics preparation and optimizing graphics for use on the Internet. Course content includes exploring the Internet, using various programs to create and optimize images for use on the Internet, and the use of basic HTML programming. Vocabulary of the Internet, various graphic file formats, compression schemes, and concepts of effective graphic communication on the Internet are also discussed. This course is part of the Web design concentration. (0825-324, 344) **Studio 4, Credit 2 (F, S)**

**0825-347** **Designing Websites**  
Students continue to learn how to use design elements successfully to create a multi-page website. Students are introduced to the concept of website design, site navigation theories and the management of a multi-page website. Students explore advanced techniques of web design with the inclusion of video and programmed elements. This course is part of the Web design concentration. (0825-346, 0805-251) **Studio 4, Credit 2 (F, W)**

**0825-351** **Graphic Studio**  
An advanced course stressing layout, mechanical and computer skills within the context of a professional studio environment. The course involves practical work experience with an emphasis on studio procedures, work habits, professional skills and dealing with clients as well as working in teams to solve design problems. (0825-322, 324, 344) **Studio 8, Credit 4 (F, W, S)**

**0825-352** **Portfolio Presentation**  
Art and computer design students' final professional preparation course prior to graduation. Students must prepare and submit a portfolio of artwork for final review by a jury composed of department faculty members and professional artists. (0825-299, 351) **Studio 8, Credit 4 (F, W, S)**

**0825-382** **Computer Illustration Techniques**  
Students experiment and further explore the creative possibilities of several illustration software programs. Students will have the opportunity to create professional quality illustrations for various audiences and print media. This is an elective course for both art and computer design students and students in other majors. (0825-310) **Studio 4, Credit 2 (W, S)**

**0825-398** **Special Topics - Art and Computer Design**  
**Credit variable (F, W, S)**

**0825-399** **Independent Study - Art and Computer Design**  
**Credit variable (F, W, S)**

## Arts and Imaging Studies

**0855-251** **Bitmap Graphics**  
This course introduces students to the skills needed for the successful production and manipulation of raster images using image manipulation software. Students will master the application of painting and editing tools and techniques offered by the software program such as selection techniques, basic layer controls, digital masking, image correction and enhancement. Additional topics will include the relevance of image size, resolution and file format specifications when working with raster images. Comprehension and correct usage of terminology and concepts are emphasized. **Class 2, Lab 3, Credit 3 (F, W)**

**0855-252** **Vector Graphics**  
This course introduces student to using vector graphic applications to generate professional looking vector based layouts. Emphasis is placed on mastering vector-based tools as preparation for intermediate and advanced digital imaging and publishing skills development. Page layout, type specification, and graphics integration are covered. **Class 2, Lab 3, Credit 3 (F, W)**

**0855-253** **Typography I**  
Typography is an integral element of all good design, affecting both aesthetics and functionality. In this course, students learn the fundamentals and principles of typography, including type measurement/point sizes, type classification/type families, identification of typefaces, effective use of letterspacing, wordspacing, linespacing, line length and type arrangements. Students will learn type terminology, font selection guidelines, font management, and strategies/methods to ensure optimal readability and legibility. Students will develop typographic design skills that can be applied in a wide variety of graphic applications. **Class 2, Lab 3, Credit 3 (F, W)**



**0855-254 Applied Color Theory**  
This course includes the study of color for design, printing, Web, and photographic imaging systems and procedures. Students will use and apply correct technical vocabulary, various concepts, and procedures regarding the perception, recognition, selection, specification, application, and evaluation and correction of color in various graphic arts workflows and application. Students will use and apply the artist's color wheel, various color models, and specification systems. **Class 2, Lab 3, Credit 3 (W, S)**

**0855-255 Design Concept Development**  
Students will be introduced to the basic elements of two-dimensional monochromatic design, compositional principles, and approaches to analysis of design problems, techniques for gathering resources to work toward possible design solutions and visualization of design concepts through the use of idea sketches to final comprehensive layouts. Students will also utilize basic design vocabulary to participate in critiques for the purpose of analyzing their own and other students' work. This course provides students in non-creative technical majors as well as those pursuing more creative endeavors within the graphic arts field with a fundamental overview and understanding of the design process to expand critical awareness of the importance of good design. **Class 2, Lab 3, Credit 3 (W, S)**

**0855-256 Publishing Fundamentals**  
This course provides an overview of page layout and publishing procedures and related career opportunities in the graphic communications. This course will enable students to develop an understanding of types of publications and publishing strategies as well as the roles of designer, publisher, production personnel. Students will use and apply appropriate page layout software used in design and production of printed pages for single and multiple-page documents. Students will use authoring software used in the design and production of web pages and media presentations. This course will prepare students for further study in graphic design, desktop publishing, and Web page development. **Class 2, Lab 3, Credit 3 (W, S)**

**0855-299 Co-op: Arts & Imaging Studies**  
This course provides a ten-week work experience in the field. (0855-319 or 0855-324 or 0855-33 or 0855-344) **Credit 0 (F, W, S, Su)**

**0855-310 Visual Idea Development**  
This course gives students the opportunity to see themselves, their experiences and their environment as sources of creativity, through a variety of activities which include classroom discussions, field trips, guest lecturers and keeping written journals and sketchbooks. Students learn strategies for developing concepts and organization of thought processes as well as systems to formulate solutions to design problems. The library is used for development of research skills. **Class 3, Credit 3 (F, W)**

**0855-311 Basic Drawing**  
This course will give students an introduction to the fundamentals of perspective, including one-point, two-point, three-point perspective, special vanishing points, mixed perspective and ellipses. Basic three-dimensional shapes will be drawn using both freehand techniques and drafting tools. Perspective concepts will also be applied to drawing more complex objects and environments, including tonal values. **Class 2, Lab 3, Credit 3 (F, W)**

**0855-312 Intermediate Drawing**  
This course is an introduction to the study of the human form, including quick gesture drawing, contour studies, line drawing, proportion, shading and light, study of head/facial features, using quick sketches, sustained study and use of the figure in composition. Students will be introduced to media and materials used to draw the human form. (0855-311) **Class 2, Lab 3, Credit 3 (W, S)**

**0855-313 Advanced Drawing**  
In this course, the use of drawing principles learned in previous drawing courses will be applied to drawing still life, architecture, various environments, and the human form within environments. The use of sketchbooks will be emphasized for development of compositions—students will be encouraged to research visual ideas through the use of library and other sources. A variety of media and materials will be used. (0855-312) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-314 Color in Design**  
In this course, color theory is emphasized and concepts learned in Basic Design are applied, using color media and materials to solve basic design problems. Technical quality in presentation of design concepts is emphasized. (0855-255 or 0855-310) **Class 2, Lab 3, Credit 3 (W, S)**

**0855-315 History of Graphic Design**  
This course includes the study of a survey of art and design movements, designers, and typographers who have made significant contributions to the field of Graphic Design. **Class 3, Credit 3 (F, S)**

**0855-316 Art History I**  
Survey of major historical developments in the visual arts, specifically examining art from prehistoric times to the Renaissance. **Class 3, Credit 3 (F, W)**

**0855-317 Art History II**  
Survey of major historical developments in the visual arts, specifically examining western art from the Baroque period of the 17th century to current movements in the fine arts. (855-316) **Class 3, Credit 3 (W, S)**

**0855-318 Typography I**  
In this course, students focus on selection of appropriate type to best communicate a message, use of type as an integral part of a design, including how to choose letterspacing, wordspacing, linespacing, line length and type arrangement to best work in a design. There is also emphasis on working with type and grids, legibility and readability, proofreaders' marks and proofreading and copy specification. (0855-252, 253, 255, 256) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-319 Graphic Design**  
Students will apply principles and techniques learned in Design Concept Development to work through steps of the design process, including definition and research of graphic design problems, development and presentation of solutions through clear, well-executed idea sketches, "roughs," and comprehensive layouts using appropriate design techniques and typography. Special emphasis will be placed on identifying client need and the message to be communicated, identifying the appropriate audience and developing a design solution that will successfully communicate the client's message to that audience. Students in this course will also be introduced to the various areas of graphic design, including corporate graphic design, information design, advertising/promotion design, and publication design/editorial design. Students also learn how to select printing papers and finishing methods. In addition, students will be introduced to graphic design business practices. Focus will also be on verbal presentation of layout ideas, group production meeting times, and group critiques. (0855-251, 252, 253, 254, 255, 256) **Class 2, Lab 3, Credit 3 (F, W)**

**0855-321 Image Acquisition**  
The student will build on the skills previously learned in Bitmap Graphics course. Topics include: determining and applying resolution and magnification settings appropriate to the characteristics of the specified output goal; setting highlight and shadow points, removing color cast, sharpening, and tone-adjustment of acquired images; use desk-top scanners hardware/software; use appropriate color settings/modes and file formats. (0855-251, 254) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-322 Image Manipulation**  
The students will build on the skills previously learned in Bitmap Graphics. Topics include applying production planning techniques to image manipulation, production quality standards, advanced methods and quality criteria for image manipulation, legal and ethical issues. This is a production-oriented course with the emphasis on producing photographic quality (raster) digital images. (0855-251, 254) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-323 Digital Photography II**  
This course gives students an introduction to the tools, techniques and terminology of electronic imaging through a series of hands-on activities that will permit each student to investigate the applications of digital photography. Students will be expected to capture images using digital cameras, process digital images using the appropriate software, create quality picture files and participate in project-related critiques. **Class 2, Lab 3, Credit 3 (F, S)**

**0855-324 Wide Format Graphics**  
Wide format ink jet printing is one of the fastest growing market segments. Products include large display signage and decals, vehicle wraps, packaging mock-ups, point-of-purchase display elements, vinyl appliqué, magnetic and tie-back signage, and large-scale presentation displays, and other large-scale signage. This course provide students with a unique set of knowledge and skills required for the preparation, production, finishing, material handling, mounting and displaying of wide format products. (0855-251, 252, 253, 254, 255, 256) **Class 2, Lab 3, Credit 3 (F, W)**

**0855-331 Desktop Publishing I**  
The students will use page layout (desktop publishing) applications to design pages and documents and to produce pages and documents to given specifications; importing and placing text and graphic files; the application of style sheets, templates, snippets, libraries, and color specifications. The application of design and typographic principles, industry terminology and measurement systems, font management, and file management are emphasized. (0855-251, 255, 256) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-332 PDF Production & Workflow**  
The students will study the Portable Document Format (PDF) file format including defining and applying specifications for color management, file optimization and file security; recognizing and editing PDF documents; and using PDF files in a variety of print and non-print media production workflows. (0855-253, 255, 256) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-333 Publication Production I**  
The students will study the use of page layout applications to produce book, magazine, and long format publications. Topics include techniques for defining and applying publication templates; font management and selection; page formats; page and section numbering; headers and footers; text editing; graphics creation, preparation, and placement; color specification and usage; automating a table of contents; using a colophon and other features typical for book and long document publishing formats. Students are introduced to the repurposing of documents for interactive digital media and XML-based document production. (0855-251, 252, 254, 331) **Class 2, Lab 3, Credit 3 (F, W)**

**0855-334 Database Publishing**  
The students will study the principles and techniques of database construction, manipulation, and reporting. This course provides the opportunity to develop expertise in creating graphically attractive and informationally useful reports both within the layout capabilities of a database application, and through importation into a page layout program, and conversion into a form compatible with a Web server. Topics include database formation, document tagging, template generation, style sheets, HTML coding, and database publishing techniques and procedures. (0855-253, 255, 256) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-341 Graphics for the Web**  
This course provides an overview of creating graphics for the web, including an introduction to Internet graphics and how they are related to the World Wide Web. Students gain in-depth knowledge of graphics preparation and optimizing graphics for use on the Internet. Course content includes exploring the Internet, using various programs to create and optimize images for use on the Internet, and the use of basic HTML programming. There will also be a focus on the vocabulary of the Internet, various graphic file formats, compression schemes, and concepts of effective graphic communication on the Internet. (0855-251, 252, 254) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-342 Web Design I**  
This course introduces students to the fundamental skills needed to create designs that work on the World Wide Web. Students are introduced to the Internet, learn basic HTML programming for graphics, and legal issues of the Internet. Text based technology is used to separate design from content using templates and cascading style sheets (CSS). CGI and Javascript are used to add basic interactivity to the site, such as forms and counters. Issues concerning what works most successfully relating to typography, color, composition, format, and audience understanding are discussed. Students are expected to create web pages that demonstrate their understanding and use of basic design principles. (0855-253, 254, 255, 256) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-343 Computer Animation**  
In this course, students will learn how to create illustrations, create web animations, develop web-based and stand-alone interactive media, and develop design elements that are used to enhance web design. Course content includes understanding staging, timelines, frame rates, keyframes, transitions, and object attributes. Both vector and raster animation applications are taught and used in the course. Throughout the quarter, students will learn the vocabulary and skills necessary to create basic to intermediate skill level computer animation projects. (0855-251, 252, 254) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-344 Videography**  
This course provides an overview of videography for the web. This is a basic digital video course that will introduce the participants to the process and procedures involved in digital video production from start to finish. Students will be introduced to videography production techniques, cameras, digital non-linear editing, and lighting for video. Emphasis is on proper operation of video and computer equipment for productions and post-production of digital non-linear edited sequences and their adaptation to different presentation formats for online delivery. (0855-254, 255) **Class 2, Lab 3, Credit 3 (F, W)**

**0855-351 Production Fundamentals**  
This course reinforces the students' skills learned in core courses. Students are introduced to procedures that are used in an actual graphic communications production environment, understanding the cost of doing business, estimating procedures and quality control requirements. This course enables the student to develop and apply team-building and problem-solving skills as they are guided through integrated activities from creation to final product in both print and non-print media workflows. (0855-251, 252, 253, 254, 255, 256) **Class 2, Lab 3, Credit 3 (F, W)**

**0855-352 Color Management**  
The students will study color management system (CMS) software and color measurement devices as they are used to control color quality in the digital imaging and publishing disciplines. CMS concepts are introduced and applied to imaging equipment (input, display, and output), systems, and documents. (0855-251, 252, 253, 254, 255, 256) **Class 2, Lab 3, Credit 3 (F, W)**

**0855-353 Practicum/Portfolio Presentation**  
This course will give students from all areas of study in the Arts and Imaging Studies Department an opportunity to work together in a simulated professional environment on actual client jobs, from initial design concept development to final production. Students must also prepare and submit a portfolio of their work for final review by a jury composed of department faculty members and professionals. The course will emphasize professional procedures, work habits, and demonstration of creative and technical skills, depending on the students' areas of expertise, as well as appropriate communication with clients, presentation techniques, and ability to work as a fully contributing member of a team. (0855-299) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-354 Applied Production I**  
This elective two-course sequence provides an environment where students and customers interact in order to produce completed graphics projects and finished print jobs. Students work in a simulated design and production environment where they can develop their technical skills, work habits, and customer relations. (0855-351) **Class 2, Lab 3, Credit 3 (S)**

**0855-355 Applied Production II**  
This elective two-course sequence provides an environment where students and customers interact in order to produce completed graphics projects and finished print jobs. Students work in a simulated design and production environment where they can develop their technical skills, work habits, and customer relations. (0855-354) **Class 2, Lab 3, Credit 3 (F)**

**0855-361 Grid Systems**  
This course will provide students with the knowledge needed to understand and utilize grids to organize graphic design elements for readability and consistency in various media. Students will be first asked to use pre-designed grid systems for layout and design, and as they become proficient in the understanding and use of these systems will develop their own grid systems to solve graphic design problems. Assignments will be completed using page layout software that is consistent with industry standards. (0855-319) **Class 2, Lab 3, Credit 3 (W, S)**

**0855-362 Publication Design**  
In this course, focus will be placed on layout and design of multi-paged printed graphics including brochures, booklets, catalogs, calendars, and magazine spreads and the use of grids and other organizational systems. Issues such as page sequencing and pagination, design flow and consistency through the layout/design and successful communication of the client's needs will be addressed. Assignments will be completed using page layout software consistent with industry standards. (0855-351, 352, 361) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-363 Identity Systems Design**  
In this course, students will learn about various classifications and areas of identity design and will develop identity symbols and systems of identification and branding for businesses and organizations as well as individuals, including components such as business cards, letterheads, envelopes and invoices. Focus will be on identifying client need, budget and target audience in order to develop appropriate identity design solutions with components that are compatible, consistent, and practical to use. Students are expected to find a real client for at least one of the assignments for this course. In addition, students will be familiarized with current top identification system designers and current design trends in identity design. (0855-319, 351, 352) **Class 2, Lab 3, Credit 3 (W, S)**

**0855-364 Digital Illustration**  
This course will provide students with skills and techniques used in areas of digital illustration, including comparison, techniques and functions of vector and bitmap software programs to create professional-quality renderings. Various kinds of illustration will be introduced, including editorial, book, and information illustration such as illustrated charts and graphs. Students will have the opportunity to create professional quality illustrations for various audiences and media. (0855-251, 252, 254, 311) **Class 2, Lab 3, Credit 3 (F, W, S)**

**0855-371 Dynamic Image Preparation**  
This course will address various technologies for the capturing and converting of multiple static images into more dynamic presentations of environments, and objects. Topics will include panoramic stitching, creating virtual tours, creating 360 degree views of 3D objects, and creating dynamic slideshows. (0855-251, 252) **Class 2, Lab 3, Credit 3 (F, W, S)**

**0855-372 Composite Imaging**  
This course includes specialized image manipulation techniques applied to produce images that blend images together into a single composite image. Emphasis is given to developing efficient production techniques for this advanced image manipulation concept. (0855-322, 351, 352) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-373 Digital Photography II**  
This course is a continuation of Digital Photography I. Students will continue to use and apply correct technical vocabulary, various concepts, and procedures regarding the technical understanding and use of digital photography equipment and software. Aesthetic/composition considerations will be emphasized as well. Various genres and markets will be discussed such as Photo Journalism, Portraiture, Fine art, Advertising and Marketing, and Sports. (0855-323) **Class 2, Lab 3, Credit 3 (W)**

**0855-374 Image Retouch and Restore**  
This course includes specialized image manipulation techniques used to reconstruct, restore, and enhance images. Emphasis is given to developing skills for image evaluation and for production work plan strategies. (0855-251, 254) **Class 2, Lab 3, Credit 3 (W, S)**

**0855-381 Desktop Publishing II**  
This course builds on topics presented in Desktop Publishing I. Students will define and apply techniques and procedures for optimizing document design and production efficiency. Topics include defining Paragraph, Character, and Object styles; making and using templates; saving and accessing object snippets and libraries; recognizing and applying proofreaders marks and notations; defining and applying advanced typographic techniques, advanced page layout procedures, object transparency and other image effects; building and editing tables; and, defining and applying color specifications and effects. Students will continue to develop knowledge and skills in the industry leading page layout software applications. (0855-251, 252, 254, 331) **Class 2, Lab 3, Credit 3 (W, S)**

**0855-382 Interactive PDF Publishing**  
Interactive digital document files in the Portable Document Format (PDF) have become an effective and widely-used strategy for presentations, training materials, and information collection and distribution. In this course students will use Adobe Acrobat for making and using interactive PDF files. Topics include adding interactive features including bookmarks, action button, hyperlinks to internal anchors, hyperlinks to other documents and Web content. Emphasis is given to file optimization for interactive display size formats, color, and resolution. (0885-251, 252, 254, 332) **Class 2, Lab 3, Credit 3 (W, S)**

**0855-383 Publication Production II**  
In this course, students will build on the concepts and skills learned in Publication Production I. Students will understand and apply techniques and procedures specific to the layout and production of multi-section/multi-chapter publications for on-demand, mass market, and PDF digital document output and distribution. (0855-333, 351, 352) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-384 Digital Printing Systems**  
This course will focus on the operating features of the black & white and color digital production printing systems. Students will learn the job and market capability of the various systems, xerography concepts in monochrome printing, image and paper quality considerations, creation of electronic files and file transfer, and operating procedures. Additional topics include the digital workflow for on-demand book printing and small-format binding. **Class 2, Lab 3, Credit 3 (W)**

**0855-391 Web Design II**  
This is a required course that provides an understanding of basic web site creation. This course introduces students to the fundamental skills needed to create content and layouts that work on the World Wide Web. Graphics based technology is used to create interactive pages. Topics include rollover buttons, using image slices to maximize delivery speeds, using image maps, graphic behaviors, GIF animations, design and development of navigation systems. Usability issues will be introduced and studied, especially focusing on the ADA accessibility laws. Students are expected to create web pages that demonstrate their understanding and use of basic publishing and coding principles. (0855-341, 342, 351, 352) **Class 2, Lab 3, Credit 3 (W, S)**

**08055-392 Web Design III**  
This course provides an overview of designing multi-page web sites. In this course, students will continue to learn how to use design elements successfully to create a multi-page web site. Students will continue the study and application of concepts of Web site design, site navigation theories, and the management of a multi-page web site. In this course, students will develop a web site combining the advantages of text based production techniques for content management with graphics based design for appeal and animation. Audience interactivity will be incorporated throughout. Effective use of color, typography, and design will be applied. (0855-391) **Class 2, Lab 3, Credit 3 (F, S)**

**0855-394 Interactive Digital Media**  
This course provides an overview of designing interactive digital media. In this course, students will continue to learn how to use design elements successfully to create a multi-page web site. Students will be introduced to the concepts of designing and developing interactive digital media, user interface theories, and the management and development of an interactive digital media file. Students will also create and prepare digital elements for network use. Issues of file size, quality, format, client/server interaction are covered. 2D/3D vector and raster graphics will be used along with animation, video and presentation applications (0855-341, 342, 343, 344, 351, 352) **Class 2, Lab 3, Credit 3 (S)**

**0855-398 Special Topics: Arts and Imaging Studies**  
**Credit Variable (F, W, S)**

**0855-399 Independent Study: Arts and Imaging Studies**  
**Credit Variable (F, W, S)**

## Automation Technologies

**0891-210 Pneumatics and Hydraulic Systems**  
The basics of fluid power is the course focus. Areas of study include pressure, viscosity, turbulence, flow, thermal properties and displacement. Hydraulic/pneumatic components such as pumps, actuators, valves, accumulators, lines, directional controls, sealing devices and servomechanisms are introduced, as are the tools and procedures used to install and maintain hydraulic/pneumatic systems. (0885-201) **Class 1, Lab 6, Credit 3 (S)**

**0891-212 Industrial Electronics**  
This course will introduce students to basic electrical concepts, circuits and devices used in automated systems. Students will study different forms of electrical power and the laws associated with them. Various electrical/electronic devices used in controlling, filtering and displaying power states will be studied. Safely and correctly connecting and installing devices and cables using schematic diagrams and electrical instrumentation will be included. (0813-222, 0890-214) **Class 2, Lab 6, Credits 4 (S)**

**0891-214 Electromechanical Devices**  
This course introduces various devices used in the manufacturing environment for automation control. The most commonly used AC and DC motors, stepper motors, motor controllers and servomotor drives are used in laboratory set-ups along with sensors and transducers used in monitoring or controlling the manufacturing process. Relays, contactors, starters, symbols, ladder diagrams, motor connections, overload protection and interlocking schemes are studied. In addition, control loops, feedback, rate response, proportional control, process instruments and sensor interfaces as they apply to automatic control systems are studied in detail. (0805-240; corequisite: 0805-245) **Class 2, Lab 6, Credit 4 (F)**

**0891-216 Programming Concepts**  
This course introduces problem-solving processes and programming concepts as they can be used to guide automation control systems and other automated system subsystems. Programming structure and flowcharting are studied. Students are exposed to programming applications with automated control systems and are expected to write simple programs. (0813-222, 0890-214) **Class 3, Lab 3, Credit 4 (S)**

**0891-218 Robotics Fundamentals**  
Students begin to learn about industrial robots and their applications in automated manufacturing industries. Students learn robotic safety practices, robotic coordinate systems, basic mechanics and power systems for robots and some interfacing considerations. (0891-201) **Lab 2, Credit 1 (W)**

**0891-220 Automated Systems I**  
This course reinforces previously learned subsystem-level skills while introducing additional concepts and skills at a system level. System assembly, wiring, programming, networking, monitoring (data collection and analysis) and troubleshooting are addressed. Basic robotic technology is introduced as part of an automated system. Students also work in a semiconductor clean-room environment in preparation for choosing a concentration in either the semiconductor or the applied robotics option. (0891-210, 214, 216) **Class 2, Lab 6, Credit 4 (W)**

**0891-230 Automated Systems Troubleshooting I**  
This course introduces skills associated with performing basic system maintenance and troubleshooting. Maintenance sheets, along with the appropriate equipment manuals, procedures, tools and instrumentation to safely and correctly perform the maintenance functions, are considered. Data from system performance charts are interpreted and used to make necessary process or equipment adjustments. Skills needed to diagnose and repair a system fault in a safe and logical manner are introduced and performed according to manufacturer specifications. (0891-220) **Class 2, Lab 6, Credit 4 (S)**

**0891-299 Co-op: Automation Technologies (0891-230)**  
**Credit 0 (F, W, S)**

**0891-314 Programmable Logic Controllers (PLC) Programming**  
Students begin to learn about the use of programmable logic controllers (PLCs). Content includes the concepts of PLC programming and interfacing and the development of PLC applications. Students use PLC program development software, test PLC applications and modify PLC programs to effect process changes as indicated. (0891-212) **Class 2, Lab 6, Credit 4 (F)**

**0891-316 Mechanical Devices and Systems**  
This course builds on course work introduced in prior physics and automated system courses. Students learn about mechanical components found in transmission pathways of automated systems, including drive mechanisms, pallet changers, shifters, conveyers, gears and linkages. Students analyze factors contributing to mechanical failure such as load and torque. Effects of changes in pressure, direction, force, speed and other physical parameters are also studied. Students work with simulated modules and automated systems with mechanical components. (0885-201; corequisite: 0891-220) **Class 1, Lab 6, Credit 3 (W)**

**0891-318 Applied Robotics**  
Students use, maintain, develop and debug robotic programs. Course content requires that students learn the concepts related to robotic programming and interfacing as well as the applications that use robotics. Using lab experiments and robotics program development software, students learn to set up, install, download, diagnose, write, manipulate and test programs in automated manufacturing environments. (0891-220) **Class 2, Lab 6, Credit 4 (S)**

**0891-320 Automated Systems II**  
This course builds on the system-level skills developed in Automated Systems I and Automated Systems Troubleshooting I. Students encounter advanced robotic operations, process and equipment control using programmable logic controllers and material transport systems as they learn to work with product changeovers relative to upgrading or retooling a flexible manufacturing cell. Human machine interfaces (HMI) and electronic operator interfaces (EOI) are used for machine user interfacing. (0891-220, 314) **Class 2, Lab 6, Credit 4 (S)**

**0891-330 Automated Systems Troubleshooting II**  
This advanced troubleshooting course not only incorporates all the maintenance and troubleshooting skills developed in Automated Systems Troubleshooting I for basic system maintenance, diagnosis and repair but also introduces maintenance and troubleshooting of the more difficult and advanced system areas such as networked controllers, vision systems, advanced robotics, programmable logic controllers, and other system and subsystem components where hardware and software are heavily integrated for system operation. (0891-320) **Class 2, Lab 6, Credit 4 (F)**

**0891-398 Special Topics - Automation Technologies**  
**Credit variable (F, W, S)**

**0891-399 Independent Study - Automation Technologies**  
**Credit variable (F, W, S)**

## Communication Studies

Communication studies courses may satisfy the social sciences, humanities or, in some cases, deaf studies graduation requirements. The 200-level courses satisfy the AOS requirement for general education. Interpersonal Relationships, Group Dynamics and Effective Teams, and Organizational Communication and the Deaf Employee satisfy the AOS communication requirement.

