Desk Copy

COURSES

1978·79

Rochester Institute of Technology

Course Numbering

In addition to its title, each course is identified by two numbers.

The alpha-numeric course number directly to the left of the course title is the official Institute course number. This number will appear on grade reports, transcripts, and other official correspondence. This is what the alpha-numeric number means:

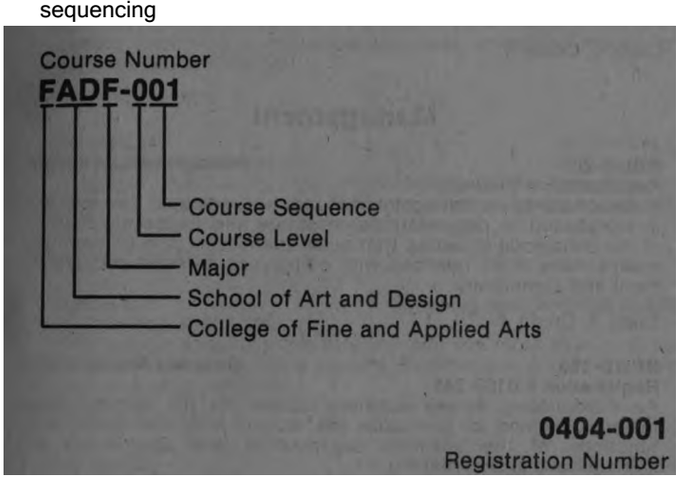
First letter: College offering the course

Second and Third letters: School or department of that college

Fourth letter: Major field of interest

First number: Course level: 0 = Non-credit, 1 = Diploma; 2 or 3 = Lower level degree courses; 4, 5 or 6 = Upper level undergraduate degree courses; 6, 7, or 8 = Courses for graduate credit. (6 may be undergraduate or graduate.)

Second and Third numbers: Course differentiation and sequencing



Directly below the alpha-numeric number in the course description is the registration number. You must use this number with a section number (i.e. 01, 02,) when you register for a course, because the alpha-numeric number cannot be read by the computer system.

Course prerequisites are shown in parenthesis after course descriptions.

Courses of Study 1978-79

Produced by RIT Communications

Rochester Institute of Technology
Office of Admission
One Lomb Memorial Drive
Rochester, NY 14623
(716) 475-6631

Table of Contents

In this catalog you will find course descriptions for all course offerings given by the day colleges, schools and departments of the Institute for undergraduate or graduate credit. The listing does not include courses provided by the College of Continuing Education, nor those courses specifically for students of the National Technical Institute for the Deaf. These are described in the separate Continuing Education catalog and the NTID bulletin.

For information about the colleges and programs of study at the Undergraduate level, please request the Undergraduate Bulletin; for further information about the colleges and programs at the Graduate level, please request the Graduate Bulletin from:

Rochester Institute of Technology
Office of Admission
One Lomb Memorial Drive
Rochester, New York 14623
or telephone 716-475-6631.

College of Business

School of Business Administration

Accounting

BBUA-210 **Financial Accounting**
Registration # 0101-210
Basic accounting principles and techniques within a framework of sound modern theory. Methods of accounting for revenues, costs, property and debt. Typical records for various types of business enterprise. Preparation and use of classified financial statements.

Class 4, Credit 4

BBUA-211 **Managerial Accounting**
Registration # 0101-211
The accounting function as a source of data for managerial decision making. Control of the operations of the firm is emphasized through the use of reports for internal and external consumption. Major emphasis is on the analysis of accounting data rather than on its collection. (BBUA-210)

Class 4, Credit 4

BBUA-215 **Survey of Accounting Concepts**
Registration # 0101-215
A course for non-business majors. An introduction to the purposes and functions of accounting in a dynamic society. Emphasis is placed upon essential financial and managerial accounting concepts necessary for management planning and control.

Class 4, Credit 4

BBUA-308, 309, 310 **Intermediate Accounting I, II, III**
Registration # 0101-308, 309, 310
A more advanced treatment of accounting theory and of accounting for proprietorships and corporations; determination of income realization and cost expiration; valuation of current and fixed assets and liabilities; funds and reserves; statement of changes in financial position. (BBUA-211)

Class 4, Credit 4

BBUA-420 **Cost Accounting**
Registration # 0101-420
Cost accounting with emphasis on uses of cost data and reports for managerial decision making. Includes problems and procedures relating to job order, process, and standard cost systems, with explanation of the techniques of overhead distribution. Special emphasis on the roles of controllers and their organization in finishing the accounting data and reports required for efficient managerial planning and control. (BBUA-211)

Class 4, Credit 4

BBUA-422 **Tax Accounting**
Registration # 0101-422
Presents basic tax law for an understanding of how it affects the taxpayer. Emphasizes federal income taxes, but also introduces social security, estate, and gift taxes; includes problems requiring the use of published tax services. (BBUA-310)

Class 4, Credit 4

BBUA-423 **CPA Problems**
Registration # 0101-423
A general view of accounting theory and practice designed both to assist students in preparation for the CPA examination and to review and improve their grasp of the various aspects and applications of accounting. Emphasis is on the analytical reasoning required in problem solving rather than on the solutions themselves. (Senior Standing)

Class 4, Credit 4

BBUA-504 **Auditing**
Registration # 0101-504
Auditing applied to both internal and professional practice; verification of original and final records; valuation of assets; liabilities, income, and net worth; audit reports, credit investigations, duties and responsibilities of the auditor. (BBUA-210 and senior standing)

Class 4, Credit 4

BBUA-505, 506 **Advanced Accounting I, II**
Registration # 0101-505, -506
The application of modern accounting theory to problems of advanced complexity. The student is made aware of the media for expression of current accounting thought. Topical coverage includes consolidated financial statements, partnerships, estates and trusts, government and not-for-profit entities and an introduction to alternate accounting theories. (BBUA-310 and senior standing)

Class 4, Credit 4

BBUA-554 **Seminar in Accounting**
Registration # 0101-554
A seminar series covering selected topics in accounting, including management accounting, taxation, international accounting and accounting for non-profit organizations. Specific course topics to be announced when seminar is offered. (Permission of instructor)

Class 4, Credit 4

Management

BBUB-201 **Management Concepts**
Registration # 0102-201
A basic course in management theory and practice. The student is introduced to organizational structure and to the application of the behavioral sciences. Particular attention is paid to management's roles in its relations with employees, ownership, government and community.

Class 4, Credit 4

BBUB-245 **Business Management**
Registration # 0102-245
An introductory survey business course for the non-business major. Designed to familiarize the student with the nature and functions of the business organization and approaches to managerial decision making.

Class 4, Credit 4

BBUB-301, 302 **Business Law I, II**
Registration #0102-301, 302
An introduction to legal principles and their relationships to business practices. Topical cases and examples are used as a guide to the observation of legal requirements, the avoidance of infractions, the utilization of professional services, and for familiarity with legal nomenclature.

Class 4, Credit 4

BBUB-401 **Behavioral Science in Management**
Registration #0102-401
Application of the behavioral sciences to management's problems in human relations. Emphasis on developing the student's understanding of the relationships existing among employees. (BBUB-201 or permission of instructor)

Class 4, Credit 4

BBUB-404 **Administrative Policy**
Registration #0102-404
Applications of management principles and processes to problem solving. An integrated viewpoint on business operations by analysis and evaluation of actual cases. Course is intended to develop the student's competence in decision making. (BBUB-401, BBUB-434, BBUF-441, BBUM-263 and Senior Standing)

Class 4, Credit 4

BBUB-407 Legal Environment of Business Activity
Registration #0102-407
The impact and effect of law on any and all activities dealing with business or economic activity of individuals, business entities, governmental agencies, employers and employees. (BBUB-201)

Class 4, Credit 4

BBUB-434 Operations Management
Registration #0102-434
Theory and practice of operations management utilizing quantitative methods and computer techniques as applied to business problems. (BBUQ-352 or BBUQ-411, ICSS-200)

Class 4, Credit 4

BBUB-450 Multinational Management
Registration #0102-450
Acquaints the student with the characteristics and impact of the multi-nation enterprise. It explores in depth the process of leadership, motivation and performance appraisal in a cross-cultural setting. (BBUB-201 and BBUB-401)

Class 4, Credit 5

BBUB-531 Labor Relations
Registration #0102-531
The past and present of the American labor movement are discussed, including union philosophy and objectives, issues and approaches. (BBUB-201)

Class 4, Credit 4

BBUB-534 Purchasing
Registration #0102-534
Industrial purchasing, the organization of the function, the methods of procurement, purchasing policies, sources of supply, and legal aspects of purchasing are covered.