**0880-101 Foundations of Critical Thinking**  
This course sharpens students' ability to think clearly, logically and creatively and to communicate knowledge effectively in an academic setting. Critical thinking strategies are learned for examining issues and solving problems. Course topics include problem solving using a five-step model; analyzing and giving directions; classifying and sequencing information; identifying multiple perspectives on an issue; analyzing arguments used to support a position; and creating visual representations of problems and solutions. The importance of thinking critically for effective communication regardless of modality (writing, reading, signing, speaking, listening) is stressed. (ACT reading score 1-11 or permission of instructor) **Class 3, Credit 3 (F, W)**

**0880-201 Interpersonal Relationships††**  
This course examines the role of communication as it relates to establishing, maintaining and ending relationships. Topics include: relationship development; self-concept; perceptions and first impressions; stereotyping, prejudice and discrimination; conflict resolution; active and passive listening; personal and social values; self-disclosure, gender-related communication, and communication among Deaf and hearing people. (Qualified to enter an AOS degree program or permission of instructor) **Class 3, Credit 3 (F, W, S)**

**0880-202 Intercultural Communication††**  
This course is intended to provide students with an introduction to the concepts of culture, communication and intercultural communication as they relate to face-to-face communication. The students will learn about the relationship between culture and communication and how to reduce potential conflict. Skills learned in this course apply to communication in everyday situations as well as the work setting. (ACT reading score 14-16 or permission of instructor) **Class 3, Credit 3 (W, S)**

**0880-204 Effective Presentations††**  
This course assists students in developing the ability to research, prepare and deliver effective presentations. Students learn to specify a topic, research sources of information, evaluate the value of the information using critical thinking skills, develop an outline and investigate strategies for delivery, including visual aids. Students also learn to analyze intended audiences for appropriateness of language use, communication mode and register. (ACT reading score 14-16 or permission of instructor) **Class 3, Credit 3 (W, S)**

†This course satisfies the humanities requirement.

‡This course satisfies the social sciences requirement.

**0880-206** **Group Dynamics and Effective Teams†‡**  
This course focuses on the information and skills needed to be a knowledgeable, effective participant in small groups. Topics related to group dynamics and team building are addressed at the practical and theoretical levels. These topics include characteristics of effective teams, stages of group development, techniques for group self-analysis, how groups operate for different outcomes, group vs. personal goals, the role of diversity, and group decision-making and problem-solving techniques. (Qualified to enter an AOS degree program or permission of instructor) **Class 3, Credit 3 (F, W, S)**

**0880-207** **Organizational Communication and the Deaf Employee\*†‡**  
This course examines interpersonal and small group communications in organizational settings in today's corporate climate, with emphasis on important aspects of communication for deaf individuals entering a professional career. Students become familiar with the business environments of large and small companies and the implication of company size regarding personnel decisions. Case studies from selected corporations provide insights into elements of communication processes such as networks (electronic and non-electronic), organizational structures, managerial decision making, interviewing, organizational development and conflict resolution. Companies' perspectives on hiring culturally and ethnically diverse individuals and deaf individuals are discussed. Laws, such as ADA, related to the hiring and support of disabled workers are addressed. (Qualified to enter an AOS degree program or permission of instructor) **Class 3, Credit 3 (F, W, S)**

**0880-210** **Internet Communication†‡**  
This course assists students in gaining a better understanding of computer-based communication systems and related legal and ethical issues. Students learn to skillfully work with systems such as the Internet and Web and available services such as notes, e-mail, newsgroups, bulletin boards, distribution lists and home pages. Applications to workplace/employment situations, job searches and personal use are examined. RIT policies, applicable copyright laws, cost, benefits, advantages and disadvantages are incorporated into the syllabus. The course is continually updated as new information technologies become available. (ACT reading score 14-16 or permission of instructor) **Class 3, Credit 3 (F, W, S)**

**0880-398** **Special Topics – Communication Studies**  
**Credit variable (F, W, S)**

## Computer Aided Drafting Technology

**0890-208** **A/E/C Measurement Systems**  
This course provides students with hands-on experience with basic measuring instruments used in the architectural/engineering/construction (A/E/C) industry. Students practice measurement skills in lab and field settings and use computer simulations. Care and handling of the instruments, data collection, management, analysis and other calculations are developed. Students learn standard procedures to report and display measurement information. (0890-214) **Class 1, Lab 3, Credit 2 (S)**

**0890-210** **Construction CAD I**  
In this course students learn computer aided drafting (CAD) skills to produce contract documents, manage files and organize graphic content for construction projects. Students will produce working drawings for a variety of architectural/engineering construction types. (0890-212) **Lab 12, Credit 4 (S)**

**0890-212** **Computing Tools for Engineering Technology**  
This course provides a foundation of computer skills common to classroom and work environments in engineering-related fields. These include skills with using operating systems, networks, the Internet, common office productivity tools and graphics tools. Most assignments will include engineering communication and problem-solving components. **Class 2, Lab 4, Credit 4 (F)**

**0890-214** **CAD Applications in Engineering Technology**  
Students continue developing engineering skills in engineering graphics and solid modeling. Students will primarily use computer aided drafting (CAD) as a tool to generate 2D graphics and 3D solid models. The course is laboratory oriented and provides the student with basic skills in spatial visualization, freehand sketching, parametric solid modeling, and creation of engineering drawings that meet industrial drafting standards. (0813-220, 0890-212; corequisite: 0813-222) **Class 2, Lab 4, Credit 4 (W)**

**0890-215** **Manufacturing CAD I**  
This course introduces students to basic 3-D manufacturing CAD concepts. Students will create a solid model that they will translate into 2-D drawings. The topics will include basic drawing techniques such as orthographic projection, dimensioning and engineering detail drawings. (0890-202) **Lab 12, Credit 4 (S)**

**0890-216** **Design, Dimensioning and Tolerancing**  
Students continue developing basic engineering skills through project-based problem-solving and design exercises. Geometric dimensioning and tolerancing (GD&T) skills are the focus of this course. Course work requires students to evaluate the functional requirements of parts and assemblies, use GD&T to specify those requirements, and relate process capabilities to design specifications. (0890-214; corequisite: 0813-224) **Class 2, Lab 4, Credit 4 (S)**

**0890-220** **Construction CAD II**  
Students learn to apply 3-D CAD techniques to a bi-level construction project situated on a site with modest topographic features. Concepts associated with the structural system are integrated into the construction of the 3-D model. Students will extract a series of orthographic and pictorial views from the model, producing a comprehensive set of working drawings. (0890-210) **Lab 12, Credit 4 (F)**

**0890-230** **Construction CAD III**  
Students learn to apply 3-D CAD techniques to a multi-level construction project situated on a site with significant topographic features. Students will function as a team to create a total project model. Concepts of structural systems will be integrated into the construction of the building models. Students will extract and refine a series of orthographic views from the site and building models such that a comprehensive set of working drawings is produced. (0890-220) **Lab 12, Credit 4 (W)**

**0890-235** **Electrical CAD**  
This course covers the principles and practices of printed circuit board drafting and design. Students will design printed circuit boards from schematic diagrams. Topics will include schematic capture, surface-mounted and through-hole mounted theory of printed circuit board design and fabrication. (0890-250, 225) **Lab 12, Credit 4 (W)**

**0890-250** **Electronic Components**  
This course is designed to introduce students to surface-mounted and through-hole electronic components and how they function within a circuit. Students will use CAD to produce schematic diagrams and build breadboards from their schematic drawings. (0890-215) **Class 2, Lab 3, Credit 3 (F)**

**0890-255** **Construction Materials and Methods I**  
Students begin to learn about the common structural materials used in construction. Content includes vocabulary, identification, characteristics, origins, sources, standard sizes and shapes, units of measure, and methods for testing and acceptance. Students use standard references and classification systems for materials and products. (0890-208) **Class 2, Lab 3, Credit 3 (F)**

**0890-260** **Geometric Dimensioning and Tolerancing**  
The course is designed to give students an overview of geometric symbols and how they affect the shape and features of a part or object in relationship to size. Students learn a drawing language that fosters uniform understanding among design, production and inspection groups. Topics will include form controls, datums, orientation controls and location controls per industrial standard ASME/ANSI Y 14.5M-1994. (0890-206, 215) **Class 3, Credit 3 (F)**

**0890-265** **Construction Materials and Methods II**  
This course is a continuation of the Construction Materials and Methods I course. Students learn standard classification systems and use reference sources to investigate materials and products. Students select construction materials and products and integrate their selections into design solutions. This course focuses on non-structural materials and products associated with the construction industry. (0890-255) **Class 2, Lab 3, Credit 3 (W)**

**0890-270** **Introduction to Manufacturing Materials**  
A study of engineering-related materials/characteristics, structure and properties as they apply to design and fabrication. The emphasis will be on metallic, polymeric, ceramic and composite materials as related to atom movement and phase changes. (0890-225, 250) **Class 2, Lab 3, Credit 3 (W)**

\*This course satisfies the deaf studies/American Sign Language requirement.

†This course satisfies the humanities requirement.

‡This course satisfies the social sciences requirement.

**0890-275** **Principles of Structural Systems**  
Students learn the basic concepts of loads and stresses and how the structural members of a construction project support loads. This overview includes the practical aspects of how structural elements are assembled and incorporated into construction projects. (0890-255) **Class 3, Credit 3 (W)**

**0890-280** **GIS Fundamentals**  
Students develop basic skills in applications of geographic information systems (GIS). Through hands-on projects, students will learn how to use GIS software, plan a project, create a database, conduct spatial analysis and create presentation graphics. No official prerequisites are required, but students should have basic computer literacy skills. **Class 2, Lab 3, Credit 3 (S)**

**0890-299** **Co-op: Computer Aided Drafting Technology**  
Designed to give the student an opportunity to gain experience on the job, to apply what has been learned and to self-evaluate personal and communication skills. Placement assistance is provided to help the student find a relevant work experience. **Credit 0 (F, W, S, Su)**

**0890-310** **Advanced Construction CAD**  
Students develop the CAD drafting skills gained in previous courses by adding skills in design development. The project, a building of two or more stories, requires the synthesis of information and principles both from previous courses and from reference sources. The use of these reference sources is an important part of the instruction. (0890-230, 265, 275) **Lab 12, Credit 4 (S)**

**0890-315** **Electrical/Mechanical CAD Design**  
This course includes an electrical/mechanical design project in which students apply the knowledge, concepts and techniques learned in previous CAD courses. Students create a basic design that includes a printed circuit board (PCB) interfacing with a chassis and/or mechanical assembly. The students are given engineering design projects to choose from and must decide all the parameters of the design. The course uses a team approach whereby the students simulate a professional drafting team. (0890-235, 270) **Lab 15, Credit 5 (S)**

**0890-320** **Presentation Graphics**  
Students gain specialized skills and knowledge in production of presentation graphics using CAD. Using their general CAD skills as a starting point, they learn to produce various types of 3-D views, fly-throughs, virtual reality, and Web graphics for presentation of construction projects to clients, agencies, boards and the public. Students will also gain basic skills and knowledge in geographic information systems using GIS software. (0890-310) **Lab 12, Credit 4 (F)**

**0890-325** **3-D Solid Modeling**  
This course covers advanced concepts in solid modeling and also provides students with opportunities to work in teams. Students are given a project that is divided between them. Each student is required to create a part of the project using advanced 3-D CAD techniques. Components used on the project must be researched and downloaded from the Web and other digital sources. Students will also use the "no-dimensioning" technique, creating 3-D solid modeling assemblies for size and fit. (0890-315) **Lab 15, Credit 5 (F)**

**0890-350** **Introduction to Material Processes**  
The course covers the application of processes and techniques to engineering-related materials in the manufacture of products. Processes emphasized will be machining, cutting, casting, molding, forging, forming and joining. (0890-270) **Class 3, Credit 3 (S)**

**0890-355** **Site Utilities, Mechanical and Electrical Systems for A/E/C**  
Students learn to identify the basic equipment, requirements and operation of site utilities and mechanical and electrical systems for construction projects. The systems include water supply, sanitary sewers and treatment, storm drainage, solid waste handling, gas, power, telephone, cable services, fire protection, heating, ventilating, air conditioning, lighting, communication systems and conveying systems. Students become acquainted with the graphic representations of this equipment and these systems on construction documents. (0890-220, 265) **Class 3, Credit 3 (S)**

**0890-375** **Construction Regulations**  
Students gain a general knowledge of laws, codes, ordinances, regulations, approval processes and approving agencies or bodies that affect construction projects. Students gain a basic understanding of how these regulations and processes are applied to the work they will perform. (0890-255, 265, 275) **Class 3, Credit 3 (F)**

**0890-398** **Special Topics—  
Computer Aided Drafting Technology**  
**Credit variable (F, W, S)**

**0890-399** **Independent Study—  
Computer Aided Drafting Technology**  
**Credit variable (W)**

## Computer Integrated Machining Technology

**0813-139** **Blueprint Reading I**  
Students develop the skills necessary to read and interpret engineering drawings of details and assemblies. (0884-180) **Class 1, Lab 3, Credit 2 (F)**

**0813-140** **Blueprint Reading II**  
Students develop the skills necessary to read and interpret prints of engineering drawings of details and assemblies. (0813-139) **Class 1, Lab 3, Credit 2 (W)**

**0813-152** **Manufacturing Analysis**  
Introduction to manufacturing concepts. Students learn modern methods of planning, producing and controlling manufactured goods. The text and class discussions focus on problem solving and industrial operations. (0813-134) **Class 4, Credit 3 (S)**

**0813-220** **Engineering Fundamentals**  
Students develop basic engineering skills through project-based problem-solving and design exercises. Data collection, analysis and technical communication skills are emphasized. Course work requires students to apply knowledge and skills related to mathematics, science and English courses. (Corequisite: 0890-212) **Class 2, Lab 4, Credit 4 (F)**

**0813-222** **Manufacturing Processes**  
This course focuses on understanding and applying basic manufacturing processes. Students will learn how typical industrial piece parts and assemblies are manufactured. Topics emphasize safety and focus on processes and related theory for material removal, sheet metal forming, joining, casting and molding in a project-based format. (0813-220, 0890-212; corequisite: 0890-214) **Class 2, Lab 4, Credits 4 (W)**

**0813-224** **Industrial Processes**  
This course will focus on the understanding and application of non-traditional manufacturing processes such as electrical discharge machining (EDM), electrochemical machining (ECM), photochemical machining (PCM), ultrasonic machining, laser cutting, plasma cutting, rapid prototyping, etc. This is a project-based course; the student will, alone or in a team, investigate one of the processes in depth and give a presentation on how it is applied to a specific part. (0813-222 and 0890-214; corequisite: 0890-216) **Class 2, Lab 4, Credits 4 (S)**

**0813-231** **CIMT 1**  
Students develop basic skills for operating computer-controlled machine tools. Laboratory instruction simulates introductory-level work in an industrial environment; student work is held to ISO-referenced standards for dimensional and geometric accuracy. Safety work habits are cultivated, and industrial safety rules are highly stressed during this course. (0813-220, 0890-212, 0813-222, 0890-214; corequisite: 0813-255) **Class 1, Lab 5, Credit 3 (S)**

**0813-232** **CIMT 2**  
Students deepen basic skills in operating and programming computer-controlled machine tools. Laboratory instruction simulates intermediate-level work in an industrial environment. The student's work is held to ISO-referenced standards for dimensional and geometric accuracy. Safety in the operation and programming of automated machines is an integral part of the course. (0813-231; corequisite: 0813-252) **Class 1, Lab 8, Credit 4 (F)**

†This course satisfies the humanities requirement.

‡This course satisfies the social sciences requirement.

0813-233

**CIMT 3**

Students develop advanced skills in programming computer-controlled machine tools. A progressively more difficult series of projects sets the pace of the course. Laboratory instruction continues to simulate an industrial environment; student work is held to ISO-referenced standards for dimensional and geometric accuracy. Safety in the operation and programming of automated machines is an integral part of the course. (0813-232, 0813-252; corequisite: 0813-254) **Class 1, Lab 8, Credit 4 (W)**

0813-234

**CIMT 4**

Students continue to develop advanced skills in programming computer-controlled machine tools. The most challenging projects of the CIMT series are presented in this course. Laboratory instruction simulates the atmosphere of the demanding industrial environment. Student work is rigorously held to ISO-referenced standards for dimensional and geometric accuracy. Safety work habits for programming, set-up and operation of automated machines are an integral part of the course. (0813-233, 0813-254; corequisite: 0813-257) **Class 1, Lab 8, Credit 4 (S)**

0813-250

**Introduction to Computer Numerical Control**

Students develop basic knowledge in principles, concepts and terminology of computer-numerical-controlled machining (CNC). Students review CNC history, development and applications and learn basic programming formats and techniques. (0813-222) **Class 1, Lab 2, Credit 2 (S)**

0813-251

**Industrial Materials**

Introduction to the many materials used in industry and the reasons why the final cost of producing a part is influenced by material selection. Metals, plastics and ceramics are covered from the perspectives of physical, mechanical and dimensional properties. (0813-231) **Class 3, Credit 3 (F)**

0813-252

**CNC Graphics**

Students develop basic skills in programming CNC machine tools. Laboratory instruction simulates an industrial environment; student work is held to ISO-referenced standards for dimensional and geometric accuracy. Safety in the operation of automated machines is an integral part of the course. (0813-250, 0813-231; corequisite: 0813-232) **Lab 6, Credit 3 (F)**

0813-254

**CNC Solids**

Students develop skills in using solid modeling techniques to program CNC machine tools. Laboratory instruction simulates an industrial environment; student work is held to ISO-referenced standards for dimensional and geometric accuracy. Safety in the operation of automated machines is an integral part of the course. (0813-232, 0813-252; corequisite: 0813-233) **Lab 6, Credit 3 (W)**

0813-255

**Precision Measurement**

Students develop the skills necessary to measure to the highest tolerances commonly used in industry. They measure parts or groups of parts using industrial methods and equipment. Analysis of measurements and problem solving is stressed. **Class 1, Lab 3, Credit 2 (S)**

0813-257

**CNC Toolpaths**

Students develop skills in creating, editing and verifying toolpaths; copying and pasting parameters, toolpaths and tool associative geometry; and modifying geometry and machining parameters to update toolpaths. Laboratory instruction simulates an industrial environment; student work is held to ISO-referenced standards for dimensional and geometric accuracy. Safety in the operation of automated machines is an integral part of the course. (0813-233, 254; corequisite: 0813-234) **Lab 6, Credit 3 (S)**

0813-258

**Automated Machining**

Students continue to develop advanced skills in programming computer-controlled machine tools. Projects involve the production of fixtures and planning for short- and long-run production. Laboratory instruction simulates an industrial environment; student work is held to ISO-referenced standards for dimensional and geometric accuracy. Safety in the operation of automated machines is an integral part of the course. (0813-234, 257, 299) **Class 1, Lab 12, Credit 6 (F)**

0813-299

**Co-op: Computer Integrated Machining Technology**

**Credit 0 (Su)**

0813-399

**Independent Study—  
Computer Integrated Machining Technology**

**Credit variable (W)**

†This course satisfies the humanities requirement.

‡This course satisfies the social sciences requirement.

## Deaf Studies

Deaf studies/American Sign Language courses also satisfy social sciences and humanities requirements as noted. C-level courses or above satisfy the AOS requirement.

### Fundamental (Level B)

0880-190

**Introduction to Deaf Studies†**

Introduces students to major concepts and issues in the field of deaf studies. The course integrates the fields of history, anthropology, linguistics, creative arts and literature as they apply to Deaf culture and the Deaf community. The course is designed to foster students' active participation as a means of developing strong leadership and advocacy skills among NTID students. After completing this course, students will be able to pursue specific areas of interest within the deaf studies/ASL program. (ACT arts/literature reading score 1-4 or permission of instructor). **Class 3, Credit 3 (F, W)**

0881-166

**Sign Mime and Creative Movement†**

Focuses on the dominant historical form of expression used by theaters of the Deaf. Topics include principles for effective use of space, creative movement strategies and expression of original ideas in sign-mime. This course satisfies the deaf studies requirement. (ACT arts/literature reading score 1-4 or permission of instructor) **Class 3, Credit 3 (F, W)**

0886-150

**Introduction to American Sign Language†**

Introduces knowledge about American Sign Language (ASL), provides a basic understanding of ASL and discusses principles of sign formation. The course also compares aspects of different visual communication modalities and spoken language. Strategies for learning ASL will be discussed. **Class 3, Credit 3 (F)**

0886-199

**American Sign Language II†**

Designed for students who have no previous knowledge of American Sign Language. ASL I includes the linguistic features, cultural protocols and core vocabulary for students to function in basic ASL conversations: ASL grammar for asking and answering questions while introducing oneself; exchanging personal information; talking about family, friends and surroundings; and discussing activities. Classroom and lab activities include practicing conversations and videotaping. (SIPI/LCBQ:1) **Class 4, Credit 4 (F, W)**

### Intermediate (Level C)

0880-207

**Organizational Communication and the Deaf Employee†‡**

Examines interpersonal and small group communications in organizational settings in today's corporate climate, with emphasis on important aspects of communication for deaf individuals entering a professional career. Students become familiar with the business environments of large and small companies and the implication of company size regarding personnel decisions. Case studies from selected corporations provide insights into elements of communication processes such as networks (electronic and non-electronic), organizational structures, managerial decision making, interviewing, organizational development and conflict resolution. Companies' perspectives on hiring culturally and ethnically diverse individuals and deaf individuals are discussed. Laws, such as ADA, related to the hiring and support of disabled workers are addressed. (Qualified to enter an AOS program or permission of instructor) **Class 3, Credit 3 (F, W, S)**

0880-247

**Deaf Art/Deaf Artists†**

Examines art works and artists' statements, goals and intentions. The artwork and the statements of artists are examined to determine if the artists focus on being deaf as the subject of their art or if the focus of their art is related to Deaf issues or other subjects. By examining these connections and influences and comparing the varieties of choices artists have made, a definition of Deaf Art is developed. From the readings and reviews, students develop a list of issues that lead to identification of a person as a Deaf artist or an artist who is deaf. The question of what is culture and what is art is examined, and comparisons to cultural groups are made. An in-depth analysis of Deaf View/Image Art (De'VIA) will be conducted, and parallels will be drawn to other disenfranchised groups' artwork. Furthermore, students will create their own self-portrait using De'VIA themes and/or motifs. **Class 3, Credit 3 (F, S)**

0881-204

**Deaf Theater History†**

Examines the Deaf experience in theater and the roles that deaf people have played in theater history. Particular attention is given to the documented achievements of individuals and companies in the 19th and 20th centuries. This course satisfies the deaf studies requirement. (ACT arts/literature reading score 5-7 or permission of instructor; 0881-202 or 0882-221) **Class 3, Credit 3 (W)**

0882-221

**Deaf Heritage†**

The course will examine the lives of deaf people throughout history, particularly during critical events such as revolutions, wars, the Great Depression and into the modern era with legislative acts that have led to significant changes in education and employment. Simultaneously, the formation of the Deaf community and Deaf culture will be studied to illustrate the meaning of “Deaf heritage.” Hard-of-hearing and late-deafened individuals involved in the Deaf community will be included, and racial, ethnic and gender issues will be discussed as they relate to this heritage. Students learn how technology has impacted the lives of deaf people, as have local, state and national organizations of the deaf. The achievements of many deaf people in a variety of fields will underscore self-identity and self-advocacy issues. (0882-200) **Class 3, Credit 3 (F, W, S)**

0882-222

**Deaf Culture and Community†**

Introduces students to aspects of Deaf culture and community around the world. The distinction between these is reviewed, and characteristics of each are identified. Students learn about the language, norms of behavior, values, traditions and possessions of deaf people. Deaf culture and community are analyzed from a historical and sociological perspective. Cross-cultural issues relating to the role of hearing people with the Deaf community are also covered. (0882-200 or permission of instructor) **Class 3, Credit 3 (W)**

0882-223

**Deaf Women’s Studies†**

This course provides a historical review of deaf women in their professional and personal lives. The issues covered in this course include the exploration of the social, political and economic conditions affecting deaf women and how this compares to other women in society. Hard-of-hearing and late-deafened women and ethnic/minority women with hearing loss are included in this course. Students will be able to summarize trends from the social/political analysis and apply their learning to their own personal development and empowerment. (0882-200 or permission of instructor) **Class 3, Credit 3 (F, S)**

0886-200

**American Sign Language II†**

Expands the basic principles presented in ASL I. The course teaches students to use linguistic features, cultural protocols and core vocabulary to function in additional basic ASL conversations, including ASL grammar, for giving directions; describing others; making requests; talking about family, occupations and routines; and attributing qualities to others. Classroom and lab activities include practicing conversations and videotaping. (0886-199 or equivalent) **Class 4, Credit 4 (F, W, S)**

0886-201

**American Sign Language III†**

This course is a continuation of ASL II, expanding the emphasis on ASL grammar, syntax, spatial referencing and vocabulary development. ASL III teaches further communicative competencies in ASL conversations beyond the basic level that include telling life events, describing events in time, asking for clarification, correcting, conforming, elaborating on information, agreeing and disagreeing, resolving conflicts and giving directions. Classroom and lab activities include practicing dialogues, short stories, narratives and short conversations. (0886-200 or equivalent) **Class 4, Credit 4 (F, W, S)**

0886-249

**Structure of American Sign Language†**

Provides students with basic knowledge about the linguistic structure of American Sign Language (ASL). Through an introduction to language components, students examine the phonology, morphology and syntax of ASL. Information regarding historical and cultural aspects of ASL is also introduced and discussed. This course is taught in ASL. **Class 3, Credit 3 (F, W, S)**

**Bridging (Level D)**

0881-259

**Creative Translation for Stage†**

Focuses on different translation forms used by theater, mime and dance companies. Students learn to distinguish between English and American Sign Language (ASL). They translate stories, poems and plays into ASL and other sign languages. Theatrical integrity dealing with translation issues and visual access is a central goal. (ACT arts/literature reading score 8-10 or permission of instructor; 0881-210 or 256) **Class 3, Credit 3 (S)**

0882-285

**Civil Rights and Deaf People†**

Reviews the history of oppressed groups in the United States and their struggle for equality. Parallels will be drawn between various groups with a focus on deaf people. Patterns of oppression and empowerment will be compared and contrasted for black Americans, Native Americans, women, lesbians and gays, and deaf people. Specific strategies and techniques employed to gain civil rights are covered. Court cases are reviewed and discussed. (ACT social studies/science reading score 9-11 or permission of instructor) **Class 3, Credit 3 (W, S)**

0886-250

**Introduction to ASL Teaching†**

Provides overview of how second languages have traditionally been taught, what the current methods and theories are, and their applications to the teaching of sign language. Students are provided opportunities to practice basic teaching techniques, select appropriate materials, and learn basic curriculum design and evaluation techniques, including how to teach cultural and grammatical features in lessons. Students learn about resources to support their efforts to teach sign language. **Class 3, Credit 3 (W, S)**

## Digital Imaging and Publishing Technology

0878-210

**Digital Design and Typography**

Digital photography, graphics and typography blend to communicate quickly and memorably as well as beautify a layout. The student will learn basic design and typography principles, terminology, guidelines, methods and systems used to solve graphic design problems. Font management and color model specifications are also included. Students will develop design and typography skills that can be applied in a wide variety of digital pre-press and presentation media applications. Typography study will emphasize font selection, font management, and typesetting and copy fitting functions as critical elements of successful page layout design. **Class 2, Lab 3, Credit 3 (F, S)**

0878-215

**Fundamentals of Image Acquisition**

This course introduces the student to reflective and transmission scanning of two-dimensional art per given specifications; acquiring photographic images from Photo-CD, CD-ROM, digital cameras, grabbing video images; acquisition of text and graphics from online networks such as the Internet and WWW; acquisition of text with OCR scanning; and applying image size, resolution and file format specifications to image files. **Class 2, Lab 3, Credit 3 (F, W)**

0878-220

**Fundamentals of Image Manipulation**

This course introduces students to the production and manipulation of raster images with image manipulation software. Topics covered will include the study and application of painting and editing tools and techniques; selection techniques and digital masking to manipulate raster images; and application of image size, resolution and file format specifications. The technology and processes taught in this course will reflect the current trends in the marketplace. **Class 2, Lab 3, Credit 3 (F, S)**

0878-225

**Fundamentals of Vector Graphic Illustration**

This course introduces the student to using digital illustration and page design programs to generate vector-based images. Emphasis is on mastering vector-based tools as preparation for intermediate and advanced digital imaging and publishing skill development. Assignments emphasize the use of the computer in preparing images for print and media publication. Page layout, type specification and graphics integration are covered. **Class 2, Lab 3, Credit 3 (W, S)**

0878-230

**Fundamentals of Desktop Publishing**

This course includes the use of desktop publishing applications to create pages and documents to specification; importing and placing text and graphic files; the application of style sheets, templates and libraries; and color specifications. The application of design and typographic principles, trade terminology and measurement systems, font management and file management are emphasized. **Class 2, Lab 3, Credit 3 (F, W)**

0878-235

**Fundamentals of Digital Media Publishing**

In this course students prepare basic digital presentations for computer display. Skills include aretext import, entry and editing; graphic import, editing and basic creation; and acquisition and placement of motion graphic elements. An overview of hardware and software requirements will be presented. **Class 2, Lab 3, Credit 3 (F, S)**

†This course satisfies the humanities requirement.

‡This course satisfies the social sciences requirement.



**0878-240** **Fundamentals of Network Publishing**  
This course uses network publishing software to generate and distribute PDF pages and to create linked pages to specifications for the World Wide Web. Other topics include an overview of Internet resources, Web page description languages, image standards and browser software. **Class 2, Lab 3, Credit 3 (W, S)**

**0878-245** **Fundamentals of Digital Output**  
This course includes the fundamentals of file, system and device preparation required for output to PostScript and non-PostScript devices. Other topics include the technologies associated with standard industry output devices, image evaluation and network communication protocols. **Class 2, Lab 3, Credit 3 (F, W)**

**0878-250** **Color Theory and Practice**  
This course includes the study of the identification of colors; factors affecting color perception and recognition; color correction; and design and production influences on the selection of color specification systems, such as Pantone, Trumatch and custom colors. **Class 2, Lab 3, Credit 3 (W, S)**

**0878-255** **Imaging Processes and Markets**  
This course presents an overview of the major imaging processes in printing (lithography, gravure, flexography, screen printing, digital and non-impact) and multimedia publishing (interactive CD ROM, World Wide Web, electronically delivered documents) together with a study of their respective and overlapping markets and career opportunities. **Class 2, Lab 3, Credit 3 (F, W, S)**

**0878-299** **Co-op Digital Imaging and Publishing Technology**  
**Credit 0 (F, W, S, Su)**

**0878-300** **Desktop Publishing**  
This course builds on topics presented in Fundamentals of Desktop Publishing. Topics include defining and applying style sheets, templates and libraries; recognizing and applying proofreaders' marks and notations; and defining and applying color model specifications. (0878-210, 230, 245) **Class 2, Lab 3, Credit 3 (F, W)**

**0878-302** **Database Publishing**  
This course includes the principles and techniques of database construction, manipulation and reporting. It provides the opportunity to develop expertise in creating graphically attractive and informative reports within the layout capabilities of a database application and through importation into a page layout program and conversion into a form compatible with a Web server. Topics include database formation, document tagging, template generation, style sheets, HTML coding and database publishing techniques and procedures. (0878-210, 230, 245) **Class 2, Lab 3, Credit 3 (F, S)**

**0878-304** **Publication Publishing**  
This course includes the use of page layout and special-purpose applications to produce book, magazine and long-format publications. Topics include techniques for defining and applying font selections, page formats, page and section numbering, headers and footers, footnotes, text editing, graphics, color, table of contents, index, glossary, appendix, colophon and other features typical of book and long-document publishing formats. Students are introduced to the repurposing of documents into various forms of digital media and the creation, manipulation and use of digital photographs. (0878-300) **Class 2, Lab 3, Credit 3 (W)**

**0878-305** **PDF Production and Workflow**  
This course includes the study of the portable document format (PDF) file format. It includes defining and applying specifications for color management, file optimization and file security; recognizing and editing PDF documents; and using PDF files in a variety of print and non-print media production workflows. (0878-230, 245, 250) **Class 2, Lab 3, Credit 3 (W)**

**0878-306** **Network Publishing**  
This course builds on the skills previously learned in Fundamentals of Network Publishing. Topics include Internet resources, network publishing and Web page authoring, including the use of features such as forms and tables. (0878-210, 240, 250) **Class 2, Lab 3, Credit 3 (W, S)**

**0878-308** **Digital Media Publishing**  
In this course students take written and illustrative information, create and prepare digital elements that relate to the topic, and organize the result into electronic presentations for DVD, CD-ROM or network use. Issues of typography, quality, format, layout and audience are included. Word processing, desktop publishing, vector and raster graphics, and presentation applications will be used. Scripting and markup languages will be introduced. (0878-210, 240, 250) **Class 2, Lab 3, Credit 3 (F, S)**

**0878-310** **Image Acquisition**  
This course builds on the skills previously learned in Fundamentals of Image Acquisition. Topics include determining and applying resolution and magnification settings appropriate to the characteristics of the specified output device; setting highlight and shadow points; removing color cast, unsharp masking, and tone adjustment of acquired images; use of high-end, mid-range, and desktop scanners and their related software; optimizing images recorded by amateur, professional and prosumer digital cameras; jobs for RGB output; and changing image files for other purposes (repurposing). (0878-215, 245, 250) **Class 2, Lab 3, Credit 3 (F, S)**

**0878-312** **Image Manipulation**  
This course builds on the skills previously learned in Fundamentals of Image Manipulation. Topics include applying production planning techniques to image manipulation, production quality standards, advanced methods and quality criteria for image manipulation, legal and ethical issues. This is a production-oriented course with the emphasis on producing photographic quality (raster) digital images. (0878-215, 220, 245, 250) **Class 2, Lab 3, Credit 3 (F, W)**

**0878-314** **Preparing Photographs for Publishing**  
This course focuses on editing digital files to produce specific black-and-white and color reproduction outcomes on a variety of publishing systems; i.e., network printers, film recorders (slides), the Web, CDs and offset presses. It teaches how to prepare the image files and related workflow procedures while reinforcing many of the skills learned in the prerequisite courses. (0878-300 or 0878-310) **Class 2, Lab 3, Credit 3 (S)**

**0878-316** **Black-and-White and Color Halftone Production**  
This course focuses on editing digital files to produce specific black-and-white and color halftone outcomes on a variety of printing systems; i.e., laser printers, network printers, digital presses, direct-to-plate systems and offset presses. The application of production criteria for the full variety of screening options for image files and the related workflow procedures are designed to reinforce many of the skills learned in the prerequisite courses. (0878-314) **Class 2, Lab 3, Credit 3 (W)**

**0878-318** **Color Management Systems**  
This course includes the study of color management system (CMS) software and color measurement devices as they are used to control color quality in the digital imaging and publishing disciplines. CMS concepts are introduced and applied to imaging equipment (input, display and output), systems and documents. (0878-215, 220, 245, 250) **Class 2, Lab 3, Credit 3 (F, W)**

**0878-322** **Composite Imaging**  
This course includes specialized image manipulation techniques that blend images into a single composite image. Emphasis is given to developing efficient production techniques for this advanced image manipulation technique. (0878-310, 312) **Class 2, Lab 3, Credit 3 (W)**

**0878-324** **Image Retouching and Restoration**  
This course includes specialized image manipulation techniques used to reconstruct, restore and enhance images. Emphasis is given to developing skills for image evaluation and production work-plan strategies and techniques. (0878-310, 312) **Class 2, Lab 3, Credit 3 (S)**

**0878-326** **Videography**  
This course introduces students to videography, cameras, videocassette recording, digital non-linear editing and lighting. Emphasis is on proper operation of video and computer equipment for production and post production of digital non-linear edited sequences and their adaptation to different presentation formats. Students gain hands-on experience in making a digital video. (0878-210, 220, 225, 235) **Class 2, Lab 3, Credit 3 (W)**

*\*This course satisfies the deaf studies/American Sign Language requirement.*

- 0878-328 Digital Media Interactive**  
In this course students create and prepare digital elements and integrate them into interactive presentations for DVD, CD-ROM or network use. Issues of file size, quality, format, client/server interaction are included. 2-D/3-D vector and raster, animation, video and presentation applications will be used. (0878-308) **Class 2, Lab 3, Credit 3 (S)**
- 0878-330 Preflight Procedures**  
This course includes the study of procedures to inspect files for adherence to production standards and specifications and to modify and apply necessary job specifications. Focus will be on font, color and trapping specifications; picture and graphic file types and linkages; measurements and typographic specifications; output device-specific parameters. (All 0878-200 level) **Class 2, Lab 3, Credit 3 (F)**
- 0878-332 Image Assembly: Trapping and Imposition**  
This project-based course includes the study of trapping and imposition variables, an overview of production workflow, and use of software solutions for trapping and imposition. Emphasis is given to the study of press and post-press factors that impact trapping and imposition. (0878-210, 225, 230, 245, 255) **Class 2, Lab 3, Credit 3 (W)**
- 0878-341 Proofing and Platemaking**  
The course includes the study of procedures to produce analog monochrome and color proofs and analog offset plates to production standards and specifications; the comparison of various analog proof types and capabilities; the comparison of types of offset plates; proof and plate processor care and maintenance; and exposure, processing and inspection procedures. (0878-250, 255) **Class 2, Lab 3, Credit 3 (W)**
- 0878-344 Offset Press Operation I**  
This course emphasizes the systematic methods of press preparation and operation of offset printing technology. Emphasis is on sheet control, set-up of ink and dampening systems and introduction to four-color process printing. (0878-343) **Class 2, Lab 3, Credit 3 (W)**
- 0878-345 Offset Press Operation II**  
This course continues the development of offset press operation skills. Areas of study include process color printing, densitometry, quality control test targets and investigative press problem solving. Students will develop production skills in a simulated production setting. (0878-344) **Class 2, Lab 3, Credit 3 (F, S)**
- 0878-346 Digital Printing Systems**  
This course presents a study of digital printing system technology and marketplace production issues and prepares students with the technical knowledge and skills to output, and potentially operate, a variety of digital printing systems. (0878-245, 250, 255) **Class 2, Lab 3, Credit 3 (F, S)**
- 0878-351 Fundamentals of Photographic Imaging**  
This course includes the study of the fundamental principles, processes and equipment used in the production of photographic images. Topics include the proper use of darkroom equipment (enlargers, easels, timers, processors, etc.) and the application of tone and color control in the production of photographic proofs and prints. (0878-250, 255) **Class 2, Lab 3, Credit 3 (F, S)**
- 0878-352 Photographic Imaging**  
This course builds on the skills introduced in Fundamentals of Photographic Imaging. It introduces calibration and evaluation of photographic images and equipment using standard reference materials and industry methods. Other topics include the continued production and evaluation of photographic prints from a variety of formats to satisfy provided specifications. (0878-351) **Class 2, Lab 3, Credit 3 (W)**
- 0878-353 Photographic Imaging Production**  
This course builds on the photographic imaging skills beyond the essentials covered in previous photographic imaging courses by requiring greater depth of expertise and providing greater breadth of experience. The course includes additive and subtractive system exposure equipment; the operation of mechanized processors and exposure equipment; applied densitometry; and production techniques for quality and quantity. (0878-352) **Class 2, Lab 3, Credit 3 (F, S)**
- 0878-354 Advanced Photographic Imaging**  
This course includes the production of negatives from transparencies; color and density matching a photographic print to a sample; and photographic print production from slides. Emphasis is given to following standard lab practices for safety, quality and productivity. (0878-353) **Class 2, Lab 3, Credit 3 (W)**
- 0878-355 Display Imaging**  
This course includes the study and production of captioned prints, prints and transparencies for display use, and mural prints. Emphasis is given to comparative finishing techniques, quality control issues, comparative materials specifications, lab safety and technical vocabulary. (0878-354) **Class 2, Lab 3, Credit 3 (F, S)**
- 0878-356 Copywork**  
This course includes the set-up and use of optical camera systems to produce copy and duplicate images. Topics will include determination of exposure, copywork magnification, filter factors and the production of copy and duplicate images using provided specifications. (0878-351) **Class 2, Lab 3, Credit 3 (W)**
- 0878-361 Production Procedures and Quality Control**  
This course reinforces the students' skills in the core courses. Students are introduced to procedures that are used in an actual printing production environment, understanding the cost of doing business, estimating procedures and quality control requirements. This course prepares the student for continuation on to the applied production print sequence of courses as well as success in the working world. (All 0878-200 level) **Class 2, Lab 3, Credit 3 (F, W, S)**
- 0878-362 Applied Production I**  
This elective three-course sequence provides an environment where students and customers interact in order to produce completed imaging projects and finished print jobs. Students work in a simulated production environment where they can develop their technical skills, work habits and customer relations. (0878-361) **Class 2, Lab 3, Credit 3 (F, W, S)**
- 0878-363 Applied Production II**  
This elective three-course sequence provides an environment where students and customers interact in order to produce completed imaging projects and finished print jobs. Students work in a simulated production environment where they can develop their technical skills, work habits and customer relations. (0878-362) **Class 2, Lab 3, Credit 3 (F, W, S)**
- 0878-364 Applied Production Lab III**  
This elective three-course sequence provides an environment where students and customers interact in order to produce completed imaging projects and finished print jobs. Students work in a simulated production environment where they can develop their technical skills, work habits and customer relations. (0878-363) **Class 2, Lab 3, Credit 3 (F, W, S)**
- 0878-371 Beginning DocuTech Operations**  
This course will focus on the fundamental operating features of the Xerox DocuTech 135 publishing system. It provides an opportunity to understand the job and market capability of the DocuTech, xerography, image and paper quality considerations and basic operating procedures. This course is the first of a two-course sequence that can lead to employment opportunities as a DocuTech operator. (0878-230, 245, 255) **Class 2, Lab 3, Credit 3 (F, S)**
- 0878-372 Advanced DocuTech Operations**  
This course will focus on the advanced operating features of the Xerox DocuTech 135 publishing system. It provides an opportunity to understand the job and market capability of the DocuTech, creation of electronic files and file transfer, and advanced operating procedures. This course is the second of a two-course sequence that can lead to employment opportunities as a Xerox DocuTech operator. (0878-371) **Class 2, Lab 3, Credit 3 (W)**
- 0878-398 Special Topics - Digital Imaging and Publishing Technology**  
**Credit variable (F, W, S)**
- 0878-399 Independent Study - Digital Imaging and Publishing Technology**  
**Credit variable (F, W, S)**

\*This course satisfies the deaf studies/American Sign Language requirement.