Class 4, Credit 4

BBUB-535 Planning and Decision Making
Registration #0102-535
This course acquaints the student with the most important task of the executive: decision making. Emphasis is placed on quantitative, logical methods.

Class 4, Credit 4

BBUB-536 Organization Theory
Registration #0102-536
Modern methods of organization including the task, structure, and behavior of organizations are presented. Current concerns such as centralization vs. decentralization, and the effects of automation are analyzed. (BBUB-201)

Class 4, Credit 4

BBUB-554 Seminar in Management
Registration #0102-554
A seminar series covering selected topics in current management problems. Specific course topics to be announced when seminar is offered. (Permission of instructor)

Class 4, Credit 4/Qtr. (maximum 12 credits allowed)

Economics

BBUE-381 Money and Banking
Registration #0103-381
Analysis of money, credit, and financial system. Banking operations and the money supply process. The business of commercial banking and the act of central banking. Central bank activities in relation to national and international monetary policies. (BBUA-210, GSSE-302)

Class 4, Credit 4

BBUE-405 Microeconomics
Registration #0103-405
A course in economic theory at an intermediate level dealing with the contemporary analysis of price and distribution under conditions of free competition and various degrees of monopoly control. Business applications are given along with the exposition of the theory itself. (GSSE-302, BBUQ-292 or BBUQ-411)

Class 4, Credit 4

BBUE-406 Macroeconomics
Registration #0104-406
The course is concerned with the overall performance of the economy. It deals with the aggregate analysis of saving and investment, the level of income, the level of employment, and the level of prices. Governmental monetary and fiscal policies will also be evaluated. (GSSE-302, BBUQ-292 or BBUQ-411)

Class 4, Credit 4

BBUE-407 Managerial Economics
Registration #0103-407
Analysis of the firm. Problems facing management: economizing in the use of resources, optimal combinations of products, pricing, competitive forces in markets affecting the firm. (BBUE-405)

Class *i,* Credit 4

BBUE-408 Business Cycles and Forecasting
Registration #0103-408
Analysis of economic conditions affecting the firm. Theory of business fluctuations. Forecasting techniques and services available to the firm. (BBUE-406)

Class 4, Credit 4

BBUE-443 Recent Economic Policies
Registration #0103-443
A seminar type course on recent monetary and fiscal policies in the United States. Topics will cover the economic background, nature and effects of the policies during the most recent 10-year period. (BBUE-381)

Class 4, Credit 4

BBUE-509 Advanced Money and Banking
Registration #0103-509
Development of monetary theory. Money and income: theories of interest, liquidity preference and loanable funds: theories of income and employment, Keynesian and neo-Keynesian approach. Money and prices: quantity theory, velocity and cash-balance approach; inflationary process; and money wage rates and prices. (BBUE-381)

Class 4, Credit 4

BBUE-530 Labor Economics
Registration #0103-530
A course in applied economics, using economic theory and analysis for the study of labor institutions and their relation to the economy as a whole. Topics include wage theory, supply and demand forces of labor, wages and unions, unemployment, inflation and public policy. (BBUE-405)

Class 4, Credit 4

BBUE-554 Seminar in Economics
Registration #0103-554
Investigation of advanced problems and policies in economics. Emphasis is on student reports and papers. (Permission of instructor)

Class 4, Credit 4

Finance

BBUF-441 Financial Management
Registration #0104-441
A management oriented approach to the finance functions of a corporation. The application of decision making techniques and the analysis of existing legal and economic constraints on the financial manager. An introduction to the basic models and concepts relative to working capital management, capital budgeting, cost of capital and risk analysis. (GSSE-301, 302 and BBUA-210)

Class 4, Credit 4

BBUF-502 Money and Capital Markets
Registration #0104-502
Description and analysis of the money and capital markets, including underwriting and the placement of new issues and the functioning of the secondary markets. This will include U.S. governments, tax exempt securities and corporate issues as well as the short term money markets. (BBUE-381)

Class 4, Credit 4

BBUF-503 **Financial Problems**
Registration #0104-503
An examination of problems encountered in many areas of corporate finance. The emphasis is on analytical and decision making techniques used to develop acceptable solutions. The case approach is used extensively. (BBUF-441)

Class 4, Credit 4

BBUF-504 **International Finance**
Registration #0104-504
This course is concerned with the monetary aspects of international economic relations. It deals with the following topics: the balance of payments, foreign exchange rates and markets, gold standard, flexible exchange rates system, international capital movements, exchange restrictions, and international monetary experience. (BBUE-381)

Class 4, Credit 4

BBUF-507 **Security Analysis**
Registration #0104-507
The course is introductory and provides background in the field of securities investment. It is both descriptive and analytical in nature. The course coverage emphasizes the securities markets, types of issues, the historical investment perspective, and the valuation of different types of securities. (BBUF-441)

Class 4, Credit 4

BBUF-508 **Portfolio Management**
Registration #0104-508
This course deals with the considerations involved in the construction and management of securities portfolios. The emphasis is on the requirements of the institutional investor, the examination of the efficient market hypothesis, modern portfolio theory, and the valuation of investment results. (BBUF-507)

Class 4, Credit 4

BBUF-510 **Financial Institutions**
Registration #0104-510
Analysis of the different kinds of financial institutions such as commercial banks, savings institutions, insurance companies, pension funds, and others. It will cover their operations and relationships with the economic system. (BBUE-381)

Class 4, Credit 4

BBUF-554 **Seminar in Finance**
Registration #0104-554
A seminar covering current policies and problems in financial management, and/or securities and security markets. (Permission of instructor)

Class 4, Credit 4 (maximum 12 hours credit)

Marketing

BBUM-263 **Marketing Principles**
Registration #0105-263
A basic course in which the student is introduced to the marketing system and specific marketing functions of the business firm. An analytical approach is used to develop an understanding of marketing strategy. (BBUA-210, GSSE-302)

Class 4, Credit 4

BBUM-420 **Consumer Behavior**
Registration #0105-420
A course focusing on the role of the ultimate consumer in the marketing process. Emphasis will be on understanding the psychological, cultural and socioeconomic influences in the consumer decision making process. (BBUM-263)

Class 4, Credit 4

BBUM-510 **Consumer Services Analysis**
Registration #0105-510
A course designed to examine the common attributes and problems of consumer service institutions. Topics to be covered: factors of market segmentation, customer needs, models of present and future service organizations, organizational concerns, and external environmental variables affecting consumer service industries. (BBUM-263)

Class 4, Credit 4

BBUM-511 **Consumer Services Seminar**
Registration #0105-511
A course designed to explore the current problems and opportunities of service industries, including an analysis of external environmental variables and their impact (BBUM-510)

Class 4, Credit 4

BBUM-550 **Marketing Management Problems**
Registration #0105-550
A course designed to provide the student with an in-depth knowledge of middle and upper management level marketing problems. In addition, the student should become familiar with tools used by marketing managers at these levels. (BBUM-552, 553)

Class 4, Credit 4

BBUM-551 **Marketing Research**
Registration #0105-551
A study of research methods and procedures used in the marketing process. Topics include problem formulation, sources of market data, research methodology, data collection, data analysis, and the role of marketing research within the firm. (BBUM-263, BBUQ-352 or BBUQ-411)