## English

### Academic Writing

#### Introductory (Level A)

0883-101

#### Writing I

In this developmental course, students learn and practice the writing skills necessary to enter Academic Writing II. Strategies to discover (from personal experience and resource materials), develop and organize thoughts on various topics are presented. Students organize and develop paragraphs and texts in various forms, including narration and description. Students also learn to revise, edit and present texts for specific groups of readers. (NTID Writing Test score below 40) **Class 4, Credit 4 (F, W, S)**

0883-102

#### Integrated Reading and Writing I

This is the first course in a two-course developmental sequence in which students work on the reading and writing skills necessary for all degree programs at NTID. Students develop the English language knowledge, reading comprehension strategies and written language skills included in Nonfiction Reading I and Academic Writing I. Students also learn strategies for integrating the use of reading and writing. Upon successful completion of this two-course sequence, students continue their academic reading and writing skill development in Nonfiction Reading II and Academic Writing II courses. (NTID Reading Test score below 80 and NTID Writing Test score below 40) **Class 5, Credit 5 (F)**

0883-103

#### Integrated Reading and Writing II

This is the second course in a two-course developmental sequence in which students work on the reading and writing skills necessary for all degree programs at NTID. Students develop the English language knowledge, reading comprehension strategies and written language skills included in Nonfiction Reading I and Academic Writing I. Students also learn strategies for integrating the use of reading and writing. Upon successful completion of this two-course sequence, students continue their academic reading and writing skill development in Nonfiction Reading II and Academic Writing II courses. (NTID Reading Test score below 80, NTID Writing Test score below 40 and 0883-102) **Class 5, Credit 5 (W)**

#### Fundamental (Level B)

0883-161

#### Writing II

In this developmental course, students learn and practice the writing skills necessary to satisfy the requirements for a diploma or to enter Academic Writing III. They learn how to use personal experience and resource materials to develop and organize their thoughts on various topics. They organize and develop paragraphs and brief compositions of various discourse types, with particular emphasis on narration, description and process. They also learn how to revise and edit their texts and present them according to the conventions, format and mechanics expected by the discourse community for which they write. (NTID Writing Test score between 40 and 49 or 0883-101 or 0883-103; corequisite: 0883-398) **Class 4, Credit 4 (F, W, S)**

#### Intermediate (Level C)

0883-211

#### Writing III

In this developmental course, students learn and practice the writing skills necessary to satisfy the requirements for an AOS degree or to enter Academic Writing IV. They plan, draft, revise and edit short essays of various discourse types, such as exemplification and process. They learn how to organize and develop their texts for various topics and purposes and how to revise, edit and present them according to the conventions, format and mechanics expected by the discourse community for which they write. (NTID Writing Test Score between 50 and 59 or 0883-161) **Class 4, Credit 4 (F, W, S)**

#### Bridging (Level D)

0883-261

#### Writing IV

In this developmental course, students learn and practice the writing skills necessary for College of Liberal Arts writing courses. Students gather information from various sources, plan, draft, revise and edit longer essays (of at least 500 words) of various discourse types, with particular emphasis on description and exemplification. Students learn how to organize and develop their texts for various topics, purposes and audiences. Students also learn how to revise, edit and present texts according to the conventions, format and mechanics expected by the discourse community for which they write. (NTID Writing Test Score between 60 and 67 or grade C or higher in 0833-211) **Class 4, Credit 4 (F, W, S)**

### Nonfiction Reading

#### Introductory (Level A)

0883-100

#### Nonfiction Reading I

In this developmental course, students learn and practice the reading comprehension skills and English language skills necessary to increase comprehension of nonfiction reading materials necessary to begin degree programs at NTID. (NTID Reading Test score below 80) **Class 4, Credit 4 (F, W)**

#### Fundamental (Level B)

0883-160

#### Nonfiction Reading II

In this developmental course, students learn and practice the reading comprehension skills and English language skills necessary to increase their comprehension of nonfiction reading materials required for success in diploma programs at NTID. (NTID Reading Test score between 80 and 97 or 0883-100 Nonfiction Reading I or 0883-103 Integrated Reading and Writing, Part II; corequisite: 0883-399) **Class 4, Credit 4 (F, W, S)**

#### Intermediate (Level C)

0883-210

#### Nonfiction Reading III

In this developmental course, students learn and practice the reading comprehension skills and English language skills necessary to increase their comprehension of nonfiction reading materials required for success in associate of occupational studies (AOS) degree programs or to enter Nonfiction Reading IV. (NTID Reading Test score between 98 and 124 or 0883-160) **Class 4, Credit 4 (F, W, S)**

#### Bridging (Level D)

0883-260

#### Nonfiction Reading IV

In this developmental course, students learn and practice the reading comprehension skills and English language skills necessary to increase their comprehension of nonfiction reading materials required for success in AAS and higher degree programs at NTID and RIT. (NTID Reading Test score between 125 and 143 or grade C or higher in 0883-210) **Class 4, Credit 4 (F, W, S)**

### Literature

#### Fundamental (Level B)

0883-150

#### Exploration in Literature

In this developmental course, students are introduced to a variety of literary works (drama, poetry, short story/storytelling and novel or novel excerpts). Students learn basic literary terms and improve their critical reading skills in order to appreciate literature. The exploration and study of literature stimulates discussions of the relationships of literary works to one's own life. (ACT arts/literature reading score 1-4 or 0883-103 or permission of instructor) **Class 4, Credit 4 (F, W, S)**

#### Intermediate (Level C)

0883-200

#### Analyzing Literature

This course is for students who are familiar with basic literary analysis and are ready to identify, elucidate and discuss traditional literary elements. Instruction and practice will focus on elements such as theme, personal values, cultural diversity, tone and style. In addition, students will discuss the relevance of literary works to their own life experiences and search for identity. (ACT arts/literature reading score 5-7 or 0883-150 or permission of instructor) **Class 4, Credit 4 (F, W, S)**

#### Bridging (Level D)

0883-250

#### Themes and Symbols in Literature

Students with experience in literary analysis will apply their knowledge and ability to independently comprehend literary works in preparation for entry to College of Liberal Arts literature course work. Students will effectively report in writing the results of such activities as individual literary analyses, critiquing and research study. In addition, students will examine the multicultural voices and views expressed through literature. (ACT arts/literature reading score 8-9 or 0883-200 or permission of instructor) **Class 4, Credit 4 (F, W)**

0883-398

#### Special Topics - English

Credit variable (F, W, S)

0883-399

#### Independent Study - English

Credit variable (F, W, S)

## Humanities

The humanities distribution requirement can also be satisfied by completing courses in American Sign Language, communication studies, deaf studies, and performing arts. See courses listed under these headings. C-level courses satisfy the AOS requirement. Humanities courses may also satisfy the deaf studies/American Sign Language requirement as noted.

### Fundamental (Level B)

**0880-180 Perspectives on the Humanities**  
Familiarizes students with the basic concepts and terminology in the study of the humanities (literature, history, fine arts, performing arts and philosophy). Students learn about the nature of intellectual and academic inquiry and the questions asked in humanities disciplines. (ACT arts/literature reading score 1-4) **Class 3, Credit 3 (F, W)**

**0880-190 Introduction to Deaf Studies\***  
Introduces students to major concepts and issues in the field of deaf studies. The course integrates the fields of history, anthropology, linguistics, creative arts and literature as they apply to Deaf culture and the Deaf community. The course is designed to foster students' active participation as a means of developing strong leadership and advocacy skills among NTID students. After completing this course, students will be able to pursue specific areas of interest within the deaf studies/ASL program. (ACT arts/literature reading score 1-4 or permission of instructor). **Class 3, Credit 3 (F, W)**

### Intermediate (Level C)

**0880-230 The American Past: An Introduction to the History of the United States**  
Provides an overview of United States history beginning in 1607 and continuing through the 20th century. The course introduces students to issues, ideas and people influential in shaping our country's past. It focuses on major political, economic and social developments as well as contributions and perspectives of diverse cultural groups. The course increases students' knowledge of American history and prepares them for further history courses. (ACT arts/literature reading score 5-7 or 0880-180 or permission of instructor) **Class 3, Credit 3 (F)**

**0880-240 The Big Questions: An Introduction to Philosophy**  
Surveys the quest to understand humanity's place in the world and the significance of the human experience. Starting with the Greeks and sampling major contributions of the great philosophers, this course explores how and why the great questions were asked. (ACT arts/literature reading score 5-7 or 0880-180 or permission of instructor) **Class 3, Credit 3 (W, S)**

**0880-247 Deaf Art/Deaf Artists\***  
Examines art works and artists' statements, goals and intentions. The artwork and the statements of artists are examined to determine if the artists focus on being deaf as the subject of their art or if the focus of their art is related to Deaf issues or other subjects. By examining these connections and influences and comparing the varieties of choices artists have made, a definition of Deaf Art is developed. From the readings and reviews, students develop a list of issues that lead to identification of a person as a Deaf artist or an artist who is deaf. The question of what is culture and what is art is examined, and comparisons to cultural groups are made. An in-depth analysis of Deaf View/Image Art (De'VIA) will be conducted, and parallels will be drawn to other disenfranchised groups' artwork. Furthermore, students will create their own self-portrait using De'VIA themes and/or motifs. **Class 3, Credit 3 (F, S)**

### Bridging (Level D)

**0880-280 Issues Facing Citizens of the 21st Century**  
Citizens of the 21st century will face problems of worldwide proportions. Examples of such problems might include "global climate change" (GCC), overpopulation, destruction of tropical rain forests or world hunger. In this course, students study such issues from the perspectives of history, philosophy, religion/ethics and aesthetics in order to understand the problems more completely. In addition, students apply their own systems of values and beliefs and seek solutions that they can begin to implement within their own environments. (ACT arts/literature reading score 8-10 or permission of instructor) **Class 3, Credit 3 (S)**

## Laboratory Sciences Technology

**0879-200 Introduction to Laboratory Science Technology**  
This course introduces students to the laboratory science technology (LST) program's curriculum, content, entry requirements, graduation requirements and employment options. Topics will also include an introduction to historical and current issues in the field of laboratory testing, concepts of analytical testing, basic laboratory applications and fundamental technical skills used in the laboratory. **Class 1, Lab 2, Credit 2 (F)**

**0879-201 Laboratory Science Technology: Laboratory Applications I**  
This is the first of a six-course sequence that focuses on the application of laboratory tools, techniques and procedures. Each course builds on the knowledge and skills developed in previous laboratory applications courses. This introductory course establishes an expectation of high performance and introduces the concepts of lab protocols and standards. Course topics include laboratory safety, laboratory notebooks and information management, scientific reference and information sources, the identification and use of laboratory equipment and glassware, and maintaining a laboratory environment. This course integrates and reinforces information learned in previous and concurrent technical courses. Students begin to organize a laboratory science technology portfolio. (0879-200) **Class 1, Lab 2, Credit 2 (W)**

**0879-202 Laboratory Science Technology: Laboratory Applications II**  
This is the second of a six-course sequence that focuses on the application of laboratory tools, techniques and procedures. This course continues to reinforce an expectation of high performance and introduces concepts surrounding quality control. Course topics also include the analytical process, laboratory organizational set-up, chain-of-custody and record keeping and computer skills related to the field. This course integrates and reinforces information learned in previous and concurrent technical courses. A laboratory science technology portfolio will continue to be developed. (0879-201) **Class 1, Lab 2, Credit 2 (S)**

**0879-203 Laboratory Science Technology: Laboratory Applications III**  
This is the third of a six-course sequence that focuses on the application of laboratory tools, techniques and procedures. Course topics include regulations governing laboratory environments, following written technical procedures and monitoring and reporting as applied to the sampling, testing and disposal of substances. Students also synthesize information learned in previous and concurrent courses by participating in job-related simulations. A laboratory science technology portfolio will continue to be developed. (0879-202) **Class 1, Lab 2, Credit 2 (F)**

**0879-204 Laboratory Science Technology: Laboratory Applications IV**  
This is the fourth of a six-course sequence that focuses on the application of laboratory tools, techniques and procedures. Course topics include laboratory information management systems (LIMS), technical writing and the reporting and presentation of scientific information. Students also synthesize information learned in previous and concurrent courses by participating in job-related simulations. A laboratory science technology portfolio will continue to be developed. (0879-203) **Class 1, Lab 2, Credit 2 (W)**

**0879-205 Laboratory Science Technology: Lab Applications V**  
This is the fifth of a six-course sequence that focuses on the application of laboratory tools, techniques and procedures. Professional and ethical behavior standards in the science laboratory environment are central to this course. Qualities of valued team members and their contribution to the overall performance of the laboratory are introduced, practiced and critiqued. This course also serves as a final mechanism for co-op preparation. This course integrates and reinforces information learned in previous and concurrent technical courses. A laboratory science technology portfolio will continue to be developed. (0879-204) **Class 1, Lab 2, Credit 2 (S)**

**0879-206 Laboratory Science Technology: Lab Applications VI**  
This is the sixth of a six-course sequence that focuses on the application of laboratory tools, techniques and procedures. The goal of this course is to work on individual student needs related to the reinforcement of knowledge and skill areas identified in co-op evaluations as requiring more effort. This course integrates and reinforces information learned in previous and concurrent technical courses. Students finalize a laboratory science technology portfolio. (0879-205; corequisite: 0879-250) **Class 1, Lab 2, Credit 2 (F)**

\*This course satisfies the Deaf Studies/American Sign Language requirement.

**0879-218 Introduction to Laboratory Science Technology Microbiology**  
This general microbiology course includes basic concepts for the evaluation of bacteria, virus, fungi (molds and yeast), algae and protozoa. Students learn laboratory procedures in the collection of samples; selection of media; techniques in sterilization; asepsis; staining, cultural, microscopic, biochemical and molecular identification; and antimicrobial susceptibility. The students develop knowledge of the processes microorganisms are responsible for that are vital to our lives. (0885-215; corequisite: 0885-205) **Class 2, Lab 3, Credit 3 (W)**

**0879-241 Laboratory Science Technology Microbiology**  
This microbiology course focuses on concepts related to microorganisms common in the fields of laboratory science. The emphasis is on the major families of microorganisms that are important in food processing, preservation, distribution, utilization and public health. Students will study the organisms' roles in ecology, recycling and biogeochemical cycles and the testing procedures for microbes in water, air, soil, sewage and the pathogens that affect humans. Students will develop knowledge and skills in the collection of samples, identification procedures and in understanding the laws related to public health and sanitation. (0885-205; 0879-218; corequisite: 0885-206) **Class 3, Lab 3, Credit 4 (S)**

**0879-250 Laboratory Science Technology: Senior Seminar**  
This course provides a forum in which peers, faculty and professionals discuss current topics and careers in the field of laboratory testing. Students also have an opportunity to synthesize their cooperative work experience with previous course experiences. Additional topics include communications, literature sources in the field and the importance of professional societies and federal/state/local agencies. (0879-299) **Class 2, Credit 2 (F)**

**0879-280 Sampling and Testing Soils and Groundwater**  
Students begin to learn about soil and groundwater and how it is contaminated. Content includes vocabulary, origin, identification, classification, characteristics, and methods for sampling and testing. Students use standard references and classifications. (0879-321 or 0879-311) **Class 3, Lab 3, Credit 4 (F, S)**

**0879-299 Co-op: Laboratory Science Technology**  
This 10-week, full-time experience gives students matriculated in the laboratory science technology (LST) program a practical sampling of working in the laboratory testing field. Students will work under the supervision of qualified professionals, performing a variety of tasks pertaining to the field. As part of this experience, students complete a student evaluation form. This experience must be satisfactorily completed before graduation. **Credit 0 (Su)**

**0879-301 Instrumentation I**  
In this course students learn and apply basic concepts and principles of analytical testing using laboratory instruments, instrumentation theory and procedures. Concepts surrounding spectroscopy and electroanalytical methods of analysis are presented. Techniques including sample preparation, instrumentation set-up and maintenance, calibration, precision measurement, safety, and data collection and analysis are introduced. Selected instrumentation presented in this course includes analytical balances, electroanalytical meters and probes, and atomic and molecular spectrophotometers. (0879-202, 0885-206, 0884-231) **Class 2, Lab 3, Credit 3 (F)**

**0879-302 Instrumentation II**  
In this course students learn and apply advanced concepts and principles in analytical testing using sophisticated laboratory instruments, instrumentation theory and procedures. Concepts surrounding chromatography methods of analysis are presented. Techniques including sample preparation, instrumentation set-up and maintenance, calibration, precision measurement, safety, and data collection and analysis are introduced. Selected instrumentation presented in this course includes liquid and gas chromatography, mass spectrometry and electrophoresis. (0879-301, 0879-203, 0885-291, 0884-232) **Class 2, Lab 3, Credit 3 (W)**

**0879-303 Instrumentation III**  
In this course students learn and apply advanced concepts and principles in analytical testing using sophisticated laboratory instruments, instrumentation theory and procedures. Concepts related to advanced and automated methods of instrumental analysis are presented. Techniques including sample preparation, instrumentation set-up and maintenance, calibration, precision measurement, safety, and data collection and analysis are introduced and reinforced. Selected procedures presented in this course include advanced techniques in atomic and molecular spectroscopy, liquid and gas chromatography, mass spectrometry, and automated and computer-based instrumentation. (0879-302, 0879-204, 0885-292) **Class 3, Lab 3, Credit 4 (W)**

**0879-311 Food Laboratory Science I**  
This course prepares students to follow standard protocols to perform laboratory procedures commonly used in the food industry. Product analysis includes testing for protein and moisture. Emphasis is on precise and accurate data collection, data analysis and presentation, and practicing laboratory information management systems (LIMS). Federal regulations governing the food industry are examined and applied. Additional topics related to prepared foods and food additives are presented. (0879-301, 0885-291, 0884-231) **Class 3, Lab 3, Credit 4 (W)**

**0879-313 Chemical Technology**  
This course prepares students to perform industry-specific applications of chemical analysis. Standard methods, operating procedures and protocols are introduced and reinforced. Sampling, testing and reporting in the fields of environmental, industrial, forensic, pharmaceutical and food testing are covered. Instrumental, volumetric and gravimetric techniques are practiced as they relate to the fields of chemical technology. (0879-203, 301, 0885-291, 0884-232, or permission of department) **Class 3, Lab 3, Credit 4 (W)**

**0879-314 Biotechnology**  
This course prepares students to perform biotechnical applications in industry-specific fields of analysis. Standard methods, operating procedures and protocols are introduced and reinforced. Sampling, testing and reporting in the field of biotechnology are covered. (0885-215, 0879-218, 0885-292, 0879-204, 0879-302, or permission of department) **Class 3, Lab 3, Credit 4 (S)**

**0879-321 Environmental Laboratory Science I**  
This course prepares students to follow standard protocols to perform laboratory procedures commonly used in environmental laboratories. Standard sampling and testing methods are introduced and practiced; e.g., gravimetric analysis, pH applications and chemical analysis using spectrophotometry. Emphasis is on precise and accurate data collection, data analysis and presentation, and practicing laboratory information management systems (LIMS). Federal regulations governing sampling and testing procedures are examined and applied. Additional topics related to quality control schemes, regulatory protocols and protocols governing sample collection are presented. (0879-301, 0885-291, 0884-232) **Class 3, Lab 3, Credit 4 (W)**

**0879-322 Environmental Laboratory Science II**  
This course prepares students to follow standard protocols to perform laboratory procedures commonly used in environmental laboratories. A continuation of standard sampling and testing methods are presented and practiced; e.g., chemical analysis using atomic absorption, chromatography techniques and mass spectrometry. Emphasis is on precise and accurate data collection, data analysis and presentation, and practicing laboratory information management systems (LIMS). Federal regulations governing sampling and testing procedures are examined and applied. Additional topics related to quality control schemes, regulatory protocols and protocols governing sample collection are presented. (0879-302, 321, 0885-212) **Class 3, Lab 3, Credit 4 (S)**

**0879-341 Applied Microbiology**  
This course builds on concepts of microbiology in the fields of laboratory science with an emphasis on food-borne pathogens and environmental pathogens in water, air and soil and current methods for detecting, isolating and identifying microorganisms. Students study food and industrial fermentation with a focus on biotechnology and genetic engineering as it applies to agriculture, manufacture of food ingredients and bioremediation or decomposition of materials and pollution. Students develop knowledge and skills in the technology and instrumentation used in testing laboratories and in industrial applications according to the standards set by the regulating agencies. (0879-241, 0879-321 or 0879-311, 0879-303) **Class 3, Lab 3, Credit 4 (F)**

**0879-398 Special Topics - Laboratory Science Technology**  
**Credit variable (F, W, S)**

\*This course satisfies the Deaf Studies/American Sign Language requirement.

†This course satisfies the humanities requirement.

## Mathematics

### Introductory (Level A)

**0884-100 Introduction to College Math**  
Improves students' fundamental understanding and skills in mathematics. Topics covered emphasize the use of language as it relates to basic mathematical computations. The use of calculators is stressed. **Class 4, Credit 3 (F)**

**0884-120 Preparation for Algebra**  
This course is designed for students with no significant algebra experience. Topics include signed numbers, an introduction to variables and modeling, work with solving simple equations, introductions to the coordinate plane, and interpreting and displaying data. Estimation, calculator use and language are emphasized and problem solving stressed. (0884-100 or equivalent) **Class/Lab 5, Credit 4 (F, W)**

### Fundamental (Level B)

**0884-150 Concepts of Measurement**  
Explores the mathematical concepts involving linear measurement, proportion and percent through the use of examples from printing, photo/media and applied art. (0884-100 or equivalent) **Class 4, Credit 3 (F, W)**

**0884-170 Elements of Geometry**  
This course is designed for students with no significant geometry experience. Topics include geometric classification and construction, angle mensuration, area computation, the circle and its parts, similar triangles and an introduction to trigonometry. Calculator use, estimation and language are emphasized. (0884-180 or equivalent) **Class 3, Lab 2, Credit 4 (W)**

**0884-180 Foundations of Algebra**  
Introductory algebra course consisting of a lecture and a lab component in which the basics of evaluating algebraic expressions, solving linear equations and inequalities and graphing linear functions are studied. Technology, in particular the graphing calculator, is an integral part of the learning and problem solving in this course. (0884-120 or equivalent) **Class 3, Lab 2, Credit 4 (F, W, S)**

**0884-185 Fundamental Geometry**  
This course is designed for students with no significant geometry experience and for students desiring a quick review of basic geometric concepts. Topics include geometric classification, angle mensuration, similar triangles and an introduction to right-triangle trigonometry. Calculator use, estimation and problem solving are emphasized. Students may not take both 0884-185 and 0884-170 for credit. (0884-180 or equivalent) **Class 1, Credit 1 (F, W, S)**

### Intermediate (Level C)

**0884-205 Trigonometry for Coordinate Analysis I**  
Students will study right-angle trigonometry with an emphasis on concepts and applications related to computer integrated machining technology (CIMT) and computer aided drafting technology (CADT). Topics include Pythagorean Theorem, trigonometric ratios in right triangles, coordinate geometry calculations, circle properties, tapers and bevels, V-blocks, dovetails and angle cuts. Development of numerical and geometric estimation and interpretation of visual data is emphasized. (0884-180 and either 0884-170 or 0884-185 or permission of department) **Class 2, Lab 2, Credit 3 (S)**

**0884-206 Trigonometry for Coordinate Analysis II**  
This course is a continuation of Trigonometry for Coordinate Analysis I and continues the development of problem solving using right-angle trigonometry with an emphasis on concepts and applications related to computer integrated machining technology (CIMT). Topics include complex machine applications, compound angles, slots and pockets, irregular-shaped grooves, Law of Sines, Law of Cosines, and 3-D coordinate geometry. (0884-205 or permission of department) **Class 2, Lab 2, Credit 3 (F)**

**0884-210 Applications of Algebra**  
An intermediate algebra course consisting of a lecture and a lab component in which exponents, rational expressions, polynomials, roots and radicals, and non-linear functions are studied. Technology, in particular the graphing calculator, is an integral part of the learning and problem solving in this course. Students may not take both 0884-210 and 0884-212 for credit without permission of the department. (0884-180 or equivalent) **Class 3, Lab 2, Credit 4 (F, W, S)**

**0884-212 Integrated Algebra**  
An intermediate algebra course consisting of a lecture and a lab component in which non-linear functions and graphs, systems of linear equations, exponents, polynomials, roots, radicals, and properties of the complex numbers are considered. There is significant emphasis on scientific and geometric models as well as the use of a variety of graphing utilities. Integrated algebra is recommended for students enrolled in applied computer technology, lab science technology, computer aided drafting technology and automation technologies programs as well as for students preparing for baccalaureate programs in science, engineering and computer-related fields. Fundamental Geometry (0884-185) is a corequisite for students expecting to advance to Elements of Trigonometry (0884-220) unless the mathematics placement process indicates the corequisite can be waived. Students may not take both 0884-210 and 0884-212 for credit without permission of the department. (0880-180) **Class 3, Lab 2, Credit 4 (F, W, S)**

**0884-220 Elements of Trigonometry**  
This course includes topics from trigonometry with an emphasis on the study of right and oblique triangles, rotational angles, trigonometric functions and their graphs. An introduction to trigonometric identities is also provided. (0884-185, 212 or permission of department) **Class 3, Lab 2, Credit 4 (F, W, S)**

**0884-231 Laboratory Mathematics I**  
This course addresses classic laboratory calculations and elementary descriptive statistics in the context of modern information technology and computing power. Use of hand-held calculators and computer spreadsheet software to exchange, analyze and chart electronically-stored data is a central focus. Study is closely coordinated with work in associated technical courses. Application areas encountered in this course may include basic gas laws, preparation and dilution of solutions, and analysis of chemical composition. (0884-212 or permission of department) **Class 2, Lab 2, Credit 3 (S)**

**0884-232 Laboratory Mathematics II**  
This course continues study of computations relating to laboratory procedures in the context of modern information technology and computing power. Emphasis is on the capture and analysis of realistic laboratory data and the preparation of formal reports. Topics studied include the use of statistical procedures in quality control. (0884-231) **Class 2, Lab 2, Credit 3 (F)**

### Bridging (Level D)

**0884-250 Preparation for Statistics**  
An introductory statistics course consisting of a lecture and a lab component in which statistics concepts, elements of probability and probability distributions, and bivariate data are studied. The course emphasizes number sense and algebraic concepts as they relate to statistics and probability. Technology, in particular the graphing calculator, is an integral part of the learning and problem solving in this course. (0884-210 or equivalent) **Class 3, Lab 2, Credit 4 (S)**

**0884-260 Explorations in College Algebra**  
Students will study topics from algebra with an emphasis on functions and graphs. Topics include the algebra of functions and the study of inverse functions. Rational, radical, exponential and logarithmic functions and systems of linear equations are also studied. Exploration of mathematical concepts through use of a graphing calculator is an integral feature of the course. Students may not take both 0884-260 and 0884-275 for credit without permission of the department. (0884-210 or permission of department) **Class 4, Credit 4 (W, S)**

\*This course satisfies the deaf studies/American Sign Language requirement.

†This course satisfies the humanities requirement.

**0884-275** **Advanced Mathematics**  
Topics from precalculus mathematics are studied with an emphasis on functions and graphs. Topics include the algebra of functions and the study of inverse functions. Exploration of mathematical concepts through the use of a graphing calculator is an integral feature of the course. Students may not take both 0884-260 and 0884-275 for credit without permission of the department. (0884-212 and 0884-220 or equivalent or permission of the department) **Class 4, Credit 4 (F, W, S)**

**0884-290** **Concepts of Calculus**  
Explores topics traditionally encountered in a first calculus course. Limits, continuity and the derived function are studied. A graphing calculator is used extensively to develop concepts and to aid in problem solving. (0884-275 or permission of the department) **Class 4, Credit 4 (F)**

**0884-398** **Special Topics - Mathematics**  
**Credit variable (F, W, S)**

**0884-399** **Independent Study - Mathematics**  
**Credit variable (F, W, S)**

## Performing Arts

### Fundamental (Level B)

**0881-166** **Sign Mime and Creative Movement\***  
Focuses on the dominant historical form of expression used by theaters of the Deaf. Topics include principles for effective use of space, creative movement strategies and expression of original ideas in sign-mime. This course satisfies the deaf studies/ASL requirement. (ACT arts/literature reading score 1-4 or permission of instructor) **Class 3, Credit 3 (F, W)**

**0881-167** **Dance Performance**  
Provides an introduction to dance that gives students access to the language as well as the fundamental movements of dance. The styles and technique of Martha Graham (contraction) and José Limon (fall and rebound) are explored. Ensemble work, performance standards and creation of character and theme are stressed. This course counts as one course towards the wellness activity graduation requirement. (ACT arts/literature reading score 1-4 or permission of instructor) **Class 3, Credit 3 (W)**

**0881-168** **Jazz**  
Provides students with a wider range of dance vocabulary, which is created from ballet, modern dance and ethnic dance traditions. The styles of Bob Fosse and the fall and rebound style of José Limon are a basis for this course. This course counts as one course towards the wellness activity graduation requirement. (ACT arts/literature reading score 1-4 or permission of instructor) **Class 3, Credit 3 (F, S)**

### Intermediate (Level C)

**0881-202** **History of Theater†**  
Examines theater from its early origins in primitive societies to contemporary types of theater and issues in dramatic presentation. The role of theater in society and in a variety of cultures is examined with particular attention to the role of deaf performers, directors and play creators in specific historical periods. (ACT arts/literature reading score 5-7 or permission of instructor) **Class 3, Credit 3 (W)**

**0881-204** **Deaf Theater History\*†**  
Examines the Deaf experience in theater and the roles that deaf people have played in theater history. Particular attention is given to the documented achievements of individuals and companies in the 19th and 20th centuries. This course satisfies the deaf studies requirement. (ACT arts/literature reading score 5-7 or permission of instructor; 0881-202 or 0882-221) **Class 3, Credit 3 (W)**

**0881-210** **Acting I†**  
Covers fundamental vocabulary for developing the actor's craft, process and technique. The vocabulary is Stanislavsky-based and explored through improvisation and simple monologue work. This course is crucial for character development, which is the core of Acting II. (ACT arts/literature reading score 5-7 or permission of instructor) **Class 3, Credit 3 (F, W)**

**0881-217** **Stage Combat†**  
Explores fundamentals of safe stage combat historically, analytically and physically. Focus is on physical scene work related to hand-to-hand combat, with some stage fencing. Falls, tumbling, punches, kicks and the eight basic positions for single rapier engagement are included. A final scene is created from classroom vocabulary and evaluated as part of the final exam. This course counts as one course towards the wellness activity graduation requirement. (ACT arts/literature reading score 5-7 or permission of instructor) **Class 3, Credit 3 (offered biennially)**

**0881-218** **Dance History†**  
Examines early examples of dance in Western and non-Western societies, initially as a form of religious and dramatic expression. Development of ethnic styles; formalization of ballet in France, England and Russia; the evolution of modern dance; and the role of dance in visual theater are explored. (ACT arts/literature reading score 5-7 or permission of instructor) **Class 3, Credit 3 (S)**

**0881-222** **Scenic Technology I†**  
Provides hands-on exploration of basic construction techniques utilized in theater productions. Students gain an understanding of scenic construction methods and technology as well as the safe and proper use of equipment. Readings on the production process and formal critiques are also required. (ACT arts/literature reading score 5-7 or permission of instructor) **Class 3, Credit 3 (W, S)**

**0881-223** **Scenic Technology II†**  
This project-oriented class focuses on methods, materials, rigging and props. Students use and apply the skills learned in Scenic Technology I to individual projects. The course allows students the opportunity to work with more advanced materials. This course prepares students for more specialized work in the theater practicum. (ACT arts/literature reading score 5-7 or permission of instructor; 0881-222) **Class 3, Credit 3 (W, S)**

**0881-224** **Scene Painting†**  
Provides an introduction to the craft of scene painting. Techniques, communication with designers and use of appropriate materials and tools are emphasized. (ACT arts/literature reading score 5-7 or permission of instructor) **Class 3, Credit 3 (F, W, S)**

**0881-231** **Costume Technology I†**  
Provides hands-on exploration of basic costume techniques utilized in theater. Students gain an understanding of costume construction techniques, research and terminology as well as the role of the costume shop in the production process. (ACT arts/literature reading score 5-7 or permission of instructor) **Class 3, Credit 3 (W)**

**0881-232** **Costume Technology II†**  
Advanced course in costume construction develops students' sewing skills, problem solving and knowledge of costume history. The course prepares students for design courses, application of skills to a historical garment and costume assistantship through theater practicum. (ACT arts/literature reading score 5-7 or permission of instructor; 0881-231) **Class 3, Credit 3 (W)**

**0881-233** **Stage Make-up†**  
Introductory course explores basic stage make-up techniques (e.g., corrective, aging, gender change, scarring, bruising, and fantasy). Student designers and actors learn through demonstration and hands-on experience. The course prepares students for theater practicum and running crew. (ACT arts/literature reading score 5-7 or permission of instructor) **Class 3, Credit 3 (F, S)**

**0881-241** **Lighting Technology I†**  
Teaches the basic understanding of lighting software, equipment and practices that are utilized in theater production. This course prepares students for supervised practicum experience. (ACT arts/literature reading score 5-7 or permission of instructor) **Class 3, Credit 3 (F, W)**

**0881-242** **Lighting Technology II†**  
Introduces the student to the mechanics and guidelines of lighting design. The structure of this course is designed to take the student through the step-by-step process of building a solid design foundation prerequisite to all lighting design application. (ACT arts/literature reading score 5-7 or permission of instructor; 0881-241 or permission of instructor) **Class 3, Credit 3 (W)**

†This course satisfies the humanities requirement.

## **Bridging (Level D)**

**0881-250**

### **Introduction to Performing Arts†**

Studies the characteristics and elements of theater/performing arts, emphasizing the principles that have guided theater productions through history. The course examines the ways that theater influences and is influenced by cultures and by individual life experience. Particular attention is paid to the development of performing arts by and for deaf persons. This course satisfies part of the humanities requirement. (ACT arts/literature reading score 8-10 or permission of instructor) **Class 3, Credit 3 (F, W)**

**0881-253**

### **Arts Management†**

Addresses the skills required to manage artistic/theatrical projects and programs while maintaining artistic vision. Topics include the relationship of art and management, communication skills, fundraising in private and public sectors, and marketing strategies. (ACT arts/ literature reading score 8-10 or permission of instructor) **Class 3, Credit 3 (offered biennially)**

**0881-256**

### **Script Analysis†**

Explores the prominent questions an actor/dancer/designer must research before and during the time a text can develop into playable action. The course uses texts from world literature, American Sign Language literature and dance choreography. Particular attention is paid to the physical, emotional and mental actions a character reveals to his/her audience. (ACT arts/literature reading score 8-10 or permission of instructor) **Class 3, Credit 3 (S)**

**0881-257**

### **Introduction to Dramatic Literature†**

Introduces students to the play script as literature, genres of dramatic literature, critical periods in the development of dramatic literature and the use of analytical literary vocabulary. (ACT arts/literature reading score 8-10 or permission of instructor) **Class 3, Credit 3 (W)**

**0881-258**

### **Introduction to Play Creating†**

Uses a workshop approach to explore what being a playwright/play creator means. Class topics include exploring each writer's values and points of view, bringing those viewpoints to life on the stage, developing rounded characters, structuring action, creating dialogue and taking a play through workshop critique. The goals of the course for each student are to develop a more finely tuned theatrical sensitivity and to have a playable scene, act, or one-act play by the end of the quarter. These plays may be scripted in English, American Sign Language or visual theater systems. (ACT arts/ literature score 8-10 or permission of instructor) **Class 3, Credit 3 (S)**

**0881-259**

### **Creative Translation for Stage\*†**

Focuses on different translation forms used by theater, mime and dance companies. Students learn to distinguish between English and American Sign Language (ASL). They translate stories, poems and plays into ASL and other sign languages. Theatrical integrity dealing with translation issues and visual access is a central goal. (ACT arts/literature reading score 8-10 or permission of instructor; 0881-210 or 0881-256) **Class 3, Credit 3 (S)**

**0881-260**

### **Acting II†**

Covers vocabulary for developing the actor's craft, process and technique related to basic scene-study and character development. The work is Stanislavsky-based. Improvisation and scene work focus on characterization and engaging conflict. (ACT arts/literature reading score 8-10 or permission of instructor; 0881-210 or audition with instructor) **Class 3, Credit 3 (W, S)**

**0881-261**

### **Audition Technique†**

Emphasizes preparation for career research. Major topics include interviewing, portfolio, résumé, photo selection, monologue repertoire development and cold reading. (ACT arts/literature reading score 8-10 or permission of instructor; 0881-210, 260 or permission of instructor) **Class 3, Credit 3 (offered biennially)**

**0881-266**

### **Ballet†**

Introduces the art of ballet, its vocabulary (French, Sign and English), discipline base, protocols and specific movements. Students are introduced to key concepts through lecture demonstration; video; and floor, center and barre work. This course counts as one course towards the wellness activity graduation requirement. (ACT arts/literature reading score 8-10 or permission of instructor) **Class 3, Credit 3 (F)**

**0881-267**

### **Fundamentals of Choreography†**

This course explores the freedom and discipline that balance the art of choreography. Visualization and notation systems are studied. Students are required to both choreograph for student ensembles and perform in original works of other students in the class. (ACT arts/literature reading score 8-10 or permission of instructor; 0881-218, 266 or permission of instructor) **Class 3, Credit 3 (W)**

**0881-272**

### **Stage Management†**

Advanced course designed to train stage managers. Leadership and organizational skills are developed in relation to rehearsal schedules, production meetings and performance. Projects include setting up and understanding the use of the stage manager's prompt book. The course also addresses the protocols of dealing with designers, actors, directors and crew members as well as the rehearsal process and calling the cues for the run of the show. This is a required course for stage managing any of the college's/department's main stage shows. (ACT arts/literature reading score 8-10 or permission of instructor) **Class 3, Credit 3 (W, offered biennially)**

**0881-298**

### **Theater Practicum†**

Applies technical, performing, script analysis, stage management and other skills to an actual production. Students contract with a faculty mentor for responsibilities and the appropriate credit expectations. **Class 1-6, Credit 1-6 (F, W, S)**

**0881-398**

### **Special Topics - Performing Arts**

**Credit variable (F, W, S)**

**0881-399**

### **Independent Study - Performing Arts**

**Credit variable (F, W, S)**

## **Pre-baccalaureate Studies**

**0853-200**

### **Freshman Seminar**

Provides entering pre-baccalaureate and baccalaureate students with opportunities to enhance academic, personal and social skills needed for success in the mainstream college environment. Students have opportunities to explore and negotiate the college environment, learn how to effectively use support services, confront questions of identity and social role, and establish relationships with faculty and students in their program. Emphasizes integration into the academic and social systems of both the NTID community and the mainstream college environment. **Class 3, Credit 2 (F)**

**0853-399**

### **Independent Study - Science/Engineering Support**

This course is designed to help students evaluate their strengths and weaknesses and to improve their learning efficiency and effectiveness through training in the application of appropriate learning strategies. Students have the opportunity to improve their learning skills in time management and test taking. Activities include individual conferences based on instruction presented through online interactive materials and a workbook. **Class variable, Credit variable (W, S)**

## **Science**

### **Fundamental (Level B)**

**0885-151**

### **Processes of Science: Astronomy**

Covers introductory science processes using the content of astronomy as a vehicle to establish an appreciation of the scientific method, critical thinking and problem solving. The basic processes of observing, classifying, comparing and measuring using metric units are addressed in both class and laboratory using the concepts of astronomy. **Class 2, Lab 2, Credit 3 (S)**

**0885-153**

### **Processes of Science: Environmental Studies**

Covers introductory science processes using the content of environmental studies as a vehicle to establish an appreciation of the scientific method, critical thinking and problem solving. The basic processes of observing, classifying, comparing and measuring using metric units are addressed in both class and laboratory using the concepts of environmental studies. **Class 2, Lab 2, Credit 3 (F, W)**

**0885-154**

### **Processes of Science: Physics of Matter**

This course focuses on introductory science processes using the content of physical properties of matter as a vehicle to establish an appreciation of the processes of science. The basic processes of observing, collecting data, classifying, comparing, analyzing and forming hypotheses will be addressed using the concepts of physics. (0884-180 or equivalent) **Class 2, Lab 2, Credit 3 (F, W)**

†This course satisfies the humanities requirement.



**0885-155** **Processes of Science: Biological Studies**  
This course focuses on introductory science processes using the content of biological studies as a vehicle to establish an appreciation of the processes of science. The basic processes of observing, collecting data, classifying, comparing, analyzing and forming hypotheses will be addressed using the concepts of biology. Students will investigate microorganisms, metabolism, nutrition, physiology and embryology and prepare laboratory reports with appropriate detail and accuracy. **Class 2, Lab 2, Credit 3 (F, W)**

**0885-156** **Processes of Science: Forensics**  
This course focuses on introductory science processes using the content of forensic studies as a vehicle to establish an appreciation of the processes of science. The basic processes of observing, collecting data, classifying, comparing, analyzing and forming hypotheses will be addressed using the concepts of forensics. Students will analyze crime scenes, perform tests on blood, fingerprints, chemicals and DNA and prepare laboratory reports with appropriate detail and accuracy. **Class 2, Lab 2, Credit 3 (F, W)**

### **Intermediate (Level C)**

**0885-200** **Applied Optical Physics**  
Studies light, reflection and refraction. These principles are applied to the study of the behavior of spherical and plano mirrors, prisms and lenses. The usefulness and application of dioptic power, the lens maker's equation, image and object dimensions and focal-length measurements are addressed. Also included is study of the electromagnetic spectrum. Emphasis is on geometrical (ray) optics. Includes a comprehensive laboratory experience that supplements and closely follows classroom instruction. (0884-180 and either 0884-170 or 185 or permission of department) **Class 4, Lab 1, Credit 4 (W)**

**0885-201** **Physics I**  
Physics I is designed to provide a broad background in general physics. Required for students entering NTID engineering technology programs. Students are provided with hands-on laboratory experience in a supervised setting. Topics, which are presented in a lecture/lab format, include kinematics and dynamics, Newton's Laws of Motion, forces, analysis of vectors. (Permission of department) **Class 4, Lab 1, Credit 4 (W, S)**

**0885-205** **Fundamentals of Chemistry I**  
This course is an introduction to the fundamental theories and principles of chemistry governing the structure and behavior of matter at the atomic and molecular levels. The language of chemistry, including nomenclature, chemical reactions and equations, is introduced as well as the computational strategies used in chemistry. Basic laboratory skills and techniques are used to investigate chemical components. Activities focus on precision and accuracy in the collection of data. Chemical hygiene and safety procedures in the laboratory are emphasized. **Class 3, Lab 3, Credit 4 (W)**

**0885-206** **Fundamentals of Chemistry II**  
This course is the continuation of an introduction to the fundamental theories and principles of chemistry governing the structure and behavior of matter at the atomic and molecular levels. Topics include stoichiometry, solution chemistry, electrolytes, acid/base and redox theories. Computational and laboratory skills and techniques related to solution chemistry, including application in concentration expressions, acid/base and redox, are presented. Activities focus on precision and accuracy in the collection of data and sample tracking. Chemical hygiene and safety procedures in the laboratory are emphasized. **Class 3, Lab 3, Credit 4 (W)**

**0885-215** **Fundamentals of Cellular Biology**  
This course provides students with the fundamentals of cellular biology on the molecular level. Principles governing chemical components of cells, cellular processes and molecular genetics are introduced. Methods used to record and present data and write formal lab reports are emphasized. Laboratory activities complement classroom activities. **Class 3, Lab 3, Credit 4 (F)**

**0885-216** **Fundamentals of Human Biology**  
Provides students with the fundamentals of human biology, beginning with organization at the tissue level. Body systems and their interrelationships are presented on a structural, functional and homeostatic level. Skills necessary for success in future science courses will be emphasized. Laboratory activities, including the use of prepared specimens, complement classroom activities. (0885-215) **Class 3, Lab 3, Credit 4 (W)**

### **Bridging (Level D)**

**0885-251** **Biological Concepts I**  
Develops and/or enhances knowledge and skills necessary for success in a college-level general biology course. Themes include chemistry in living systems, movement through membranes, macromolecules, metabolism and enzymes. Laboratory activities complement each theme. (Permission of instructor) **Class 3, Lab 3, Credit 4 (F, S)**

**0885-252** **Biological Concepts II**  
Develops and/or enhances knowledge and skills necessary for success in a college-level general biology course. Themes include molecular genetics, microevolution, cell functions, cell nutrition and regulation of homeostasis. Laboratory activities complement each theme. Successful completion of Biological Concepts I is suggested but not required. (0885-251 or permission of instructor) **Class 3, Lab 3, Credit 4 (W)**

**0885-281** **Human Genetics and Evolution**  
Introduces basic human genetics, basic human evolution and the relationship between 21st century discoveries in genetics and current human evolution dogma. The history of scientific discovery in both fields is paired with a study of current concepts in molecular biology, and bridges between genetics and evolution are explored. This presentation/discussion/laboratory course includes topics in human reproductive history, cytology, embryology, molecular biology of the gene, the origin of life, human origins, heredity, genetic variations, population genetics, biotechnology, and Old World and New World evolutionary theory. (Permission of instructor) **Class 3, Lab 3, Credit 4 (F)**

**0885-282** **Scientific Basis of Social Responsibility**  
Interactive course designed to provide students with both tools and confidence to become more literate in the sciences. Students select and analyze contemporary social issues and/or problems with a basis in science utilizing basic processes of scientific inquiry. Sample topics include the following: infectious disease processes; traditional vs. alternative medicine; biogenetics; lifestyle; euthanasia; environmental resources and management; world population trends; and stem cell research. Following a definition of the issue/problem, students formulate research questions and share their collective findings. They then complete weekly topic summaries that articulate their positions. Topic-related laboratory exercises and community interactions provide hands-on lab opportunities to experience contemporary science and technology. (Permission of instructor) **Class 3, Lab 3, Credit 4 (S)**

**0885-283** **Developmental Human Anatomy and Physiology**  
Introduces basic human development and maturation from a multidisciplinary perspective. In this course, the fields of human anatomy and physiology are merged with developmental psychology for the purpose of examining the human life cycle from a holistic perspective. Changes that take place in the structure and function of the human body are studied over nine stages of the human life span. Concurrently, psychological and cognitive development are discussed, beginning with conception and ending with death processes. (Permission of instructor) **Class 3, Lab 3, Credit 4 (W)**

**0885-291** **Principles of Analytical Chemistry**  
This course introduces quantitative analysis utilizing both gravimetric and volumetric techniques. Topics include the evaluation of analytical data, gravimetric analysis, acid/base and redox titrations. Chemical hygiene and safety procedures in the laboratory are emphasized. (0885-206 or equivalent, 0884-231) **Class 3, Lab 3, Credit 4 (F)**

**0885-292** **Principles of Organic Chemistry**  
This course provides an introduction to the principles of organic chemistry. Topics include structure, nomenclature and properties of organic molecules. Concepts surrounding carbon chemistry and bonding, functional groups and polymers are also presented. Investigations involving data collection and qualitative and quantitative analyses provide a framework for laboratory activities. Chemical hygiene and safety procedures in the laboratory are emphasized. (0885-205 or equivalent, 0884-231) **Class 3, Lab 3, Credit 4 (W)**

**0885-398** **Special Topics - Science**  
**Credit variable (F, W, S)**

**0885-399** **Independent Study - Science**  
**Credit variable (F, W, S)**

## Social Sciences

The social sciences distribution requirement can also be satisfied by completing courses in communication studies. See courses listed under this heading. C-level courses satisfy the AOS requirement. Social sciences courses may also satisfy the deaf studies/American Sign Language requirement as noted.

### Fundamental (Level B)

**0882-150 Making a Difference: A Social Science Perspective**  
Explores some of the core concepts found in the social sciences. These core concepts are taught by using biographical sketches of individuals who have made a difference with their lives: for example, Simon Wiesenthal, Mother Teresa, Helen Keller, Martin Luther King Jr. and Jackie Robinson. (ACT social studies/science reading score 1-5) **Class 3, Credit 3 (F, W, S)**

### Intermediate (Level C)

**0882-200 Introduction to Social Sciences**  
This course is intended to explore the understanding of human behavior and everyday life using important concepts from social sciences. This course covers the fields of psychology, sociology and political science. Materials from anthropology and economics may be used as well. The course focuses on the application of the social sciences to the study of business, art, education, government and other areas of interest. (ACT social studies/science reading score 6-8 or 0882-150) **Class 3, Credit 3 (F, W, S)**

**0882-205 American Family in Crisis**  
Studies contemporary social problems that influence the individual and family at different stages in the human life cycle. The course begins with the topic of child abuse and child neglect and moves to the study of problems often encountered by teens in their search for identity. The final portion of the course deals with the topic of divorce and its implications for adults and children. (0882-200 or permission of instructor) **Class 3, Credit 3 (F, W, S)**

**0882-210 The Black Experience**  
This course helps students pursuing an AOS, AAS, or BS degree gain an understanding of the experiences of black people in America. This course offers a historical perspective of black people from their origins in Africa to their settlement in America. This perspective includes the period of slavery, the reconstruction period, the civil rights struggle and modern race relations among black people (hearing and deaf) and other groups in America. (0882-200 or permission of instructor) **Class 3, Credit 3 (S)**

**0882-215 Current Social Problems**  
Studies social issues that impact individuals who live in the United States and Canada. Important issues covered include cultural pluralism, the inequity among various ethnic and racial groups, and public and political policies. These social issues are related to the global environment, health care and family. Special consideration is given to how these issues impact the Deaf community. (0882-200 or permission of instructor) **Class 3, Credit 3 (W, S)**

**0882-221 Deaf Heritage\***  
The course will examine the lives of deaf people throughout history, particularly during critical events such as revolutions, wars, the Great Depression, and into the modern era with legislative acts that have led to significant changes in education and employment. Simultaneously, the formation of the Deaf community and Deaf culture will be studied to illustrate the meaning of "Deaf heritage." Hard-of-hearing and late-deafened individuals involved in the Deaf community will be included, and racial, ethnic and gender issues will be discussed as they relate to this heritage. Students learn how technology has impacted the lives of Deaf people, as have local, state and national organizations of the Deaf. The achievements of many deaf people in a variety of fields will underscore self-identity and self-advocacy issues. (0882-200) **Class 3, Credit 3 (F, W, S)**

**0882-222 Deaf Culture and Community\***  
Introduces students to aspects of Deaf culture and community around the world. The distinction between these is reviewed, and characteristics of each are identified. Students learn about the language, norms of behavior, values, traditions and possessions of Deaf people. Deaf culture and community are analyzed from a historical and sociological perspective. Cross-cultural issues relating to the role of hearing people with the Deaf community are also covered. (0882-200 or permission of instructor) **Class 3, Credit 3 (W)**

**0882-223 Deaf Women's Studies\***  
This course provides a historical review of deaf women in their professional and personal lives. The issues covered in this course include the exploration of the social, political and economic conditions affecting deaf women and how this compares to other women in society. Hard-of-hearing and late-deafened women and ethnic/minority women with hearing loss are included in this course. Students will be able to summarize trends from the social/political analysis and apply their learning to their own personal development and empowerment. (0882-200 or permission of instructor) **Class 3, Credit 3 (F, S)**

**0882-235 Individual and Social Identity**  
Provides an introduction to examining social constructs and perspectives in a broad spectrum of experiences related to race, ethnicity, gender, class, religion, age, sexuality, disability and other cultural identities. This course also focuses on analysis of diversity within groups as well as the multiple interactions between them. Students develop an understanding of how the power and complexities inherent in groups influence individual, as well as group, identity. (0882-200 or permission of instructor) **Class 3, Credit 3 (W, S)**

**0882-242 Law and Society**  
This course introduces students to general issues regarding the American legal system, jurisprudence and the responsibilities of free society and individual citizens of that society. The course provides an overview of the historical aspects of the American constitution, legislative intent of law making and how laws are made and interpreted at the local, state and federal levels. The course explores the roles of lawyers and other practitioners within the legal system and specifically addresses situations with criminal law, juvenile justice, tort law, consumer and mercantile laws, family law, and individual rights and liberties. (0882-220 or permission of instructor) **Class 3, Credit 3 (F, W, S)**

### Bridging (Level D)

**0882-285 Civil Rights and Deaf People\***  
Reviews the history of oppressed groups in the United States and their struggle for equality. Parallels will be drawn between various groups with a focus on deaf people. Patterns of oppression and empowerment will be compared and contrasted for Black Americans, Native Americans, women, lesbians and gays, and deaf people. Specific strategies and techniques employed to gain civil rights are covered. Court cases are reviewed and discussed. (ACT social studies/science reading score 9-11 or permission of instructor) **Class 3, Credit 3 (W, S)**

**0882-295 Social Sciences, Humanities and Technology: A Capstone Seminar (AOS)**  
Provides strategies that enable students to integrate concepts learned in previous technical, arts and science courses. Students develop a project related to a social issue or technological advancement using tradition and electronic research methods. Final projects are submitted as both research papers and class presentations. This course is offered in a seminar format. Students must be within two quarters of graduation with an AOS degree and have completed (or be within one quarter of completing) all degree-related NTID arts and sciences requirements for the AOS degree. **Class 3, Credit 3 (F, W, S)**

**0882-296 Social Sciences, Humanities and Technology: A Capstone Seminar (AAS)**  
Provides a culminating experience for AAS degree students with respect to concepts introduced in earlier arts and sciences, liberal arts and technical course work. Students apply skills of analysis, abstract reasoning, problem solving, statistical measurement and computer technology to explore a topic related to their technical major or career goal. Using traditional and electronic research methods, each student prepares a paper and presentation on the topic. This course is offered in a seminar format. Students must be within two quarters of graduation with an AAS degree and have completed (or be within one quarter of completing) their degree-related requirements in the College of Liberal Arts. Students must have completed Writing and Literature I and II. **Class 4, Credit 4 (F, W, S)**

**0882-398 Special Topics - Social Sciences**  
**Credit variable**

**0882-399 Independent Study - Social Sciences**  
**Credit variable (F, W, S)**

\*This course satisfies the deaf studies/American Sign Language requirement.