Class 4, Credit 4

BBUM-552 **Advertising**
Registration #0105-552
The role of advertising as a vital function of the marketing field. Material will be studied from the point of view of the manner in which advertising contributes to the marketing mix, rather than from the creative aspects of production and copy. (BBUM-263)

Class 4, Credit 4

BBUM-553 **Sales Management**
Registration #0105-553
The course emphasizes the sales function of marketing management. It centers around the problems managers face in the direction, control, and supervision of sales activities. (BBUM-263)

Class 4, Credit 4

BBUM-554 **Seminar in Marketing**
Registration #0105-554
The objective of this course is to enable the student to bring together interests, learnings and experiences obtained in previous marketing courses. Specific course content will vary. (Permission of instructor)

Class 4, Credit 4 (maximum 12 hours credit)

BBUM-555 **International Marketing**
Registration #0105-555
Management problems of marketing in foreign countries. Topics to be considered include the economic, cultural, and political roots of marketing systems. (BBUM-263)

Class 4, Credit 4

BBUM-556 **Marketing Logistics**
Registration #0105-556
A study of physical supply and physical distribution activities. Topics include transportation, inventory control, materials handling, warehousing, order processing, protective packaging, product scheduling, facility location and customer service. (BBUM-263, BBUB-201)

Class 4, Credit 4

BBUM-557 **Comparative Marketing**
Registration #0105-557
A study of marketing in selected foreign countries to acquaint the student with its functional role in various economic environments. Comparisons between geographic regions and cultural settings are explored. (BBUM-555)

Class 4, Credit 4

Quantitative Methods

BBUQ-290 **Algebra**
Registration #0106-290
A review of the fundamental concepts and operations of algebra that are necessary for BBUQ-291 and other quantitative courses. Topics include relations and functions, rational expressions and equations, special products and factoring, linear and quadratic equations, systems of linear equations, powers and roots, and logarithms.

Class Variable, Credit 4

BBUQ-291, 292 **Mathematics I, II**
Registration #0106-291, 292
The mathematical background required for the increasing use of quantitative methods in management. Topics include coordinate geometry, functional relationships, and the fundamental concepts and methods of differential and integral calculus.

Class 4, Credit 4

BBUQ-351, 352 **Statistics I, II**
Registration #0106-351, -352
Interpretation and application of statistical techniques in business, to develop the ability to evaluate the results of statistical research. Introduces student to basic techniques of summarizing and presenting data, probability theory, hypothesis testing, regressions and correlation and non-parametric statistics as applied to management decision making. (BBUQ-291)

Class 4, Credit 4

BBUQ-353 **Statistics III**
Registration #0106-353
Introduces the student to the techniques of rational decision making under conditions of uncertainty and variability. The problem of determining the optimal amount of sampling is also considered. (BBUQ-352 or permission of instructor)

Class 4, Credit 4

BBUQ-410 **Quantitative Methods I**
Registration #0106-410
Fundamental mathematical principles and techniques used in management decision making. Topics include Cartesian coordinates and graphs; algebraic, exponential and logarithmic analysis; partial derivatives and applications; introduction to integral calculus.

Class 4, Credit 4

BBUQ-411 **Quantitative Methods II**
Registration #0106-411
Statistics for transfer students. A review of statistics covering descriptive statistics, probability, probability distribution, sampling, estimation, significance testing, and regression and correlation analysis. (BBUQ-410)

Class 4, Credit 4

BBUQ-481 **Mathematics**
Registration #0106-481
Applications of quantitative methods in business decisions: linear and quadratic optimization techniques, using pre-calculus mathematics. Computer demonstrations will be used where possible. (BBUQ-352 or BBUQ-411)

Class 4, Credit 4

Food Administration and Tourist Industries Management

Dietetics

BFAD-213 **Nutrition Principles**
Registration #0107-213
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. (BFAM-215)

Class 4, Credit 4

BFAD-314 **Sanitation & Safety in Hospital**
Registration #0107-314 **Food Service Operation**
(Coordinated Dietetics Program)
Survey of micro-organisms of importance to the food industry; emphasis on causes and prevention of food spoilage and poisoning. Responsibilities of administrative dietitians to provide and establish safe working conditions and policies; discussion of current problems confronting the hospitals as a result of recent legislative developments as they relate to safety and health. (BFAM-311)

Class 2, Credit 4
Practicum in hospital by arrangement.

BFAD-402 **Dietetics Environment**
Registration #0107-402 **(Coordinated Dietetics Program)**
Introductory dietetics course for students to interact and communicate with a representative sampling of the various categories of personnel in the general field of dietetics to study all major components of a total system in which a registered dietitian might function.

Class 1, Credit 4
Clinical hours by arrangement.

BFAD-519 **Educational Principles and Methods**
Registration #0107-519
Principles of learning: behavioral objectives, motivation, perception, evaluation, guidance, teaching methods and audiovisual techniques; development of a teaching/learning unit for a specific group.

Class 4, Credit 4

BFAD-520 **Communication & Instructional Techniques**
Registration #0107-520 **(Coordinated Dietetics Program)**
Principles of communication and learning applied to educational programs; study of individual differences, perception, motivation, guidance and evaluation in basic concepts of education; use of television, visual equipment, and teaching materials for training programs for hospital employees.

Class 2, Credit 4
Practicum in hospital by arrangement.

BFAD-525, 526 **Advanced Nutrition and Diet Therapy I & II**
Registration #0107-525, -526
Biological metabolism and interrelationships of nutrients, enzymes, and other biochemical substances in humans. Etiology, symptoms, treatment and prevention of nutritional diseases; evaluation of nutritional diseases; evaluation of nutritional status. Role of diet and dietetics in metabolic gastro-intestinal, renal, musculoskeletal, cardiac, endocrine, febrile, and other diseases. (BFAD-213, SCHG-203, SBIG-212)

BFAD-525 Class 5, Credit 5
BFAD-526 Class 4, Credit 4

BFAD-535 **Nutrition Seminar**
Registration #0107-535
Study of nutrition research; reading in scientific literature; evaluation of nutrition information and education in the local community, the nation, and the world; development of a research project, written and oral presentation of report. (BFAD-213, BFAD-526 and senior standing)

Class 4, Credit 4

BFAD-550 **Community Nutrition**
Registration #0107-550
Study of current nutrition problems in the community. Survey of agencies involved in giving nutrition information to the public and/or nutritional care to groups. An independent study project involving nutrition care in a clinical facility in the community is required. Assignments are arranged by the instructor. (BFAD-213, BFAD-526)

Class 2, Credit 4
Clinical hours by arrangement

BFAD-551 **Management of Food Systems**
Registration #0107-551 **(Coordinated Dietetics Program)**
Principles of management in organizational structure, supervision and evaluation of employee performance, and use of computers in food management; the functions of an administrative dietitian in planning, organizing, directing, coordinating, and controlling dietetic activities.

Class 1, Credit 4
Practicum in hospital by arrangement

BFAD-554 **Seminar in Dietetics**
Registration #0107-554
A seminar series covering selected current topics in the professional field of dietetics.

Class and Credit Variable

BFAD-560 561 **Clinical Dietetics I & II**
Registration #0107-560, 561 (Coordinated Dietetics Program)
An intensive integrated study and application of advanced nutrition and diet therapy theories and principles. The course is structured to integrate class lectures (BFAD 560) with clinical experience (BFAD-561) in a hospital setting. Designed for senior students in the Coordinated Dietetics Program. (BFAD-213, SCHG-203, SBIO-305)

BFAD-560 — Class 4, Credit 4
BFAD-561 — Clinical Hours by Arrangement, Credit 4

BFAD-562 563 **Clinical Dietetics III & IV**
Registration #0107-562, -563 (Coordinated Dietetics Program)
A continuation of BFAD-560, 561 in the succeeding quarter with the clinical experience being conducted in another hospital. (BFAD-560, 561)

BFAD-562 — Class 4, Credit 4
BFAD-563 — Clinical Hours by Arrangement, Credit 4

Food and Tourist Industries Management

BFAM-210 **Introduction to Food Management and**
Registration #0108-210 **Tourist Industries**
An orientation course designed to trace the history, organizational structure, problems, opportunities and the place of the industry in the national and world economy. Trends and developments in the industry today are stressed.