## Deaf Studies Certificate

The following courses are part of a certificate in Deaf Studies offered primarily for employees and volunteers in the private and public sectors and as a foundation for those wishing to pursue further education in the fields of interpreting or Deaf education.

**0876-211** **American Sign Language I**  
Students are introduced to approximately 300 basic conversational signs and grammatical principles needed to engage in survival-level conversations with deaf people. Fingerspelling and background information on Deaf culture and community are included. Each class period will have small group, large group and pair interactions. **Class 2, Credit 2, (F, W, S, Su)**

**0876-212** **American Sign Language II**  
Basic principles presented in ASL I are expanded. Students develop their ability to use linguistic features, culture protocols and core vocabulary to function in basic ASL conversations that include ASL grammar for giving directions; describing others; making requests; talking about family, occupations and routines; and attributing qualities to others. Videotaping of participants for evaluation and feedback is included as an instructional strategy. (0876-211 or equivalent sign skill). **Class 2, Credit 2 (F, W, S, Su)**

**0876-213** **American Sign Language III**  
This course continues the development of American Sign Language skills for students who have successfully completed American Sign Language II. The course focuses on ASL vocabulary, linguistic features and cultural protocols to enable students to function in survival-level ASL conversations with a focus on work-related and social communication. Students learn to talk about when activities occur; make requests; and discuss weather conditions, daily routines and health. (0876-212 or equivalent skill) **Class 2, Credit 2 (F, W, S, Su)**

**0876-241** **Aspects and Issues of Deafness I**  
Develops knowledge and understanding of the effects of hearing impairment, particularly with regard to the audiological, psychological, educational and vocational implications. Class activities include a simulated deafness experience, films, lectures and discussions. **Class 2, Credit 3 (F)**

**0876-242** **Aspects and Issues of Deafness II**  
This is the second of two courses providing a comprehensive orientation to deaf people of the United States for those interested in working and associating with deaf persons with sensitivity, confidence and skill. In this second course students will develop a deeper understanding of Deaf culture, the function of ASL and English within Deaf culture, the experience of growing up deaf, identity development in deaf people, and the diverse experiences of deaf people living in a primarily hearing society. (0876-241 recommended) **Class 2, Credit 3 (W, Su)**

**0876-311** **American Sign Language IV**  
This course continues the development of American Sign Language skills for students who have successfully completed American Sign Language III. The course focuses on ASL vocabulary, linguistic features and cultural protocols to enable students to function in survival-level ASL conversations with a focus on work-related and social communication. Students learn to talk about when activities occur; make requests; and discuss weather conditions, daily routines and health. (0876-213) **Class 2, Credit 2 (F, W, S)**

**0876-312** **American Sign Language V**  
This course continues the development of American Sign Language skills for students who have successfully completed American Sign Language IV. The course focuses on ASL vocabulary, linguistic features and cultural protocols to enable students to function in survival-level ASL conversations with a focus on work-related and social communication. Students learn to talk about hobbies and interests, money and commerce, and explain in detail how procedures and processes take place. (0876-311) **Class 2, Credit 2 (S)**

**0876-398** **Special Topics - Deaf Studies**  
**Credit variable (W)**

# First-Year Enrichment

## Index

1105 FYE..... 188

*Course numbering: RIT courses are generally referred to by their seven-digit registration number. The first two digits refer to the college offering the course. The third and fourth digits identify the discipline within the college. The final three digits are unique to each course and identify whether the course is noncredit (less than 099), lower division (100–399), upper division (400–699), or graduate level (700 and above).*

*Unless otherwise noted, the following courses are offered annually. Specific times and dates can be found in each quarter's schedule of courses, published by the Office of the Registrar. Prerequisites/corequisites are noted in parentheses near the end of the course description.*

*Courses listed below are offered at various times throughout the academic year. For more detailed scheduling and fee information, please check SIS. No Refunds on any courses after the formal add/drop period ends. The Center for Human Performance reserves the right to decline permission to "audit" any of the following listed courses.*

## First-Year Enrichment

**1105-051** **First-Year Enrichment I**  
The first part of the two-quarter First-Year Enrichment series is a survey course designed to assist first-year students in their academic, personal and professional success and to facilitate their academic and social integration into RIT. Students must complete both FYE I and FYE II in their first year. Criterion for exemption from the FYE requirement: first-year transfer students who have successfully completed the equivalent of two full-time quarters at another accredited institution of higher education and/or have taken a comparable transition course may request an exemption from the FYE requirement from the director of FYE. Students may drop, withdraw from or waive FYE courses only with the approval of the director of FYE. **Credit 1 (F)**

**1105-052** **First-Year Enrichment II**  
The second part of the two-quarter First-Year Enrichment series is designed to reinforce principles introduced in FYE I and advance the development of skills that lead to academic and personal success at RIT. Students must complete both FYE I and FYE II in their first year. **Credit 1 (W)**

**1105-048** **First-Year Enrichment Seminar**  
This seminar series is designed for first-time college students who enroll during spring quarter. The two-hour seminars are team taught by FYE instructors. Completion of the first three bi-weekly seminars meets the requirements for FYE I, and completion of the second series of three bi-weekly seminars meets the requirements for FYE II. **Credit 2 (S)**

**1105-051 or 052** **First-Year Enrichment Independent Study**  
This independent study course is only for students who complete FYE I and/or II with a D or F grade. The content will be designed to meet the needs of each individual student. Enrollment in this independent study course is available only with permission of the FYE instructor or director of the program. **Credit 1 (S)**

# Center for Intercollegiate Athletics and Recreation

## Index

1105	Wellness.....	189
1108	Dance.....	190
1109	Fitness.....	191
1110	Health and Safety.....	193
1111	Lifetime Recreation Activities.....	194
1112	Interactive Adventures.....	197
1113	Martial Arts.....	198
1114	Military Sciences.....	199

*Course numbering: RIT courses are generally referred to by their seven-digit registration number. The first two digits refer to the college offering the course. The third and fourth digits identify the discipline within the college. The final three digits are unique to each course and identify whether the course is noncredit (less than 099), lower division (100–399), upper division (400–699), or graduate level (700 and above).*

*Unless otherwise noted, the following courses are offered annually. Specific times and dates can be found in each quarter's schedule of courses, published by the Office of the Registrar. Prerequisites/corequisites are noted in parentheses near the end of the course description.*

## Health and Wellness Seminars

### 1107-026

#### Wellness for Life

This core wellness course is designed specifically to assist students in making healthy decisions regarding lifestyle behaviors. Students will be presented with wellness information (multidimensional) that will help them prepare for co-op, job interviews, the workplace and the building of healthy, lifelong relationships. Key areas that are covered: behavior change strategies, stress, high-risk behaviors, physical wellness, emotional wellness, psychological well-being, safety and spirituality. Unique in design, this class meets once a week and includes ice-breakers, instructional sessions and interactive group activities. A customized textbook is optional. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is no course fee. Check academic planning on SIS for updated quarterly offerings and course updates.

### 1107-027

#### Wellness Challenge Exam

This core wellness course is designed specifically as a “test out” option for students wishing to complete a wellness activity credit towards the requirement for graduation. Strong wellness background is required (multidimensional). Textbooks are available to prepare for the exam in the RIT bookstore (*Wellness: Concepts and Applications*, Anspaugh, Hamrick and Rosato). Dates of the exam will be individually scheduled between the student and the instructor. (Class restricted to fourth- and fifth-year students ONLY) To register, contact the instructor: Dugan Davies, dndhd@rit.edu, 475-6232; SLC 1260. Study guides are available in the SLC lobby magazine racks. Successful completion of this course/exam can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

### 1107-028

#### Massage: Wholistic Therapy

Therapy massage is an accepted part of many physical rehabilitation programs and has proven beneficial to many chronic conditions such as low back pain, arthritis and bursitis. It helps relieve the stress and tension of everyday living by providing relief to people from all walks of life—the weekend or competitive athlete, home gardener, overstressed executive struggling to keep pace in today's economy, secretaries, laborers, waitresses—anyone can feel a need for massage at some point in time. There are more than 200 variations of massage. This course is designed to provide students with the basics of massage therapy. Students will learn the “how to's” of providing and receiving a therapeutic massage, from upper body to lower. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

### 1107-030

#### Abilities and Possibilities (Ableism and Identity)

It's about possibilities, not the disability. This class will focus on increasing awareness of the issues that people with all kinds of disabilities face, both here on campus and in the outside community. We will examine how, despite misconceptions and stereotypes, people you may view as “different” or “challenged” are leading successful, inspirational lives. We will also learn about the impact of the disability policy in the U.S. and what the RIT community can do to increase awareness and promote change. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

### 1107-040

#### Eating, Body Image and Food

This course is designed to focus on the psychology of eating behaviors, body image and attitudes toward food. Issues that will be addressed include the meaning of food, factors that influence body image, dieting behaviors, cultural influences on eating and body image, obesity, eating disorders and, finally, healthy eating. This course is taught by the Women's Center staff. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

### 1107-050

#### Relationships and Safety (Sexuality and Safety)

This course is designed to provide students with educational concepts and strategies regarding relationships while keeping personal safety in mind. Instructors and students will explore the topic of relationships (friends, dating and partnerships) and being able to set appropriate boundaries so that relationships are able to thrive. Issues of relationship violence, stalking and sexual assault will also be addressed throughout the course. This course is taught by Women's Center staff. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

### 1107-070

#### Bonus Pass

This program is offered to students who have successfully completed two different wellness activity courses and are focused on continuing to improve their fitness levels. It is perfect for students interested in taking a variety of fitness classes each quarter. A quarterly schedule will be provided to students registered in this class that outlines the possible fitness-based classes they can freely attend. The cost of the course is \$50 via SFS bill, which includes 25 hours of fitness instruction. Students will receive an “audit” (X) grade (audits only). This course is restricted. To enroll, students must contact the instructor (Michelle Schrouder, mabcst@rit.edu; 475-6995) to register. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

### 1107-080

#### Health/Fitness Challenge

The course is based on the RIT health challenge initiative. The class is designed to assist and motivate individuals who are interested in making changes to live healthier. Participants will be setting and reaching goals in the following three areas: fitness, nutrition and wellness. Students will monitor their progress using a customized website at [www.rithealthchallenge.com](http://www.rithealthchallenge.com). Examples of past accomplishments include cutting down on caffeine, getting more sleep, eating healthier, training for a marathon or 10k, running 3 miles a day/4x per week, adding weight training to exercise routines and much more. Topics that will be covered include fad diets, exercise options, healthy eating and caloric levels, weight management, disease prevention and healthy permanent habits. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

### 1107-100

#### Stress Management

This course focuses on the dynamic ways that students can effectively manage stress. Today's faced-paced daily grind can easily become overwhelming. It is difficult to balance the various duties and responsibilities that we face every day. This course will examine what stress is, how stress affects the body and how to effectively manage stress in a healthy fashion. Students will have the opportunity to experience a variety of different stress management techniques in order to determine which ones are best suited for them: deep breathing, massage, tai chi practices, yoga and muscle relaxation are just a few of the techniques that will be introduced. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1107-110****Smoking Cessation**

If you have tried to quit smoking and failed before, take comfort in the fact that most smokers fail several times before successfully quitting. Your past failures are not a lesson that you are unable to quit but rather a step in the normal journey toward becoming a non-smoker. The information presented in this course will help ease your way and ensure that this is the last time you will need to go through the quitting process. Discussion pieces during this course will include: tobacco companies/promoting smoking; studies; physical effects of smoking; Nicotine Anonymous' 12-step program and effective strategies to assist you during the quitting process. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**Dance****1108-070****Ballet**

Ballet is a form of dancing performed for theater audiences. Like any other dance forms, ballet may tell a story, express a mood or simply reflect the music. But a ballet dancer's technique (way of performing) and special skills differ greatly from those of other dancers. Ballet dancers perform many movements that are unnatural for the body, but when these movements are well-executed, they look natural and beautiful. This course will focus on the various ballet movements, from the very fundamental to more complex movements and poses and classical styles. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1108-080****Ballroom Dance**

This foundational course is designed for complete beginners to intermediates, covering dances that are socially trendy and popular. The focus is on a mixture of melodies and Latin rhythms to give students an overall feel for social dancing. The intent is to create a sense of student competency as an above-average ballroom dancer. Major course objectives include: body- and self-awareness, how to mix well with the same and opposite sexes, boosting self-confidence, developing natural body rhythms and improving posture and poise. Dances covered are: foxtrot, merengue, swing, salsa, jazz, tango, waltz, cha-cha, ballet and jitterbug. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1108-100****Contemporary Jazz Dance**

This course provides students with a wider range of dance vocabulary, which is created from ballet, modern dance and ethnic traditions. The styles of Bob Fosse and the fall/rebound and style of José Limon are a basis for this course. It focuses on the fundamental movements required for successful and enjoyable jazz dancing. The class is held in the SLC dance studio. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1108-120****Country Line Dance**

Covering the latest line dances, club and studio couples dances, Country Line Dancing is designed for beginning to intermediate dancers. Traditional dances give depth and background to the basic terminology and techniques. Becoming familiar with today's social sector, dance adds excitement to body coordination, improved memorization, partner skills, self-confidence and enhanced creativity. The electric slide, chattahoochee, Dr. CC, earthquake and Bubba are line dances of distinction. Couples pursue the cha-cha, two-step, waltz and the sugar waltz (full of turns and spins). Beginning with music beats and basic dance choreography counting, students pursue understanding that creates the foundation for all. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1108-160****Dance/Ballet - Special Topics**

This course introduces the art of ballet, its vocabulary (French, Sign and English), discipline base, protocols and specific movements. Students are introduced to key concepts through lecture-demonstration video and floor, center and barre work. Class offered through NTID Dept. of Cultural and Creative Studies in the LBJ Building (Building 60). Instructor uses sign language, but classes are open to hearing and deaf/hard-of-hearing students. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. Check academic planning on SIS for updated quarterly offerings and course updates.

**1108-180****Dance/Jazz - Special Topics**

This course provides students with a wider range of dance vocabulary, which is created from ballet, modern dance and ethnic traditions. The styles of Bob Fosse and the fall and rebound style of José Limon are a basis for this course. It focuses on the fundamental movements required for successful and enjoyable jazz dancing. The class is offered through NTID Dept. of Cultural and Creative Studies in the LBJ Building (Building 60). Instructor uses sign language, but classes are open to both hearing and deaf/hard-of-hearing students. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. Check academic planning on SIS for updated quarterly offerings and course updates.

**1108-200****Dance Performance**

This course is designed to provide an introduction to dance that give students access to the language as well as the fundamental movements of modern dance. The styles and techniques of Martha Graham (contraction) and José Limon (fall and rebound) are explored. The basic structure of the body will be studied as it applies to creative movement. Ensemble work, performance standards and creation of character and theme are stressed with respect to performance in the studio and on stage. Class sessions are held through NTID Dept. of Cultural and Creative Studies in LBJ Building (Building 60). Instructor uses sign language, but classes are open to both hearing and deaf/hard-of-hearing students. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. Check academic planning on SIS for updated quarterly offerings and course updates.

**1108-240****Fundamentals of Choreography**

This course explores the freedom and discipline that balance the art of choreography. Visualization and notation systems are studied. Students are required both to choreograph for student ensembles and to perform in original works of other students in the class. The class is offered through NTID Dept. of Cultural and Creative Studies in the LBJ Building (Building 60). Instructor uses sign language, but classes are open to hearing and deaf/hard of hearing students. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. Check academic planning on SIS for updated quarterly offerings and course updates.

**1108-260****Hip Hop Dance**

Hip hop dance refers to styles primarily danced to hip hop music or that have evolved as a part of the hip hop culture. Hip hop dances are often considered street dances because of how they were formed and are being practiced. This hip hop class offers basic to more advanced skills that will encourage students to use their bodies in ways that help to develop/execute many different stylistic techniques. This class is fast-paced and challenging and allows students to emphasize their creative rhythmic talents. As hip hop is a broad genre in dance studios the instructors have the freedom/room for personal interpretation, thus allowing the class to be highly creative. This class is held in the SLC dance studio. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1108-280****Irish Step Dance**

Often marked by a blur of flashing feet, Irish step dancing has emerged from the pubs of Ireland to the international stage. This course offers styles of dance made famous by the shows Riverdance and Lord of the Dance. In addition to being introduced to the rich history of Irish dance, students will learn soft-shoe, hard-shoe and ceili (group) dances. Be prepared for a great cardiovascular workout. Irish dance requires endurance, coordination and strength. The first dances (reels, jigs and slip jigs) are taught in soft shoe. These dances start to teach the basics of Irish dance. As you progress, you will start to learn more complex soft-shoe dances and then move on to hard-shoe dances (treble jigs and hornpipes). Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1108-340** **Swing Dance**  
Swing Dance encompasses most of the forms of dance such as West Coast swing, lady hop, Balboa, shag, jitterbug, bop, whip, jive and dances under many other names. There is a recent resurgence in Swing Dance all around the world. All the elements exist today that are necessary to bring on a world-wide dance craze (movies, music, funky clothes, places to learn and places to dance and television commercials featuring swing dance). This course is designed for ALL levels of students who wish to learn and participate in the fun and exciting activity of swing dance. The instructor will introduce a variety of dance steps and movements to music. Students will work in pairs and small groups. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates. Advanced/intermediate is offered in the winter/spring and requires previous class experience.

**1108-360** **Tango**  
Tango dancing covers several subjects, including tango step patterns. Class sessions will focus on breaking down these patterns into a few very simple patterns of no more than three individual steps. Students will learn a few easy ways to vary and combine these basic patterns and create an understanding to learn new complex patterns very quickly and easily, also allowing for individual creativity. The “steps” of a dance are the most visible part of tango, so every student should be eager to learn them—both to lead and to follow—and to navigate the dance floor. This is Argentine tango. Students will also learn about one of the most important parts of any dance—its music. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1108-380** **Tap Dance**  
Smooth dance movement, quick style changes, transitional moves and the familiar sound of the tap shoe can be yours. Beneficial cardiovascular improvement along with muscular coordination, self-presentation, musical accompaniment and sheer expression grace this course. Experience will grow with participation. Tap dance history, development, art-form presentation, skill expression and step improvement will be enhanced. Tap shoes may be purchased locally. Building new dance steps will conclude with individual and group presentations. Skill sharing and learning include musical selection and choreographic recommendation. Tap is offered periodically throughout the school year (depending on instructor and facility availability). Class meets in SLC Dance Studio. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

## Fitness

**1109-002** **Aerobics (Cardio Conditioning)**  
This fitness course is designed to facilitate cardiovascular fitness as well as increase muscular strength, endurance and flexibility. All aerobics classes combine a balance of high- and low-impact moves that include a sequence of muscular strengthening and stretching exercises. In addition to the benefits of improved heart and lung function, students will have an opportunity to burn calories and increase muscular strength, endurance and flexibility. Throughout the course students will be encouraged to work at individual paces, utilizing high- or low-impact moves where appropriate. Through instructor-lead group movements, with the use of music, brief explanations of basic aerobic principles, definitions and guidelines for proper technique will be covered. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-003** **Aquathenics**  
This course is designed to provide an alternative to traditional conditioning programs such as weight training, swimming and/or aerobics. Aquathenics (choreographed exercises in a water environment/pool with or without music accompaniment) assists in promoting physical fitness through the enjoyment of aquatic exercise by utilizing the natural resistance that water provides. Students should feel comfortable in shoulder-level water (do not need to participate in swimming strokes). Major objectives: Develop overall toning, strength and circulation; improve cardiovascular strength and relieve muscular tension. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-005** **Conditioning and Fitness**  
This course is designed for students who wish to enhance their overall level of physical fitness by designing a customized personal program of activity. Students will essentially be assessed in terms of their baseline physical fitness norms (cardiovascular fitness, muscular strength and endurance, flexibility, body composition, blood pressure). Students will then establish individualized fitness goals. Through small group demonstrations and instructor lectures, students will then design a fitness program that will assist them in achieving their goals. The majority of class time will be devoted to physical activity and program design. Students will learn how to safely use free weights and Selectorized equipment. Students will learn how to design a “home-based” fitness program. Individual fitness folders will be established for regular and easy self-monitoring. This is an excellent high-energy, motivating class. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-006** **Kickboxing (Cardio Boxing; Cardio Boxing and Abs)**  
Kickboxing, also known as aeroboxing, is a combination of high-intensity aerobics combined with boxing movements such as three different types of punches and a variety of kicks. This type of course allows students to fully challenge their cardiovascular endurance. Class consists of warm-ups, choreographed routines, cool downs and abdominal work. A course fee applies. Options for this course are kickboxing or cardio boxing and abs). Class consists of warm-ups, choreographed routines and cool kickboxing and abs. Both course variations allow students the option of using gloves during class, without contact. Gloves are recommended, but not required, and can be purchased (see instructor for purchasing information). Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-008** **Aquasize**  
This course provides an exercise program that will guarantee fun and fitness development in an aquatic environment. Aquasize is a non-stop high-energy aerobic workout in the pool in both deep and shallow water. Aquasize provides constant water resistance, which will strengthen and tone every muscle in the body. For all levels of fitness, this water workout is designed to accommodate those seeking a vigorous aerobic workout as well as those needing/desiring a less strenuous workout. Activities include water jogging, resistance strengthening with noodle nautilus and stretches with the support of water. Students should feel comfortable in shoulder-level water; swimsuits required. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-009** **Turbo Kick**  
Turbo kick is one of the hottest exercise classes around. It involves kickboxing but is so much more. Students will kick, punch and groove the calories away in this action-packed, super fun, super safe and ultra-effective cardiovascular workout. Created in 1997 by Charlene Johnson, turbo kick is arguably the most popular group exercise program in the country. This program is featured at over 2,000 different health clubs and fitness chains in the United States and countless countries around the globe. The course consists of high and low kicks and punches, no gloves required, to pop music with intense cardio workout demands. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-011** **Total Body Conditioning (Step Conditioning)**  
This low-impact activity class is designed to benefit beginner, intermediate and advanced fitness enthusiasts. The class is organized to provide work sessions on muscle groups using hand weights and/or resistance bands to tone and shape muscles resulting in improved overall fitness. Alternative exercises will be demonstrated to accommodate all levels of fitness. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check SIS for updated quarterly offerings and course updates.

**1109-013** **Core Stability (Core Glutes and Abs)**  
Core strength conditioning will focus on developing/strengthening the body's core muscles: lower back, abdominals, hips and gluteus. These are the foundation for all other movements of the body. Through use of Resist-a-Balls, weights, bands and conditioning exercises, the focus will be to develop and strengthen the body's trunk and pelvis area where the center of gravity is located. Benefits include improved posture, increased flexibility and range of motion, increased strength and protection of the spine, more stable center of gravity and controlled movement. This class is designed for all fitness levels. Instructor-lead exercises and explanation of core principles and proper technique will be covered. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-015** **Jogging**  
Cardiovascular fitness, exercise awareness, endurance increase, resting heart rate improvement and the pure joy of jogging will add an element of educational self-confidence building activity to your college career. Lecture, participation and gradual endurance awareness enlighten your jogging. A course evaluation based on attendance, practical work improvement and attitude, allow jogging class students experience in building many miles on a gradual time-increased program from one to four miles per run throughout the quarter. Jogging is a delightful mind-freeing exercise. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-016** **Jogging: 10k Training**  
This activity course will prepare students to participate in and complete a 10k run. Running provides many long- and short-term health benefits as well as skills that are beneficial in professional and personal life. Students will improve their fitness as well as develop knowledge about the basics of nutrition and appropriate training (training plan and cross training). Class includes lecture, participation, supplemental readings and class workouts. Students will be expected to do some readings and assignments outside of class and will be required to complete 2-3 workouts independently during the week. Students will be graded on participation, weekly performance on assignments and a final exam. The final exam will be entry and participation in and completion of a local 10k race. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-017** **Run/Fitness/Competition**  
This fitness and conditioning course is for students who enjoy running as a means to cardiovascular health. It is designed for all types of runners who want to improve their running form and efficiency, improve their overall cardiovascular health or even train for a race. This course benefits all fitness levels. Every other class is active running; the other will be a classroom session to teach the different training methods of aerobic running, lactate threshold, VO2 max training, etc. The how to's of structuring one's own running program will be covered. There will also be components on proper nutrition and shoes and the community resources available to race and train with others. The overall goal is to provide proper training while improving running performance. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-019** **Walking for Fitness**  
This course is designed to be beneficial for individuals of all fitness levels. It will take place outdoors as weather permits. The major course objectives are to improve cardiovascular endurance, increase energy expenditure, develop overall toning, improve circulation and relieve tension. There are additional benefits of a prolonged low-impact physical activity such as purposeful walking done regularly. One can substantially reduce the risk of heart disease, lower total cholesterol, raise healthy HDL cholesterol and lower blood pressure. Course content will include stretching, warm-up, proper form, pace management, interval training, determining intensity and target heart rate and individual goal setting. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-021** **Spinning**  
This course is an indoor group cycling class that incorporates motivating music and disco lights. Johnny-G Spinner Bikes are used for a moderate to high-intensity, low-impact aerobic and endurance program. The general fitness goals for the course are to facilitate a healthy level of cardiovascular fitness; enhance overall fitness and end endurance; develop coordination and balance; and improve or maintain muscle tone, strength and flexibility. At the end of the course, students should be able to properly set up the adjustments on the spinner bikes to ensure safe cycling and know the three basic hand positions and when they are appropriate, the five basic movements used for safe and effective indoor cycling, and ways to monitor heart rate. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-030** **Swimming for Fitness**  
This fitness and conditioning activity course is designed for students who enjoy the venue of swimming to develop cardiovascular health. Designed for intermediate to advanced swimmers. This is NOT an instructional swimming class. The course will focus on: general aquatic fitness, stretching, refinement and development of all swimming strokes, lap swims, sprints, and a combination of timed laps and outlined swim practices. Cool-down sessions will take place followed by ideas for muscular strength and endurance development (outside of aquatic environment). This course is a perfect fit for individuals who wish to pursue physical fitness development in a "non-impact" situation. Students must provide their own swimming attire. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-045** **Water Polo**  
This exciting aquatic-oriented activity course is designed for students who wish to learn the sport of water polo. Students must be able to swim comfortably in sometimes challenging situations before taking this course, which calls for basic-advanced skills of water polo. The general course outline covers: basic swimming/sculling skills; individual physical building blocks (strength, flexibility, speed, fitness) and core individual skills; game rules/history/basic strategies; offensive skills and strategies; defensive skills and strategies; goal-keeping; plays; refereeing; and tournament play. Students must provide their own swimming attire (suit, goggles if desired, deck shoes, towels). RIT provides all other equipment. Class meets in the competitive pool and provides an excellent fitness workout. Students will practice basic fundamentals, then progress into the competitive polo environment. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-046** **Bootcamp**  
Ultimate Bootcamp is an exciting indoor/outdoor, full-body conditioning fitness program designed to challenge, tone and trim your body in 10 intense weeks. Whether you're a workout novice looking to jump-start a healthier lifestyle, training for a special event such as a wedding or high school reunion or an athlete looking for a new challenge, this program can help you reach your fitness goals while enjoying it. Boredom is not an option in this two-day-a-week program based on philosophies from both personal training and group fitness. By combining calisthenics, plyometrics, resistance training, cardiovascular challenges, relay races and partner drills, you get an action-packed workout in one exciting hour. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1109-048** **Introduction to Weight Training**  
Basic weight training fundamentals offer beginners to intermediates the chance to build strength through method discovery. Content includes: stretching, flexibility, spotting, safety, free weights, Selectorized (Cybex and Paramount) equipment, the different kinds of program designs, and cardiovascular development. Course design will focus on individual need and desire, leading to unique and successful program designs. Instructors will present information on muscle development, basic CV training; use of free weights and Selectorized equipment. Class work involves initial orientation, handouts, discussion, definitions, station techniques, free weight specifics, and routine development for total body work. Beginner, intermediate, advanced and women's sections are offered. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.



1109-049

### Introduction to the Wiedman Fitness Center

The Wiedman Fitness Center offers students a wide variety of options in terms of overall physical fitness development. This class is designed for the very beginner who is not sure where or how to begin a fitness regime. A comprehensive tour of the facility will be provided along with thorough demonstrations of all the equipment that is available. Additionally, tours of the facilities in the Center for Athletics and Recreation (gyms, pool, rink) will be provided along with a variety of demos of several different activity classes and planned lectures/presentations (depending on the class interest). Students will gain a jump start in developing a more regular exercise program that is perfectly suited for them. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

1109-300

### Pilates

This course will help to dramatically transform the body to look, feel and perform better. Pilates builds core inner strength without the excess bulk, creating a toned body with stronger legs and abdominals. This activity teaches body awareness, good posture and easy, graceful movements (beginner). Intermediate delves more into understanding the body and how it works. Advanced Power Pilates students work the entire mat and then add a "punch" with the use of balls and weights. This course moves more quickly at a pace to get the heart rate up. The core muscles will be more developed and arms and legs. It is recommended that students be enrolled in the intermediate section while also in Power Pilates. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

1109-310

### Group Fitness Bonus Pass

This program is offered to students who have successfully completed two different wellness activity courses and are focused on continuing to improve their fitness levels. It is perfect for students interested in taking a variety of fitness classes each quarter. A quarterly schedule will be provided to students registered in this class that outlines the possible fitness-based classes they can freely attend. The cost of the course is \$50 via SFS bill, which includes 25 hours of fitness instruction. Students will receive an "audit" (X) grade (audits only). This course is restricted. To enroll, students must contact the instructor (Michelle Schrouder, mabcst@rit.edu; 475-6995) to register. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

1109-320

### Health/Fitness Challenge

The course is based on the RIT health challenge. The class is designed to assist and motivate individuals who are interested in making changes to live healthier. Participants will be setting and reaching goals in the three following areas: fitness, nutrition and wellness. Students will monitor their progress using a customized website at [www.rithealthchallenge.com](http://www.rithealthchallenge.com). Examples of past accomplishments include: cutting down on caffeine, getting more sleep, eating healthier, training for a marathon or 10k, running 3 miles a day/4x per week, added weight training to exercise routines and much more. Topics that will be covered include: fad diets, exercise options, healthy eating and caloric levels, weight management, disease prevention and healthy permanent habits. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

1109-330

### Yoga

A body/mind discipline, yoga enables posture improvement, flexibility development and learned relaxation. Mastered through learning an ancient posture series incorporating breath control, the body and mind relationship is explored. The practice of meditation gives one an opportunity to experience stress management. Relaxation is yoga practice's key. Attendance is required. Classes contain sequential stretches, postures and relaxation exercise incorporated with breathing and visualization. Recommended clothing is comfortable and loose fitting. Mats are provided. Music featuring new age and mainstream artists provides an inspiring atmosphere. Hatha Yoga exploration includes a diverse discipline collection for improving mental and physical health. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

1109-340

### Kundalini Yoga

Kundalini yoga as taught by Yogi Bhanan is a 5,000-year-old authentic system of yoga exercise and meditation that promotes health, happiness and spiritual awareness. Kundalini yoga is taught in over 300 centers in 35 countries by teachers trained through the international Kundalini Yoga Teacher's Association. Combining breathing, movement, stretching and sound, Kundalini yoga is a safe, comprehensive technology that can be practiced by everyone. Through yogic breathing and meditation, peace of mind can be obtained, giving an experience of deep inner calm and self-confidence. Kundalini yoga is more than a system of physical exercise. The technology is aimed at the spirit that has no boundaries. Therefore, it is universal and nondenominational. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

## Health and Safety

1110-001

### Care and Prevention of Athletic Injuries

This course is designed to provide a thorough overview of the most common athletic-related injuries as well as the techniques for appropriate care and prevention of these injuries. The main objective of the course is to provide students with the opportunity to learn how to become student athletic trainers. Upon successful completion of the course, students MAY qualify for professional employment opportunities in the RIT sports medicine area. The major topics to be covered are: basic anatomy and physiology review; airway obstruction; CPR; muscle strains and sprains; joint dislocations; controlling bleeding; treatment of shock; soft tissue injuries; care of bone fractures; splinting; emergency response skills; injuries to the head, face, eyes, neck and back. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

1110-012

### CPR and First Aid

This course is designed to provide certification by the American Red Cross for CPR and first aid. Upon successful completion of the course, students will receive certification cards for CPR (good for one year) and first aid (good for three years). Class sessions are generally 2-4 hour formats, meeting once a week. Students will be presented with information on the following for infants, children and adults: rescue breathing, blocked airway for a conscious or unconscious person, CPR, responding to an emergency situation, controlling bleeding and splinting techniques. Class sessions may include the use of videotapes, lectures, demonstrations, partner practice and skill evaluation (by the instructor). All equipment (mannequins, mats, wraps) is provided by RIT. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee and the cost of required ARC textbooks applies. Check academic planning on SIS for updated quarterly offerings and course updates.

1110-049

### Lifeguarding

This course is designed to provide students with a certification by the American Red Cross (ARC). Training consists of methods for individual rescue around and in the water. Basic skills and concepts will be presented. Objectives are: successful completion and certification for each individual at the end of a 10-week course. Prerequisites for this course include a continuous 500-yard swim and demonstrated accomplishment in the front crawl, side stroke and breast stroke. Students are required to have or purchase a lifeguarding textbook. This course covers all skills required by ARC. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee and the cost of required ARC textbooks applies. Check academic planning on SIS for updated quarterly offerings and course updates.

1110-060

### Water Safety Instruction

Water Safety Instruction (WSI), a certification course through the American Red Cross, enables students to teach swimming and lifesaving classes following successful completion. Current lifeguarding certification is a prerequisite. Preparation for teaching proper Red Cross classes follows instruction in lifeguarding skill review, strokes, teaching methods, class structuring and organization. Assignments, quiz evaluation and a written course final are given. Purchase of a book series is necessary for course completion. An intriguing course exploring teaching methods and problems, WSI allows actual teaching experience within the class curriculum. A course fee and the cost of required ARC textbooks applies. Check academic planning on SIS for updated quarterly offerings and course updates.

## Lifetime Recreation Activities

### 1111-001

#### Archery

This course is designed to present the lifetime recreational activity of archery in a broad perspective for future use as a recreational and /or competitive pursuit. A major objective of the course is to develop strength in the upper back, neck and shoulder girdle. Students will be presented with the proper shooting techniques and forms. Instruction in the proper selection, use and care of archery tackle (equipment) will be provided. Students will be introduced to the rules, safety, etiquette of archery and archery competition. Once the fundamental skills have been well mastered, students will participate in a variety of class competitions (field, American, hunter, golf, clout, and flight.) Equipment provided by RIT. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check Academic planning on SIS for updated quarterly offerings and course updates.

### 1111-003

#### Badminton

Most people regard badminton as a gentle, noncompetitive, backyard diversion for relaxing summer afternoon play. However, the best setting has been found to be indoors on a breezy court. Here the shuttlecock ("birdie") can zip back and forth under great control with amazing speed: It becomes a very exciting game. Because it is physically and mentally demanding, it is one of the most invigorating and challenging sports in the world. It is also a great reducer of stress and tension and a wonderful muscle-toning activity. For the competitive person, badminton offers limitless opportunity to develop skills and for others it is a wonderful recreational activity. Designed for beginners to intermediate players. Equipment provided by RIT. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

### 1111-004

#### Basketball

This course is designed for beginner to advanced male and female students. It is designed to emphasize basic skill development and refinement, team competition and tournament play. Students will be encouraged to develop individualized skills of the game of basketball: Passing, shooting, dribbling, rebounding, offensive and defensive movement techniques. Objectives of the course are to enjoy playing the game of basketball/team competition, physical conditioning enhancement, to become more informed as to the strategies of the game and to benefit from the sociological aspects of becoming involved with a team sport. The general format of each class will include a warm-up, basic and advanced drills and in class competitions. Students must be dressed in appropriate athletic attire and sneakers. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check Academic planning on SIS for updated quarterly offerings and course updates.

### 1111-009

#### Pocket Billiards

Pocket Billiards (new course title) is enjoyed by many of all ages and at all levels of proficiency. The purpose of this course is to develop the fundamentals of a sound game. Emphasis is on stance, grip, bridges, stroking and aiming. Other topics introduced are: stop shots, follow, draw, "english," position play, banks, caroms, combinations, eliminations, break shots and safety play. Games taught and played are 8-ball, 9-ball, straight (14.1) and cutthroat. All equipment is provided by RIT, and no previous experience is necessary for beginners' sections. 24-student limit; 14-student limit for the advanced section (strong background required). Class meets in SAU game room. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

### 1111-012

#### Bowling (off campus)

This course is designed for beginner, intermediate/advanced students. The course is designed to practice the basic techniques of bowling and covers the following: stance, push-away, back swing, approach and release (fundamental skills of the game). Students will learn the importance of proper ball selection and care of equipment (balls, shoes, gloves). The class will be presented with the rules and etiquette of the game. Once averages have been established, students will be placed on teams and will bowl as a competitive league for the remainder of the quarter. Course held off campus at AMF Olympic Bowl; RIT does not provide transportation. Contact AMF Lanes (235-5341; amf00619@amf.com) for more information. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

### 1111-028

#### Fencing

This course offers an introduction to the sport of fencing: basic moves, rules knowledge and understanding in combination with conditioning principles, stretching and flexibility. Objectives include basic footwork proficiency, fencing blade work skills, rules understanding, experiential learning and the opportunity to direct (officiate) for one another. Classes begin with a light warm-up followed by stretching and conditioning exercises. Focus on the basics and fencing moves also includes competition discussion and bout situations. Grading is on attendance. Class options include Foil, Sabre and Advanced Fencing Sabre (Spring quarter only). For more information on Advanced Fencing Sabre, contact cvlisma@rit.edu or htgsma@rit.edu.course. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

### 1111-032

#### Fresh Water Fly Fishing

This freshwater fly fishing course introduces students to fly fishing skills, including: identifying trout species, understanding trout behavior and trout habitat, basic entomology and hatch calendar, recognizing common artificial wet and dry patterns, tying wet and dry fly patterns, viewing some popular trout streams in the Northeast and the western United States and reading stream conditions. This course includes hands-on sessions for fly-casting techniques. A course fee applies (via student financial services bill). Equipment rental for students who need it (rod, reel, leader material and flies) is \$25. Class meets weeks 3-7 of the quarter, with the last class meeting off site at the same regular class time. RIT does not provide transportation. Car pooling with others in class is a possibility. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check Academic planning on SIS for updated quarterly offerings and course updates.

### 1111-033

#### Flag Football

Flag football offers a chance to experience football at its best. Sports equipment will be provided. Individual skills combine in an atmosphere of teamwork, goal attainment, leadership awareness and excitement. Skill presentation, demonstration, drill work and play allow students of all levels to benefit from flag football involvement. Passing, catching, flag techniques, offensive/defensive play, creativity, kickoffs, point after attempts, hand offs and rule review will highlight the course. Active participation progresses fitness levels in many areas. Flag football will be offered at various times throughout the school year (depending on instructor/facility availability). Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

### 1111-035

#### Dodgeball

Relive the glory days of summer camp and middle school by taking part in one of the fastest growing activities on college campuses across the country. Dodgeball is a great way to exercise, relieve stress and, most important, have fun. This course will focus on the recreational game of dodgeball as it is sanctioned by many leading organizations. Students will play the game using different rules, formats and balls, court and team sizes. This will be an intense, competitive class but with a relaxed, open environment that will accommodate all ability levels. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

### 1111-036

#### Frisbee (Ultimate Frisbee)

Ultimate Frisbee is a non-contact disc sport played by two teams of seven players. The object of the game is to score goals. A goal is scored when a player catches any legal pass in the end zone of the opposing team. The disc (Frisbee) is advanced by throwing or passing it to teammates. The disc may be passed in any direction. Any time a pass is incomplete, intercepted, knocked down or contacts an out-of-bounds area, a turnover occurs. A turnover results in an immediate change of team possession of the Frisbee. Students will learn the rules, basic throws and strategies of this exciting game while developing levels of physical fitness. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-037****Disc Golf**

Disc golf is played much like traditional golf but uses a flying disc in place of the ball and clubs. The sport was formalized in the 1970s and shares with “ball golf” the object of completing each hole in the fewest number of throws. A golf disc is thrown from a tee area to a target, which is the “hole,” an elevated metal basket (pole hole). Disc golf shares the same joys and challenges of traditional golf, whether it’s sinking a long putt or hitting a tree halfway down the fairway. This class is designed for all ages and male and female participants. Depending on transportation, this course may be offered on campus or at an off-site location. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-038****Golf**

Beginning golf familiarizes the student with basic techniques, rules, etiquette, equipment and various course layouts. Players will benefit from play alongside novice and experienced-level players. Unique individual critiques, etiquette discussion, grip coverage, stance, posture and swing planes are learned as well as use of irons, woods and putters. When appropriate, videotaped presentations are shown. Stretching, technique demonstration and review combine with hitting practice using various clubs to fill 50 minutes of experiential golf education. Professional presentation delivery and breadth of information in combination with practice lead to the required 27-hole class. Written examination and self-performance videotape test learning levels. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-041****Horseback/English**

Student equestrian skills, horse control, walking work, the trot and canter develop within this beginning English-style horseback riding course. Moving on to a higher level, such as intermediate and advanced courses, students learn fence jumping and fence course introduction, while further refining equestrian skill. Course objectives include riding and stable safe work techniques, developing correct positioning, riding control and specifics dealing with a variety of horses and presented situations. Ground work education such as horse stall exiting, ground leading and correct mounting procedures along with walking, sitting, posting and two-point positioning, walking without stirrups, trotting and cantering lead into intermediate skills. Important note: Students **must** call Huntington Meadows Stables to set up lesson times (872-9924 or 872-6286). Leave phone number. Instructor fee of \$180 (plus \$5 SFS bill) applies. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-042****Horseback/Western**

Enjoy scenic trail riding while learning how to safely work and communicate with western trained horses at Liberty Stables in Bloomfield. Designed with the novice in mind, this class includes weekly discussions and rides. Students will learn to ride at a walk, trot and canter. The variety of 15 lesson horses allows for a range of experience levels. Class discussions/demonstrations include ground and riding safety, basic care and maintenance of horses as well as a bit of history of the human/horse relationship over the past 3,000 years. With 80 beautiful acres of rolling countryside, open fields and forested areas as well as outdoor/indoor lesson rings, you are sure to develop your riding foundation. Attendance is key to success in this class. A \$180 instructor fee applies (plus \$5 SFS bill). Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-049****Ice Hockey**

This course is designed for beginning to advanced ice hockey players. Students must provide their own helmet, hockey stick and gloves. Course objectives: to learn the basics of equipment, safety, skating acceleration, stick handling, skating agility (forward and backward) and basic drills. The advanced classes (power skating) are **not** for beginners. These classes will cover advanced hockey skills, including: shooting, passing for accuracy, advanced drills, defensive zone coverage and competitive play. If the class is above average in ability, a session on power plays and penalty kills may be added. No body checking is allowed in class. All penalties during class will be penalty shots. Students may rent skates (rental fee applies). Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-050****Ice Skating**

This course is designed for beginner to advanced ice skaters. Instructional emphasis will be on safely learning the lifelong activity of ice skating. Early in the quarter, students will be introduced to aspects of basic use and care of equipment and safety implications. Once basic skills have been obtained, students will progress as follows: gliding and snow plough stop; forward glide and sculling; backward glide and sculling; forward crossovers; short jumps and turns; two-foot spins; forward chasses; Killian hold; backward chasses, waltz hold; foxtrot hold; forward drag, bunny hop and lunge; forward arabesque; combination jumps and spins; Sal chow and basic program development. Students may use their own skates or can rent skates at the rink. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-053****Juggling**

This course is designed to acquaint students with the art of juggling in theory and practice while at the same time conditioning their minds and bodies. Course concentrates on three- and four-ball juggling patterns and is geared to accommodate all levels of learners. Instructor will teach one-on-one as well as group demonstration. Clubs, rings, combination cigar boxes, scarves, club swinging and five-ball juggling will be taught where appropriate to advanced students. Personal instruction will be supplemented with juggling movies, literature and video taping. The goal of the course is not only for each student to achieve maximum juggling ability but also to increase mental concentration and physical coordination. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-060****Officiating: All Sports (Basketball)**

Class provides competencies necessary for officiating basketball. Basic rule review covers detailed aspects of the game. Officiating techniques are presented as well as practiced in an understandable, growth-providing approach. Fitness level is improved through drills, on-court experience and playing options. Explanation through tape review, discussion and experiential learning provides useful skill enhancement. Basketball officiating is offered at varied times throughout the academic year (depending on instructor and facility availability). Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-065****Racquetball**

Racquetball is designed to teach skill development for beginners to advanced-level players. Focus for the beginner is on skill development and refinement, while intermediate to advanced players focus on perfecting the strokes and competitive strategies. Activity level is high. Students will have the opportunity to develop overall fitness elements. The basic course objectives are: skill understanding, enhancement of the social/emotional components, CV fitness, basic shots, equipment, warm up/cool down, training and game strategies. This course meets twice weekly for 50 minutes in the SLC racquetball courts. Racquets and balls are provided. Eye guards are required and may be purchased locally. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-075****Snowboarding**

Participation in this program may be for wellness activity credit or just for fun. Bristol Mountain will determine the cost of the class each fall. Fees are subject to change but are currently \$165 (includes six lift passes and lessons). Board rental is \$70 (if needed). The \$165 is a package fee that includes both lift passes and lessons, although the lessons are optional. Students receive 1 wellness “activity” credit by participating for 20 hours of boarding. Class starts the 1<sup>st</sup> week of January. Students must register at the SLC front office (late October). Boarding can begin as early as 4 p.m. The class runs for six consecutive weeks. RIT does not provide transportation, but car pooling can usually be arranged. Directions are at the SLC. For more details call 475-7372 (instructor) or e-mail atsped@rit.edu. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-077****Skiing/Downhill**