Class 3, Credit 3

BFAM-215 **Food Principles**
Registration #0108-215
Introduction of foods and basic preparation of high quality food products. Topics include history, kinds, varieties, seasonal availability, sources, and composition of foods and ingredients; essential vocabulary; organization and management of work area; techniques and methods used for menu planning.

Class 3, Lab. 6, Credit 5

BFAM-220 **Career Seminar**
Registration #0108-220
Seminar designed to define career opportunities in the food, hotel and tourist industries. Students will be aided in developing career objectives. Leading industry executives will participate.

Class 1, Credit 1

BFAM-310 **Mankind in Search of Food**
Registration #0108-310
Survey of foods including composition of foods, basic principles of nutrition, food spoilage, food poisoning, modern food processing, “health foods,” world food problems and their possible solutions, with emphasis on practical application to daily food selection and composition. (Not open to those who have completed BFAD-213)

Class 4, Credit 4

BFAM-311 **Food Systems Design**
Registration #0108-311 **&Equipment Layout**
Recognizing, analyzing and solving equipment and space problems in layouts of existing institutions and in designing new food service plans. Consideration of food service equipment; determination of needs; development of specifications; procedures of maintenance, sanitation, and safety. (BFAM-215)

Class 3, Lab. 2, Credit 4

BFAM-314 **Sanitation and Safety In**
Registration #0108-314 **Food Operations**
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. (BFAM-311)

Class 2, Credit 2

BFAM-321 **Food and Beverage Merchandising**
Registration #0108-321
Recognizing, analyzing, researching and solving fundamental merchandising techniques including menus for food and beverages found in the food service industry. (BFAM-215)

Class 2, Credit 2

BFAM-331, 332 **Food Production Management I & II**
Registration #0108-331, -332
Application of standards, specifications, principles and techniques of equipment selection, purchasing and preparation in quantity and service of high quality food. Recognizing, analyzing, solving and evaluating problems related to all aspects of quantity food production and management based upon scientific, technological, economic, and social factors. Emphasis on operation and maintenance of food service equipment. Application of purchasing principles and cash control; work simplification; planning and scheduling. Students in Coordinated Dietetics Program will have hospital practicum arranged in BFAM-332. (BFAM-215)

BFAM-331 Class 3, Lab. 6, Credit 5
BFAM-332 Class 2, Lab. 6, Credit 4

BFAM-333 **Operational Analyses in Food Systems**
Registration #0108-333
This course will deal with industry related problems which will combine classroom study of the fundamental principles of Cost Controls, as applied by management, with on-location application of financial practices and specialized accounting procedures in solving cost and management problems in the food and beverage operations. (BFAM-332)

Class 4, Credit 4

BFAM-415 **Food Science I**
Registration #0108-415
Consideration of fundamental chemical and physical reactions, the influence of kind and proportion of ingredients; evaluation of food products by sensory and objective methods. Open only to junior and senior students. (BFAM-212)

Class 2, Lab. 6, Credit 4

BFAM-416 **Food Science II**
Registration #0108-416
Individual study concerning chemical and physical reactions in foods; the influence of kind and proportion of ingredients, with special emphasis on experimental design for problem solving and on written and oral communication skills. (BFAM-415)

Class 1, Lab. 8, Credit 4

BFAM-422 **Hotel/Motel Management**
Registration #0108-422
A study of methods, techniques, and tools of management used in the development and operation of hotels and motels, including ethics and policies.

Class 4, Credit 4

BFAM-423 **Management Systems for the**
Registration #0108-423 **Lodging and Tourism Industry**
Analysis and evaluation of systems and operations, franchising; feasibility planning, development, financing and organization of facilities; rate structure determination, front office procedures, guest room salesmanship and analysis of demand; reservation systems, ethics, security and on-the-job application of operational problems. (BFAM-210)

Class 4, Credit 4

BFAM-425 **Introduction to the Tourist Industry**
Registration #0108-425
Evolution of tourism as an industry geographically and culturally; the economic role of tourism, tourism demand, tourism organizations, planning and development; managerial requirements.

Class 4, Credit 4

BFAM-450 **Marketing for Hotel and**
Registration #0108-450 **Tourism Industries**
A study of tourism development, marketing and the interaction between the broad areas of the travel industry and its relationship to hotels, motels, restaurants, community economy, trade associations, competitive and non-competitive markets. (BBUM-263)

Class 4, Credit 4

BFAM-511 **Advanced Food Service Operation**
Registration #0108-511
Management experience in planning, organizing, supervising preparation and service of foods for special functions. Emphasis is placed on experiences in organizational behavior, the responsibilities of management in marketing, promotion, sales production, personnel and customer relations and attitudes. Evaluation of management experience by preparation of operations reports. (BFAM-331, 332)

Class 1, Lab. 8, Credit 4

BFAM-517 **Ethnic Foods**
Registration #0108-517
Study of regional and international foods and food customs of peoples of various backgrounds.

Class 4, Credit 4

BFAM-554 **Seminar in Tourist Industries**
Registration #0108-554 **Management**
Selected management problems associated with hotels, motels, resorts and travel systems. To develop analytical and decision making ability.

Class 4, Credit 4

BFAM-555 **Research Problems**
Registration #0108-555
Independent study of research problems in food and hospitality management. Open to senior students only.

Class and Credit Variable

School of Retailing

BRER-211 **Retail Organization and**
Registration #0109-211 **Management**
This survey course is a basic orientation to the field of retailing. Emphasis is placed on the major store functions of merchandising, sales promotion, control, operations, and personnel. The activities of each of these areas and their interrelationships are considered.

Class 4, Credit 4

BRER-212 **Principles of Merchandising**
Registration #0109-212
An examination of the merchandising function with particular attention to the role of the store buyer. Topics include buying and pricing merchandise, operating statements, mark-up, and open-to-buy. Emphasis is placed on the retail mathematics associated with these topics. (BRER-211)

Class 4, Credit 4

BRER-300 **Retail Career Seminar**
Registration #0109-300
A fundamental course to assist the student in establishing a sound basis for profiting by the Co-op work experience and making career decisions. Major areas covered are: self awareness and aptitude testing, resume and letter writing techniques, sources of job opportunities, and interviewing procedures.

Class 1, Credit 1

BRER-410 **Retail Sales Promotion**
Registration #0109-410
A study of the sales promotion function of a retail store. Basic philosophies, planning, budgeting, use of media and market coverage are stressed. Two major activities, public relations and retail advertising, are examined with emphasis on the retail advertising function. Students are introduced to techniques used in creating newspaper advertising. (BRER-211)

Class 4, Credit 4

BRER-435 **Advanced Merchandising**
Registration #0109-435
An examination of the merchandising task and its related decision structure. The course will stress the task of selecting merchandise to meet considerations of both customer preferences and business profitability. The proper utilization of records for planning, merchandising, and control of a retail enterprise will be covered. Students will be able to apply their co-op experiences in a guided decision oriented framework. (Senior Standing; BRER-212)

Class 4, Credit 4

BRER-511 **Basic Textiles**
Registration #0109-511
Analysis of textile fibers, weaves, and fabrics; methods of printing, dyeing and finishing; evaluation of fabrics and materials commonly used in home furnishing.

Class 4, Credit 4

BRER-521 **Fashion History**
Registration #0109-521
Survey of the apparel arts from ancient times to the present. Study is made of the social, political, and economic factors influencing styles and merchandising of apparel throughout the ages and how history influences fashion today.

Class 4, Credit 4

BRER-523 **Current Fashion**
Registration #0109-523
A study of the present-day fashion industry including development of the production of fashion goods. European designers and **the** operation of the Parisian couture are surveyed in addition to **the** American fashion industry and American designers.

Class 4, Credit 4

BRER-524 **Fashion Accessories**
Registration #0109-524
Determination of quality, value, and selling points. Government regulations for leather goods, shoes, gloves, handbags, furs, luggage, jewelry, cosmetics, umbrellas, wigs, and other accessories; information necessary for selection and merchandising.

Class 4, Credit 4

BRER-531 **Basic Interior Design**
Registration #0109-531
A study of the basic elements and principles of design. A variety of art media and techniques are explored as applied-to interior design.

Lab. 8, Credit 4

BRER-532 **Interior Design I**
Registration #0109-532
Planning the home and its furnishings, with special attention to functional space arrangement; application of concepts of abstract design to the utilitarian object; presentation of plan showing selection of furnishings and colors.

Class 2, Lab. 4, Credit 4

BRER-533 **Interior Design II**
Registration #0109-533
Development of a functional plan for the interior; selection of merchandise and architectural materials; presentation of plan by means of elevations, perspective, renderings, or model; exploration of media for presentation; field trips. (BRER-532)

Class 2, Lab. 4, Credit 4p

BRER-534 **Interior Design History**
Registration #0109-534
A study of architecture and furnishings as expressive of social, economic, political, and technological developments. Emphasis on significant and lasting design developments from each period. This course covers the history of interior design from antiquity through the present (BRER-533)

Class 4, Credit 4

BRER-535 **Advanced Interior Design**
Registration #0109-535
Continuation of Basic Interior Design, BRER-531.

Lab. 8, Credit 4

BRER-545 **Color and Design**
Registration #0109-545
Basic principles of design, color harmonies, associations and color schemes as they apply to both apparel and home furnishings. Practical application of these principles to determine the level of good taste.

Class 4, Credit 4

BRER-554 **Seminar in Retailing**
Registration #0109-554
Selected topics associated with various aspects of retailing. Course content and structure will differ according to faculty assigned and quarter when offered. (Permission of instructor)

Class 4, Credit 4/Qtr. (maximum 12 credits allowed)

Graduate Business Courses

Business Administration courses

Accounting Group

BBUA-701 **Financial Accounting**
Registration #0101-701
An introduction to financial accounting. Topics covered will include: financial statements; transaction analysis; accounting for revenues, costs, and expenses; accounting for assets, liabilities and owner's equity; measurement; and the use of financial statements.

Credit 4

BBUA-702 **Cost and Managerial Accounting**
Registration #0101-702
Emphasizes the uses of cost data and reports for managerial decision making. Includes problems and procedures relating to job order, process, and standard cost systems with special attention to problems of overhead distribution. The planning process, the control process, and analytical processes are considered in detail. (Foundation courses)

Credit 4

BBUA-704 **Accounting Theory I**
Registration #0202-704
Theory and practice of accounting for assets based upon the latest pronouncements of the APB and FASB. Study of alternative valuation systems and their impact on income and financial position is the central focus of each asset category as it is studied In detail. (Foundation courses)

Credit 4

BBUA-705 **Accounting Theory II**
Registration #0101-705
Continuation of Accounting Theory I with emphasis on liabilities, equity, long-term debt and special reporting problems. Included here is the Statement of Changes in Financial Position, pensions, leases, and accounting for changes in the price level. (BBUA-704)

Credit 4

BBUA-707 **Advanced Accounting and Theory**
Registration #0101-707
Analysis and evaluation of current accounting thought relating to the nature, measurement and reporting of business income and financial position; concepts of income; attention to special areas relating to consolidated statement, partnerships, consignments and installment sales. (BBUA-705 or admission to MS program)

Credit 4

BBUA-708 **Auditing**
Registration #0101-708
The theory and practice of advanced public accounting are examined; critical study of auditing procedures and standards in the light of current practice; measurement and reliance of internal control covered by case studies; modern day auditing techniques by statistical sampling and electronic data processing applications. (BBUA-705 or admission to MS program)

Credit 4

BBUA-709 **Basic Taxation Accounting**
Registration #0101-709
A study of the basic field of federal income taxation is undertaken emphasizing its importance in business decisions and policies: application of income taxation to individuals, partnerships, and corporations is examined; income tax and accounting concepts affecting revenues and deductions are compared, including concepts of gross income, basis, recognition of gain and loss, capital asset transactions, exemptions and deductions. (Foundation courses or admission to MS program)

Credit 4

BBUA-710 **Advanced Taxation Accounting**
Registration #0101-710
A study of federal income taxes with special emphasis on corporate tax problems affecting business decisions and policies, including corporate reorganizations, personal holding companies, dividends, liquidations, capital gains transactions, federal gifts and estate taxes; tax planning and management. (BBUA-709 or admission to MS in accountancy)

Credit 4

BBUA-712 **Seminar In Accounting**
Registration #0101-712
Course content will differ by instructor and quarter. Topics covered: taxation, international accounting and accounting for non-profit organizations (Permission of director of Graduate Programs)

Credit 4

Business group

BBUB-741 **Management and Organization**
Registration #0102-741
Analysis and description of management principles and processes from the classical and behavioral viewpoints. Study of organizations and organizational change from the structural, systematic, and humanistic perspectives. Text and reading of original sources supplemented by case analysis and/or research paper. (Foundation courses)

Credit 4

BBUB-742 **Business and Society**
Registration #0102-742
A study of the impact on the manager of the needs, demands and restrictions posed by employees, government, the consumer and other environmental forces. The course examines possible managerial responses within the framework of several definitions of "social responsibility." (Foundation courses)

Credit 4

BBUB-743 **Operations Management**
Registration #0102-743
An analytical approach to the theory and application of operations management. Combines quantitative models and qualitative considerations relating to forecasting, inventory management, quality control, and queuing analysis. Statistical reasoning and computer utilization are basic tools in problem solution. (Foundation courses)

Credit 4

BBUB-744 **Behavioral Science in Management**
Registration #0102-744
The implications of studies from the fields of psychology are discussed; problems in perception, motivation, social interaction, group dynamics, attitudes and values are stressed. Lecture, discussion, case studies and emphasis on critical analysis and interpretation of original research readings.

Credit 4

BBUB-746 **Seminar in Management Development**
Registration #0102-746
Concepts of individual development; overview of present individual and group procedures; implications of current technological development for training, replacement, and advancement. (BBUB-741)

Credit 4

BBUB-747 **Systems Administration**
Registration #0102-747
General systems theory applied to the management of business systems. Topics covered include philosophy of systems, design, analysis and control of systems, cybernetics, project management, reliability, and human factors. (Foundation courses)

Credit 4

BBUB-748 **Labor/Management Problems**
Registration #0102-748
Problems in labor/management relations as they influence managerial decision making. Topics may include collective bargaining, conflicts and agreements between labor and management, and contemporary issues. From the perspective of labor/management structure, concepts are developed concerning market forces, unionism and labor law as they influence wage levels and wage structure. (Foundation courses)

Credit 4

BBUB-7S0 **Personnel Systems**
Registration #0102-750
This course introduces the concept of personnel systems and allows a detailed examination of the systems' different elements. The student will become acquainted with current theory and research in behavioral sciences. The course also allows the student to integrate theory with practical application through exercises and class projects dealing with problems in personnel selection, placement, training and evaluation. (Foundation courses)

Credit 4

BBUB-751 **Legal Environment of Business**
Registration #0102-751
An introduction to legal principles and their relationship to business practices including the background and sources of law, law enforcement agencies and procedures. Topical cases and examples are used as a guide to the observation of legal requirements and the legal forces which influence business and accounting decisions. (Foundation courses)