Participation in this program may be for wellness activity credit or just for fun. Bristol Mountain will determine the cost of the class each fall. Fees are subject to change but are currently \$165 (includes six lift passes and lessons). Ski rental is \$70 (if needed). The \$165 is a package fee that includes both lift passes and lessons, although the lessons are optional. Students receive 1 wellness "activity" credit by participating for 20 hours of boarding. Class starts the 1<sup>st</sup> week of January. Students must register at the SLC front office (late October). Skiing can begin as early as 4 p.m. The class runs for six consecutive weeks. RIT does not provide transportation, but car pooling can usually be arranged. Directions are at the SLC. For more details call 475-7372 (instructor) or e-mail atsped@rit.edu. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-078****Soccer**

Soccer, the sport of the world, is a game of constant action. Each player involved in this game must be able to perform as an individual as well as be an essential part of team play. In this class, we will cover fundamentals of ball control, trapping, dribbling, passing, heading, shooting, defensive (zone, man-to-man) techniques, offensive techniques, goal keeping and soccer terms. We will also discuss how every team is comprised of individual skill, group skill and team tactics. Class format will follow a warm-up session with skill practice, instruction for the day and mini-games in a controlled scrimmage situation. Winter offering will be indoors. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-081****Softball**

This co-ed activity class is designed for beginner to advanced players of the game of slo-pitch softball. Class will meet outdoors on intramural softball field on the Turf Field, weather permitting. During inclement weather, class will meet in Clark gym and involve a modified game of softball, mullball. Course consists of basic fundamentals of slo-pitch softball with "speed up" rules of 3 balls and 2 strikes, including rules, outfield play, infield defensive skills, hitting, pitching techniques, base running, basic game strategies and umpiring. No metal spikes will be allowed. First class meets indoors and consists of orientation session and instruction regarding rules of the game. Most other classes will be outdoor drills and skill refinement. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-083****Swimming (Beginners)**

Participation, enjoyment, improvement, knowledge, fitness conditioning and safety, and the latest swimming information and techniques: Course includes individual and group instruction. Objectives involve work on skill improvement, safety development, all stroke recommendations, endurance improvement and swimming enjoyment. Course content delivers beginner, intermediate and advanced swimming skill work, freestyle, side, back, breast, fly and elementary backstroke. In addition to turns and variation, water orientation and entry, stroke mechanics, understanding fitness conditioning, games, diving and safety skills, students explore water enjoyment. Note: This is strictly a beginners class. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-087****Tennis (Outdoor, Indoor and Cardio Tennis)**

Participation, enjoyment and lifetime game appreciation fulfill class expectations. Introduction to fundamentals and skills will be covered. Objectives of the course include game skills, rules, etiquette, tennis appreciation and attaining a level of play that allows competition with comparable players. Court layout, surfaces, scoring, equipment, individual skills (forehand, backhand, serve, the volley, overheads) and footwork allow progression into preliminary games and round-robin play. Note: Indoor and Indoor Cardio Tennis are now offered in the winter and focus on tennis drills aimed at increasing cardiovascular strength/breathing and advanced footwork. Students will do circuit training, court positioning and continuous feeding drills. Strong tennis background is required. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-089****Volleyball**

This course is designed for all levels of players of the lifetime recreational and competitive game of volleyball. Course evaluation is based on attendance, effort, improvement and enthusiasm. The basic course outline includes instruction and rehearsal of basic volleyball skills (underhand pass, overhead pass, spike and serve); rules; basic formations/positions/strategies; and tournament play. Students will have ample time to practice/refine basic-advanced skills of the game. Tournament play will take place in the form of a random team selection from class to class. Students should dress in athletic wear, with comfortable sneakers and knee pads (if desired). Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-105****Curling**

This course will focus on the Olympic sport of curling, a competition between two teams with four players each. The game is played on ice, and the teams take turns pushing a 19.1kg stone towards a series of concentric circles. The object is to get the stone as close to the center of the circles as possible, scoring more points than the opposing team. Instruction will cover all rules, equipment, safety, basic to intermediate skills and competitions. All classes will meet off campus at the Rochester Curling Club, 71 Deep Rock Rd. (11 minutes from campus). RIT does not provide transportation. A course fee applies. For directions call 235-8246 or e-mail dhoffman@rochester.rr.com (instructor Dave Hoffman) or check www.rochestercurling.com. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-120****Inline Skating and Ice Skating**

This course is designed to introduce students to the sport of in-line skating and ice skating. Instructional emphasis will be on safely learning the lifelong activities of both sports. The first half of the course will focus on basic to intermediate ice-skating skills. The second part of the quarter will focus on the skills and enjoyment of in-line skating outdoors. Instruction will be given on skating basics: skating forward and backward, turning, crossovers and braking/stopping. Additional topics include discussions on the proper use of protective gear and proper maintenance of equipment. Students are required to provide their own set of in-line skates, helmets and wrist guards. Ice skates may be rented from the ice rink. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-130****Team Handball**

The verbal similarity between team handball and the more familiar "handball" played in a small court causes much confusion. The similarity of the two sports stops with the name. Team handball is played on a court like basketball. Each team has seven players—six court players and a goalie who plays both offense and defense. The basic objectives are to throw the ball into the goal of the opposing team and to defend one's own goal against attacks by the other team. Team handball is a rapid, continuous-play type of activity. Students will learn the rules, throws and basic strategies of the game while they develop cardiovascular fitness levels. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1111-140****Introduction to Sabre (Foil)**

Introduction to the sport of sabre: Basic moves, rules, knowledge and understanding in combination with conditioning principles, stretching and flexibility provide a class full of detail, competition and tactics. Objectives include basic footwork proficiency, fencing blade-work skills, rules understanding, experiential learning and the opportunity to direct (officiate) for one another. Classes begin with a light warm-up, followed by stretching and conditioning exercises. Focus on the basics and sabre moves also includes competition discussion and bout situations. Grading is on attendance. Final weeks include mini-competition, games, Olympic video and free sabre time. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check SIS for updated quarterly offerings and course updates. Note: An advanced section is offered during the spring quarter (strong background required). Check academic planning on SIS for updated quarterly offerings and course updates.

## Interactive Adventures

**1112-001** **Snowshoeing/Hiking**  
This class utilizes the sport of snowshoeing as a means of promoting and imparting physical fitness, outdoor preparedness, outdoor winter skills and knowledge of our local parks and natural resources. Students can expect to gain the necessary knowledge to continue enjoying this sport on their own. This class will typically meet at the Red Barn and depart for one of our many local trails and parks. In the event of a no-snow day, hiking will be the substitute activity. Equipment is provided by RIT. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-005** **Adirondack Snowshoeing**  
This class consists of a mandatory pre-trip meeting followed by a weekend trip to Adirondack State Park. Skills introduced include snowshoe use, cold-weather preparedness and backcountry travel. Attendance at both the pre-trip meeting and the weekend trip is required for full activity course credit. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-015** **Ice Climbing**  
This class is designed to teach basic ice climbing skills that include belaying, ice tool and crampon use and skills/safety considerations specific to climbing on ice. After the required pre-trip meeting, the class will take day trips to local frozen waterfalls for climbing. This class is appropriate for all experience levels, and all necessary gear and equipment is provided. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-016** **Ice Climbing/Adirondacks**  
This introduction to ice climbing will begin with a required pre-trip meeting (at the Red Barn) and then is followed by a trip to Adirondack State Park for a weekend of climbing. Skills covered will include proper and effective use of crampons, including front-pointing and French technique, ice-tool use, belaying and rope work, and general winter preparedness. This class is open to all skill levels. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-020** **Cross-Country Skiing**  
Cross-country skiing is one of the best fitness workouts around, burning 499 calories an hour while working all the major muscle groups (hamstrings, calves, quads, shoulders, arms, back and abdominals). This course is designed to provide a basic overview of the fundamentals. This fun, challenging lifetime activity is offered on campus during the winter quarter (weather permitting). The general course content addresses the following: equipment (skis, shoes, poles, clothing), proper technique (gliding), climbing hills, skiing downhill with cross-country skis and cardiovascular fitness benefits. Students must dress appropriately for the cold weather. All equipment will be provided by RIT, although students are encouraged to use their own equipment. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-050** **Rock Climbing/Indoor**  
This class is designed to educate students about the sport of indoor rock climbing. Subject matter includes a variety of climbing techniques, proper stretching and warm up, proper use of gear and equipment, and all safety practices related to indoor climbing. Each class will consist of demonstrations, short lectures, opportunities to practice what has been learned and time for free climbing. This class is appropriate for all experience levels. All necessary gear and equipment is provided. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-051** **Climbing Gyms Tour**  
This class meets for three day trips to different climbing gyms in the western New York and southern Ontario region. Skills taught/reviewed include: belaying with a "gri-gri," tying in and various other indoor climbing techniques/strategies that apply to the multitude of routes, features, boulder problems, caves and climbing walls that exist among the gyms visited. Students will also gain knowledge of where to go during the colder months to satisfy various climbing cravings. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-052** **Rock Climbing/Training for Climbers**  
This class is designed for those with climbing experience and strong fundamental climbing skills (technical knowledge of rope work or technical climbing experience is not necessary). This class will introduce a variety of specific climbing training methods and exercises. Students will have the opportunity to take advantage of the increased motivation and synergy of group training. All exercises will be climbing related and target such areas as contact (finger) strength, endurance, power, balance and the mental aspects of enhanced climbing ability. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-055** **Rock Climbing/Outdoor**  
This class is designed as an introduction to outdoor rock climbing. Subject matter includes a variety of climbing techniques, proper use of gear and equipment and safety practices related to outdoor climbing. Class consists of one evening session and an all-day trip. The evening session will acquaint classmates with each other, cover all rope handling and climbing techniques, and prepare the class for the outdoor trip. The trip usually takes place in Ontario, Canada, and transportation is provided. Here, students will have the opportunity to spend the day climbing on the cliffs of the Niagara Escarpment. All necessary gear is provided. You must attend the evening session to go on the trip, and both sessions are required for a passing grade. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-060** **Rock Climbing/Bouldering**  
Bouldering is the sport of climbing typically short distances without ropes or harnesses. These safety precautions are replaced with spotters and crash pads. This class is designed to expose students to the sport of bouldering while teaching a variety of climbing techniques, mental and physical preparedness, proper spotting and other areas of climbing safety. The first session(s) will meet at the Red Barn, and future sessions will take place in Niagara Glen bouldering area. All gear and transportation are provided. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-062** **Bouldering/Adirondacks**  
This course is designed to expose students to the sport of bouldering in an amazing outdoor setting. Climbing techniques, mental and physical preparedness, proper spotting and other areas of safety for climbing are presented. Bouldering involves shorter climbs, or "problems," that require more difficult movements than roped climbing. First class meets at the Red Barn (required meeting) followed by a weekend trip to the Adirondacks where students will climb for two days at a premier outdoor location. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-065** **Rock Climbing/Top-Rope Set-up**  
This class is designed to teach students how to assemble safe and reliable anchors for top-rope climbing using natural anchors (no artificial protection will be used). Participants should know how to belay and have some climbing experience. Skills taught will include: basic knowledge of all gear and equipment being used, choosing an anchor, tying off anchors, creating equalized and redundant anchor systems, anchoring the belay, redirected belays, top belays, escaping the belay and basic mechanical advantage systems. Class consists of one evening session and a full-day trip to Ontario, Canada, where participants will learn to set up and use their own climbs. Both sessions are mandatory. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-067** **Climbing/Technical Skills**  
This class is designed for those with some outdoor climbing experience. The class will be taught inside but in simulated outdoor situations, covering such skills as anchor building and management in a variety of situations; various belay methods and considerations; belay escapes and basic rescue skills; mechanical advantage and hauling systems; and safety and its many components in the climbing discipline. Climbing movement will be covered only inasmuch as it pertains to rope work and other technical considerations. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-080** **Backpacking**  
This class will impart basic backpacking skills such as fitting and properly packing your backpack, camping skills, and general outdoor awareness and preparedness. These skills will be put to use on an overnight backpacking/camping trip. The difficulty of the hike will be based on the abilities of the class. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-085** **Hiking/Adirondack Peak**  
This class meets for one evening session and one overnight trip. The evening session will cover acquainting the group, appropriate gear for the trip, outdoor preparedness and general expectations and logistics for the trip. The weekend trip will involve an attempt to hike one of the many peaks in the Adirondack region, weather and conditions permitting. Hiking is typically strenuous, but the abilities of the class participants and environmental conditions will dictate the nature of the hike chosen. Because of changing weather conditions and other unforeseeable factors, a peak may not be summited. Participants should possess dependable hiking boots and clothing. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-100** **Canoeing**  
This class meets for one preparation session and one full-day trip. The first session will cover acquainting the group, basic canoe/paddle parts and terminology, launching the canoe, paddle strokes and maneuvers, and basic canoeing safety with an opportunity to practice skills learned on flat or slow-moving water. The trip will be an all-day venture on moving water with sections of mild white water. Skills taught include: review of evening session skills and strokes/skills for negotiating moving water. Participants should expect to be on the water for both sessions. Both sessions are mandatory. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-120** **Kayaking/Rolling**  
This class is an introduction to kayaking. It is typically taught in the pool and covers the following skills: kayak parts, accessories and terminology; wet exits; hip snaps; paddle strokes; j-leans; Eskimo rescues, and Eskimo rolls. All skills are taught in progression using drills, games and exercises leading up to a full roll. This class is taught in whitewater kayaks. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-125** **Whitewater Kayaking**  
This course offers an intermediate approach to whitewater kayaking. The participants should have some, but not necessarily extensive, kayaking experience. A preliminary class meeting will take place in the RIT competitive pool. This meeting will address/review the basics of whitewater paddling, maneuvering, righting and rescue techniques. An all-day trip will follow on easy to moderate whitewater. The meeting and the class trip are required to receive full activity course credit. Additional skills taught will include: whitewater safety skills, river reading/navigation, ferrying, eddying and peeling. Depending on the skill level of the class, other more advanced skills may be introduced as well. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-150** **Wilderness Skills**  
This class will cover a variety of topics and is designed to impart a number of skills that pertain to safely and effectively enjoying the backcountry. Skills covered will include water treatment, bear bagging, camping skills, orienteering, backcountry first aid, environmental awareness and preparedness, wilderness ethic, and more. This class will be taught both in- and outdoors. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

**1112-155** **Camp Cooking**  
This is a hands-on course that focuses on the safe operation and practical use of a variety of camping stoves and other backcountry cooking methods to prepare meals in the backcountry. Topics covered will include: stove/method selection, safe and effective use of the chosen apparatus, backcountry nutrition and related considerations, water purification, meal planning and preparation, food dehydration methods, non-cooked nutrition options and a variety of other factors and considerations. Students will be given a lightweight camp stove to keep. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. There is a course fee. Check academic planning on SIS or visit the interactive adventures website at [www.interactiveadventures.rit.edu](http://www.interactiveadventures.rit.edu) for updated quarterly offerings and course updates.

## Martial Arts

**1113-020** **Cardiokickboxing**  
This fairly new and exciting course is designed to develop physical fitness, strength, stamina, power, speed, endurance and flexibility. Students will have the opportunity to develop self-defense skills by utilizing the combination of boxing and karate techniques. Instructors will introduce basic kicking and punching skills and combine the element of aerobic activity with music to provide an outstanding workout. Students will be encouraged to enhance their overall health, thus helping them look and feel good about themselves. Teaching methods include explanation, demonstration, program guidance and motivational lecturing. Students new to class must purchase training gloves (\$30) via the instructor. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1113-021** **Karate**  
This course is designed to help students increase their stamina, flexibility and basic techniques in self-defense. Main course objectives: become more physically fit to enhance self-esteem; develop self-confidence to help deal with everyday situations; relieve stress by providing an outlet to "blow off steam"; and gain self-discipline to develop better study, work and life habits. Course content: calisthenics, stretching, upper body/lower body exercises, kata (a prearranged set of movements that deal with being attacked). Course options include beginners, advanced, self-defense for women, sparring. Note: Advanced karate students **must** have successfully completed a beginning karate class before enrolling. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1113-022 Self-Defense for Women**  
This empowering self-defense course, exclusively for women, is designed to help students increase their stamina, flexibility and basic fundamental techniques to feel confident in the ability to protect themselves. In this positive, non-threatening environment, the class will teach proper use of hands and feet as weapons; how to fend off multiple attackers; and techniques that can be used against a person with a knife, gun or club. Main course objectives: become more physically fit, enhance self-esteem and gain necessary awareness of potential dangers, develop confidence and self-discipline to help deal with everyday situations, relieve stress, acquire resources needed to develop better study, work and life habits. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check SIS for updated quarterly offerings and course updates.

**1113-030 Kung Fu: Shaolin System (Self-Defense Applications, Rank-Test Review)**  
A typical class lasts between 1 to 2 hours, depending on the class, where all students work together. Most classes start with exercises, which are followed by the introduction of basic techniques and their application. Students can learn about philosophy, history, and analysis of Kung Fu techniques in the Review Class. Kung Fu provides an excellent method of getting in shape and students will feel a very definite improvement in overall well-being as they develop their offensive and defensive abilities. For more detailed information about the variety of class options check SIS system and/or visit: <http://www.rit.edu/~kungfu/>. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check Academic planning on SIS for updated quarterly offerings and course updates.

**1113-040 Tai Chi Chuan**  
This course is designed to be a soft and continuous martial art that can be practiced by individuals of any age and/or skill level, focusing on physical, mental and spiritual dimensions of human development. Students will learn to balance the body with gentle movements that improve health conditions with each progressive section. Tai chi was created 400 years ago and provides students with strong internal power as well as good external appearance. Students will be provided with instruction on the more free form of tai chi that expands knowledge, strength and capabilities, thus bringing them to the next level of progression. The basic format: history of tai chi; health benefits; warm-up exercises; movement from the Yang form; cool down; and use with special situations. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1113-050 Qigong**  
This martial arts course focuses on internal energy exercise based on practices from 2000 years ago. The powerful combination of slow movement, breathing, postures and meditation practices allows the body to open energy channels instantly, thus dramatically healing disease that conventional medicine has failed to overcome. Students will focus on using health energy to pursue success, peace and happiness. Basic course content: flying crane qigong (combines movement with mental concentration); fragrance qigong (repeats simple movements in specific frequency for maximal biophysical energy); and qigong meditation (involves applying physical pressure to transform bad energy to good) to heal at a subconscious state. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1113-060 Aikido**  
Aikido was founded by Master Morihei Uyeshiba as a synthesis primarily of aiki-jitsu, aiki-ken, judo and the founder's philosophy of peaceful reconciliation of conflict. One of the founder's students, Koichi Tohei Sensei, founded a branch school called the Ki Society, which emphasizes the development of personal "ki" through Aikido practice. RIT aikido traces its lineage back to the original Hombu dojo in Japan. The objective of this course is to provide physical conditioning by educating and coordinating the whole body-mind-spirit system. Basic ideas and techniques will be taught. The four basic principles to be presented: keep one point, relax completely, keep weight underside, and extend ki. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1113-061 Aikido: Bokken and Jo Aikido**  
"Bokken and Jo" emphasizes the study of aikido in a learning movement, timing and extending ki through an outside wooden object (the bokken or jo), as opposed to a "regular" aikido class, where students learn movement, timing and extending ki through themselves in response to a physical attack. The bokken and jo are weapons only in a traditional sense, not in a 21<sup>st</sup> century sense. A course in bokken and jo would actually be safer than the regular class in that no contact is allowed at all, and most of the study involves kata (a series of movements that a student does on his/her own, similar to a dance). The course is open only to those who have previously taken aikido (or an equivalent), as this is an advanced class. No mats are needed for this class. It is a highly disciplined, mentally challenging activity. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1113-070 Karate: Sparring**  
This exciting martial arts course is designed to help students increase their stamina, flexibility and basic techniques in self-defense, with emphasis on controlled fighting bouts (two students matching their skills against each other). Main course objectives: develop confidence through physical fitness, relieve tension by providing a healthy forum for stress relief and gain the self-discipline to enable students to lead a more productive life. Course content: calisthenics, stretching, and punching and kicking drills (including bag work and sparring with other students to promote the development of footwork, distancing timing, focus and strategies needed to be a skillful fighter). Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

**1113-090 Brazilian Capoeira**  
This exciting martial art course is one of the few, if not the only one still in existence, native to the Americas, developed in Brazil by the descendants of African slaves brought there by the Portuguese during the era of the Atlantic slave trade. Capoeira is characterized by dynamic body play, kicking, sweeping, takedowns, aggressive feinting and head-butt movements. It is played within a circle of onlookers and fellow participants called a "roda." The game is played when two contestants enter the circle and begin to "ginga" ("to swing" in Portuguese), launching various attacks and counters and initiating defenses. Class meets at Kim Murray's Karate Academy (shihanmurray@mmac.us). RIT does not provide transportation. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. A course fee applies. Check academic planning on SIS for updated quarterly offerings and course updates.

## Military Science

**1114-001 Air Force ROTC Physical Training**  
This course is designed to help individuals establish a physical readiness program. "Physical readiness" includes those factors that determine one's ability to perform heavy physical work and those that help maintain good health and appearance: muscular strength, muscular endurance and cardio-respiratory endurance. Major goals of the course are to physically challenge students and help them develop self-confidence, discipline and spirit. Students will work to develop physical readiness to a degree that will enable them to achieve or exceed the physical readiness standard established by the U.S. Air Force. Must be enrolled in RIT ROTC Air Force. There is no course fee. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. Multiple course completions count for multiple credits (e.g., three successful quarters equals three wellness activity credits). Check academic planning on SIS for updated quarterly offerings and course updates. (E, W, S)

**1114-002 Air Force ROTC/Physical Training (Leadership Lab)**  
This ROTC course, formerly Air Force Physical Training II, is designed to provide students with a foundational understanding of the benefits, privileges and opportunities, as well as responsibilities, associated with an Air Force commission. Students will also be introduced to Air Force customs, courtesies, environment, drill, flight movement and ceremonies. Prerequisite is enrollment in the RIT ROTC Air Force program. There is no course fee. Check academic planning on SIS for updated quarterly offerings and course updates.

**1114-010****Army Conditioning Drills**

This course is designed to help the individual establish a physical readiness program. "Physical readiness" includes those factors that determine one's ability to perform heavy physical work and that help maintain good health and appearance: muscular strength, muscular endurance and cardio-respiratory endurance. Major goals of course are to physically challenge students and help them develop self-confidence, discipline and spirit. Students will work to develop readiness to a degree that will enable them to achieve or exceed the physical readiness standard established by the U.S. Army. Evaluation will be obtained through the Army's physical readiness test. Must be enrolled in RIT ROTC Army. No course fee applies. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. Multiple course completions count for multiple credits (e.g., three successful quarters equals three wellness activity credits). Check academic planning on SIS for updated quarterly offerings and course updates.

**1114-011****Army Leadership Lab: ROTC**

Prerequisite: Enrollment in Army ROTC and successful completion of army conditioning drills. See section notes on SIS under the military sciences discipline, 1114 for more information on this required Army ROTC class. No course fee applies. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. Multiple course completions count for multiple credits (e.g., three successful quarters equals three wellness activity credits). Check academic planning on SIS for updated quarterly offerings and course updates. **(F, W, S)**

**1114-020****Navy Drill/ROTC/U of R**

This course is designed to help the individual establish a physical readiness program. "Physical readiness" consists of those factors that determine one's ability to perform heavy physical work and help maintain good health and appearance: muscular strength, muscular endurance and cardio respiratory endurance. Major goals of the course are to physically challenge students and help them develop self-confidence, discipline and spirit. Students will work to develop physical readiness to a degree that will enable them to achieve or exceed the physical readiness standard established by the U.S. Naval Sciences. Must be enrolled in U of R ROTC Navy. There is no course fee. Call 275-4275 at the U of R for more information. Successful completion of this course can be applied as 1 activity course credit toward the wellness graduation requirement. Multiple course completions count for multiple credits (e.g., three successful quarters equals three wellness activity credits). Check academic planning on SIS for updated quarterly offerings and course updates.