Credit 4

BBUB-758 **Seminar in Management**
Registration #0102-758
This course will take on different content depending on the instructor and quarter when offered. Topics which may be covered include management thought, systems theory and application, and behavioral aspects of management. Specific content for a particular quarter will be announced prior to the course offering. (Permission of director of Graduate Programs)

Credit 4

BBUB-759 **Integrated Business Analysis**
Registration #0102-759
A course intended to give experience in combining theory and practice gained in other course work. This integrative exposure is achieved by solving complex and interrelated business policy problems that cut across the several functional areas of marketing, production, finance and personnel. This course is aimed at the formulating and implementation of business policy as viewed by top management. The case method is used extensively. (All other core courses)

Credit 4

BBUB-770 **Business Research Methods**
Registration #0102-770
Research as a basis for policy building, planning, control and operation of the business enterprise. Concepts, tools, sources, methods, and applications are covered. Procurement and evaluation of data for business use from government and private sources. (Foundation courses)

Credit 4

BBUB-771, 772 **Research Option**
Registration #0102-771, -772
A thesis course requiring the student to confront a real business problem. Requirements include steps from design to completed management report. (Core courses and one of the following: BBUB-770, BBUA-718, BBUF-723, BBUQ-784)

Credit 8

BBUB-790 **Information Systems**
Registration #0102-790
The concepts and techniques for the design and implementation of a computer-based management information system are studied. Topics include systems theory, the generation and collection of data, the transformation and dissemination of information, and the economics of information. (BBUB-743)

Credit 4

Finance Group

BBUF-722 **Financial Management**
Registration #0104-722
A broad coverage of business finance with emphasis on the analytical techniques of resource allocation and asset management. Covers securities and securities markets, capital structure, analysis of financial statements, financing business operations, cost of capital and capital budgeting, (Foundation courses)

Credit 4

BBUF-723 **Theory of Finance and Research**
Registration #0104-723
This course involves a study of the current literature and most recent developments relating to the theories of investment and valuation, cost of capital, risk and dividend policy. Also considered are specific areas of application and the policy implications of the theories studied. (BBUF-722)

Credit 4

BBUF-724 **Problems In Financial Management**
Registration #0104-724
This course is designed to give the student greater depth in the basic concepts of financial management and greater facility in using the analytical techniques. Extensive use will be made of case material. Problem types to be considered include liquid asset management, capital budgeting, security valuation, methods of financing and dividend policy. (BBUF-722)

Credit 4

BBUF-72S **Securities and Investment Analysis**
Registration #0104-725
Study of securities and various investment media and their markets. Analysis of investment values based on financial and other data. Considers factors such as return, growth, and risk. (BBUF-722)

Credit 4

BBUF-729 **Seminar in Finance**
Registration #0104-729
This course will take on different content depending on the instructor and quarter when offered. Topics which may be covered are: financial models, financial analysis techniques, financial institutions and capital markets. Specific content for a particular quarter will be announced prior to course offering. (Permission of director)

Credit 4

BBUF-745 **Economic Environment**
Registration #0104-745 **of American Business**
Nature of the business firm; theory of demand, costs and prices; competition and monopoly; production function and the marginal productivity theory of distribution; saving and investment, the determination of the level of income; Federal Reserve operations; fiscal and monetary policies.

Credit 4

BBUF-757 **Seminar in Economics**
Registration #0104-757
Content will differ depending on the quarter and instructor. Topics which may be covered include international finance, monetary theory, labor economics and market structure. (Permission of director)

Credit 4

BBUF-765 **Business Economics and**
Registration #0104-765 **Applied Econometrics**
The course stresses model building, with emphasis on the economic foundations of the models. Econometric techniques are employed in the development and testing of aggregate, industry, and company models, with attention given to the feedback relationship from the aggregate (macro) model to the industry and company models. Forecasting and analysis of the industry and company models are employed. Simulation of the models under alternative policy assumptions is performed. Bank data, model-tools, and computer programs are supplied. (Foundation courses)

Credit 4

BBUF-767 **Advanced Microeconomic Theory**
Registration #0104-767
An advanced study of the fundamental economic principles underlying the nature of a business firm. Topics include: theories of demand and revenue; theory of costs and production analysis in both the short-run and the long-run; equilibrium of demand and supply and efficiency of competition; market structures and their characteristics; pricing and output under perfect competition, pure monopoly, imperfect competition, and oligopoly; resource allocation and product distribution. Business applications are given along with the exposition of the theory. (Foundation courses)

Credit 4

BBUF-768 **Advanced Macroeconomic Theory**
Registration #0104-768
An advanced study of the fluctuations and growth of economic activity in a modern complex society. Topics include: measuring macroeconomic activity; modeling economic activity; microeconomic foundations of macroeconomic theory (the labor, the commodity, the money, and the bond markets); a parallel discussion of the complete Classical and Keynesian macroeconomic models; recent criticism of the two models; the general equilibrium; the phenomena of inflation and unemployment and the way business can forecast them; the impact of fiscal and monetary policies in promoting and maintaining economic stability and growth; reality and macroeconomic disequilibrium; and wage-price policies. (Foundation courses)

Credit 4

Marketing group

BBUM-761 **Marketing Concepts**
Registration #0105-761
Critical examination of the marketing system as a whole; functional relationships performed by various institutions such as manufacturers, brokers, wholesalers, and retailers. Analysis of costs, strategies and techniques related to the marketing system. Both behavioral and quantitative aspects of marketing are considered. (Foundation courses)

Credit **4**

BBUM-762 **Advanced Marketing Management**
Registration #0105-762
An in-depth study of selected problems which face marketing managers concerned with promotion, place, price, and product. Material centers on staff marketing functions. Research topics unique to the field of marketing are covered. (BBUM-761)

Credit 4

BBUM-763 **Seminar in Consumer Behavior**
Registration #0105-763
A study of the market in terms of the psychological and socio-economic determinants of the buyer's behavior, including current trends in purchasing power and population movements. (BBUM-761)

Credit **4**

BBUM-764 **Marketing Logistics**
Registration #0105-764
The study of an integrated system for the distribution of products from producer to consumer. The emphasis is on the physical flow of goods both between and within marketing institutions. Specific topics covered are unit geographic location, internal product flow, inter-unit transportation, and warehousing. (BBUM-761)

Credit 4

BBUM-766 **International Marketing**
Registration #0105-766
A study of the differences in market arrangements as well as in the legal, cultural, and economic factors found in foreign countries. Topics included are planning and organizing for international marketing operations: forecasting and analysis; inter-relationships with other functions; and product, pricing, promotion, and channel strategy. (BBUM-761)

Credit 4

BBUM-769 **Seminar in Marketing**
Registration #0105-769
This course will take on different content depending on the instructor and quarter when offered. Topics which may be covered are: marketing models, marketing channels, articulation with top marketing executives, and marketing positioning. Specific content for a particular quarter will be announced prior to course offering. (Permission of director of graduate programs)

Credit 4

Quantitative group

BBUQ-778 **Probability Theory**
Registration #0106-778
A calculus-based introduction to probability theory. The course includes set theory, theorems, axioms, and concepts of probability, discontinuous and continuous distributions, moment generating functions and probability generating functions. (Differential and Integral Calculus and Foundation courses)

Credit 4

BBUO-781 **Statistical Analysis I**
Registration #0106-781
A study of probability and classical statistics including set theory, discrete and continuous probability distributions, sampling distributions, point estimation, and hypothesis testing. Applications are made to the managerial decision making situation.

Credit 4

BBUQ-782 Statistical Analysis II
Registration #0106-782
A continuation of topics from classical statistics including interval estimation, nonparametric tests, analysis of variance, regression and correlation analysis, time series, and index numbers. (BBUQ-781)

Credit 4

BBUQ-783 Bayesian Decision Analysis
Registration #0106-783
An introduction to decision theory for managerial decision situations with a strong emphasis on Bayesian decision analysis. Topics include modeling, principles of choice, the expected opportunity loss, the expected value of information, revision of discrete and continuous prior distributions, the expected value of sample information, optimal sampling, utility functions, and decision diagramming. (BBUQ-782) Not open to decision science majors)

Credit 4

BBUQ-784 Decision Theory
Registration #0106-784
The decision theory approach to decisions under uncertainty is examined. The modeling of business decision situations, the utilization of utility theory, and the application of various principles of choice are considered. The Bayesian approach to decision theory is primarily emphasized. (BBUQ-778)

Credit 4

BBUQ-786 Operations Research—
Registration #0106-786 Mathematical Programming
An introduction to the application of operations research techniques to business decision making. Specific topics covered are linear programming, algebraic and geometric concepts, simplex method, sensitivity testing and duality, optimization, dynamic programming and integer programming. (BBUB-743)

Credit 4

BBUQ-787 Operations Research—
Registration #0106-787 Probabilistic Models
An introduction to the use of probability in operations research models. Probabilistic techniques are applied to the problems of forecasting, capital budgeting, PERT, inventory, queueing and Markov processes. (BBUB-778)

Credit 4

BBUQ-789. Simulation
Registration #0106-789
An introduction to the various uses of simulation as a management tool for decision making. Models of varying levels of sophistication employing simulation programming languages are constructed. (Foundation courses)

Credit 4

BBUQ-792 Concepts in Computer Utilization
Registration #0106-792
An introduction to the use of computers in problem solving. Students are exposed to BASIC programming language. Computer systems and their use in business are examined.

Credit 4

BBUQ-79S Seminar in Decision Sciences
Registration #0106-795
This course will take on different content depending on the instructor and quarter when offered. Topics which may be covered are: multi-variate analysis, simulation, operations research, linear programming and Bayesian techniques. Specific content for a particular quarter will be announced prior to course offering. (Permission of director of Graduate programs)

Credit 4

College of Continuing Education

Graduate Courses in Applied and Mathematical Statistics

CTAM-711 Fundamentals of Statistics I
Registration #0240-711
For those taking statistics for the first time. Covers the statistical methods used most in industry, business and research. Essential to all scientists, engineers, and administrators.
Topics: organizing observed data for analysis and insight; learning to understand probability as the science of the uncertain; concepts of practical use of the Central Limit Theorem. (Consent of the department.)

Credit 3

CTAM-712 Fundamentals of Statistics II
Registration #0240-712
Continuation of CTAM-711
Topics: concepts and strategies of statistical inference for making decisions about a population on the basis of sample evidence; tests for independence and for adequacy of a proposed probability model; learning how to separate total variability of a system into identifiable components through analysis of variance; regression and correlation models for studying the relationship of a response variable to one or more predictor variables. (All standard statistical tests) (CTAM-711 or equivalent.)

Credit 3

CTAM-721 Quality Control: Control Charts
Registration #0240-721
A practical course designed to give depth to practicing quality control personnel.

Topics: statistical measures; theory, construction, and application of control charts for variables and for attributes; computerization procedures for control charts; tolerances, specifications, and process capability studies; basic concepts of total quality control, and management of the quality control function. (Consent of the department.)

Credit 3

CTAM-731 Quality Control: Acceptance Sampling
Registration #0240-731
Investigation of modern acceptance sampling techniques with emphasis on industrial application.
Topics: single, double,' multiple, and sequential techniques for attributes sampling; variables sampling; techniques for sampling continuous production. The course highlights Dodge-Romig plans, Military Standard plans, and recent contributions from the literature. (Consent of the department.)

Credit 3

CTAM-741 Techniques for Investigational Analysis
Registration #0240-741
Studies of special statistical techniques applicable to industrial, educational, accounting, medical, and business-type problems. Helpful to those doing research in these fields.
Topics: use of special probability papers, probit analysis, sensitivity testing, order statistics and extreme value applications, analysis of means, goodness of fit tests, and special plotting techniques. (CTAM-712 or equivalent.)

Credit 3

CTAM-751 Introduction to Decision Processes
Registration #0240-751
A first course in statistical decision theory featuring concrete situations and realistic problems.
Topics: basic statistical ideas; how to make the best decision prior to sampling, after sampling, sequentially; optimum managerial strategies, practical applications. (Consent of the department.)

Credit 3

CTAM-761 Reliability
Registration #0240-761
A methods course in reliability practices: What a reliability engineer must know about reliability prediction, estimation, analysis, demonstration, and other reliability activities. Covers most methods presently being used in industry.
Topics: applications of normal, binomial, exponential, and Weibull graphs to reliability problems; hazard plotting; reliability confidence limits and risks; strength and stress models; reliability safety margins; truncated and censored life tests; sequential test plans; Bayesian test programs. (CTAM-712 or equivalent.)

Credit 3

CTAM-801 Design of Experiments I
Registration #0240-801
How you design and analyze experiments in any subject matter area; what you do and why.
Topics: basic statistical concepts, scientific experimentation, completely randomized design, randomized complete block design, nested and split plot designs. Practical applications to civil engineering, pharmacy, aircraft, agronomy, photoscience, genetics, psychology, and advertising. (CTAM-712 or equivalent.)

Credit 3

CTAM-802 Design of Experiments II
Registration #0240-802
Continuation of CTAM-801
Topics: factorial experiments: fractional, three level, mixed; response surface exploration. Practical applications to: medical areas, alloys, highway engineering, plastics, metallurgy, animal nutrition, sociology, industrial and electrical engineering. (CTAM-801.)

Credit 3

CTAM-811 Probability Theory and Applications I
Registration #0240-811
How to handle processes that have some chance element in their structure.
Topics: review of basic concepts of mathematical theory; Markov sequences; Poisson processes, and discrete parameter random processes; applications. (CTAM-822 or equivalent.)

Credit 3

CTAM-812 Probability Theory and Applications II
Registration #0240-812
Continuation of CTAM-811, with more on stochastic processes.
Topics: algebraic methods useful for solving Markov chains, nonfinite and continuous Markov chains, limiting distributions, and an introduction to queuing theory. (CTAM-811 or equivalent.)

Credit 3

CTAM-821 Theory of Statistics I
Registration #0240-821
Provides a sound theoretical basis for continuing study and reading in statistics.
Topics: constructs and applications of mathematical probability; discrete and continuous distribution functions for a single variable and for the multivariate case; expected value and moment generating functions; special continuous distributions. (Consent of the department.)

Credit 3

CTAM-822 Theory of Statistics II
Registration #0240-822
Continuation of CTAM-821.
Supporting theory for, and derivation of, sampling distribution models; applications and related material. (CTAM-821 or equivalent.)

Credit 3

CT AM-823 Theory of Statistics III
Registration #0240-823
Continuation of CTAM-821, -822
Point estimation theory and applications; the multivariate normal probability model, its properties and applications; interval estimation theory and applications. (CTAM-822 or equivalent.)

Credit 3

CTAM-830 Multivariate Analysis
Registration #0240-830
Deals with the summarization, representation, and interpretation of data sampled from populations where more than one characteristic is measured on each sample element. Usually the several measurements made on each individual experimental item are correlated, so univariate analysis should not be applied to each measurement separately. This course covers the use of the basic multivariate techniques. Computer problem solving will be emphasized. Topics will include multivariate t-test, ANOVA, regression analysis, repeated measures, quality control and profile analysis. (CTAM-801, 802.)

Credit 3

CTAM-841 Regression Analysis I
Registration #0240-841
A methods course dealing with the general relationship problem.
Topics: the matrix approach to simple and multiple linear regression; analysis of residuals; dummy variables; orthogonal models; computational techniques. (CTAM-802 or equivalent.)

Credit 3

CTAM-842 Regression Analysis II
Registration #0240-842
A continuation of CTAM-841.
Topics: selection of best linear models; regression applied to analysis of variance problems; nonlinear estimation and model building. (CTAM-841 or equivalent.)

Credit 3

CTAM-851 Nonparametric Statistics
Registration #0240-851
Distribution-free testing and estimation techniques with emphasis on applications.
Topics: sign tests; Kolmogorov-Smirnov statistics; run tests; Wilcoxon-Mann-Whitney test; Chi-Square tests; rank correlation; rank order tests; quick tests. (CTAM-712 or equivalent.)

Credit 3

CTAM-853 Managerial Decision Making
Registration #0240-853
Continuation of CTAM-751, statistical decision analysis for management.
Topics: utilities; how to make the best decision (but not necessarily the right one); normal and beta Bayesian theory; many action problems; optimal sample size; decision diagrams. Applications to marketing; oil drilling; portfolio selection; quality control; production; and research programs. (CTAM-751 or equivalent.)

Credit 3

CTAM-861, 862 Reliability Certification
Registration #0240-861, -862 Seminars I & II
The American Society for Quality Control (ASQC) offers Certification as a Reliability Engineer by written examination. These two-quarter courses prepare students for this examination. Purpose is to increase reliability expertise. Offered are lectures, handouts, workshops, and practice examinations.
Topics: reliability management, prediction, estimation, analysis, apportionment, test and demonstration, math models growth; maintainability, parts selection, design review, human factors; and other selected reliability activities. (Consent of the department.)

Credit 3/Qtr.

CTAM-871 Sampling Theory and Application
Registration #0240-871
An introduction to sample surveys in many fields of applications with emphasis on practical aspects.
Topics: review of basic concepts, sampling problem elements; sampling; random, stratified, ratio, cluster, systematic, two-stage cluster; wild life populations, questionnaires, sample sizes. (CTAM-712 or equivalent.)

Credit 3

CTAM-881 **Bayesian Statistics I**
Registration #0240-881
Probability as a degree of belief; how we learn; the applications of Bayesian principles to: estimation of failure rates, revising odds, testing precise hypotheses, finding credible regions; entopy and information; description of errors in measurements; analysis of experimental results. (CTAM-712 or equivalent.)

Credit 3

CTAM-882 **Bayesian Statistics II**
Registration #0240-882
Continuation of CT AM-881: non-normal and contaminated distributions; decision making; discrimination; tests of significance and goodness of fit from the Bayesian point of view; sequential decisions; handling several variables: comparisons, measuring efficiency, straightline analysis. A potpourri of applications: rare events, reliability, radar, and other. (CTAM-881.)

Credit 3

CTAM-886 **Sample Size Determination**
Registration #0240-886
The question most often asked of an industrial statistician is “What size sample should I take?" This course answers that question for a wide variety of practical investigational projects. Techniques for the full use of the optimal sample evidence are also offered.

Prerequisite: 0240-712 or equivalent.

Credit 3

CTAM-891, 892, 893 **Special Topics In Applied Statistics**
Registration #0240-891, -892, -893
This course provides for the presentation of subject matter of important specialized value in the field of applied and mathematical statistics not offered as a regular part of the statistics program. (Consent of the department.)

Credit 3/Qtr.

CTAM-895 **Statistics Seminar**
Registration #0240-895
This course or sequence of courses, provides for one or more quarters of independent study and research activity by students other than those in the Plan C option. This course may be used by other departments at RIT (or other colleges) to provide special training in statistics for students who desire an independent study program in partial fulfillment of graduate degree requirements. (Consent of all departments involved.)

Credit 3

CTAM-896, 897, 898 **Thesis**
Registration #0240-896, -897, -898
For students working toward the MS degree in mathematical statistics under Plan A. (Consent of the department.)

Credit 3/Qtr.

CTAM-899 **Individual Achievement Program**
Registration #0240-899
For students accepted under the Plan C Option (Independent Study). The program to be followed will permit either:

(a) satisfactory achievement in the same subject matter the student would select under Plan A or Plan B; or

(b) satisfactory achievement through independent studies in the student's particular field of professional interest in statistics, such as mathematics, engineering, quality control, or business.

Prerequisite: Consent of the department.

Credit 3-45 quarter hours to be earned and recorded in quarter hour segments as the candidate progresses in the plan of independent study set up with him or her.

College of Engineering

Engineering

EENG-201 **Introduction to Engineering I**
Registration #0302-201
This course is offered in three distinct versions—one relating to electrical engineering, a second to industrial engineering, and a third to mechanical engineering. One objective of the course is to introduce the student to the engineering profession and to the specific disciplines within engineering. A second objective, through lecture and laboratory sessions, is to provide the student with basic skills in engineering graphical communications. Students will normally choose that version of the course relating to their departmental selection. However, students satisfy the course requirement by taking any version of the course independent of their departmental choice.

Credit 4

EENG-202 **Introduction to Engineering II**
Registration #0302-202
This course is offered in two distinct versions. The intent is to give the student greater in-depth understanding of one of the two engineering fields—electrical and industrial—than was possible in the first course. Course format varies among the two versions.

Credit 4

Electrical Engineering

EEEE-351, 352, 353 **Circuit Analysis I, II, III**
Registration #0301-351, -352, -353
Basic circuit laws, network theorems, RLC circuits and their responses. Sinusoidal analysis, complex notation, phasors and power. The concept of complex frequency. Special topics including magnetically coupled circuits, two-port networks, network topology, and Fourier analysis (SMAM-253, SPSG-207 and concurrent with SMAM-305, 306)

Class 3, Lab 3, Credit **4**

EEEE-430 **Linear Systems**
Registration #0301-430
An introductory course in linear systems stressing applications of the Fourier and LaPlace transforms, input-output characteristics of linear networks will be emphasized through the treatment of transfer functions and convolution integrals. The interdependence between time and frequency response will be treated extensively. The notions of system realizability and stability will be considered. (EEEE-353 concurrently)

Class 4, Credit 4

EEEE-441, 442 **Electronics I, II**
Registration #0301-441, -442
Solid-state electronic devices, their external characteristics and models. Analysis of electronic circuits for rectification, amplification, instrumentation and control. Introduction to electronic circuit design (EEEE-352 concurrently)

Class 3, Lab, 3, Credit 4

EEEE-461, 462 **Electrical Engineering I, II**
Registration #0301-461, -462
A course for non-electrical engineering majors. Circuit analysis, electronics, machines, switching circuits, logic and the elements of communication. (SPSG-207, SMAM-306)

Class 3, Lab, 3, Credit 4

EEEE-471, 472 Electromagnetic Fields I, II
Registration #0301-471, -472
Vector analysis, electrostatics and dielectrics, conduction current fields, magnetics, time varying fields, Maxwell's equation and wave equations. Concepts of retarded potentials. (SMAM-308)

Class 4, Credit 4 — EEEE-471
Class, Lab. 3, Credit 4 — EEEE-472

EEEE-531 Electromechanical Energy Conversion
Registration #0301-531
A development of the basic relationships of field energy, magnetic force, torque and generated voltage in an electromechanical device and expansion of these fundamentals into an understanding of the operational characteristics of the electrical machine. (EEEE-353)

Class, Lab. 3, Credit 4

EEEE-613 Introduction to Automatic Controls
Registration #0301-613
A one-quarter study of linear control systems and their physical behavior including stability and transient response. This is approached through the classical methods of the LaPlace domain; Routh's Criterion, Nyquist, Bode and Nichols charts and root locus. Lead and lag compensators are introduced using these tools. Analog computation techniques are studied and used, in laboratory, as a means of verifying the analysis and design of complex systems. (EEEE-430, SMAM-420)

Class 3, Lab. 3, Credit 4

EEEE-634 Introduction to Communications
Registration #0301-634
Modulation theory, including both amplitude and frequency modulation and demodulation systems; pulse modulation systems, including pulse amplitude modulation, pulse width modulation and pulse position modulation; introduction to random signals and noise, with emphasis on the determination of system performance. (SMAM-351, EEEE-430)

Class 4, Credit 4

EEEE-643 Electronics III
Registration #0301-643
Linear waveshaping; digital circuits including the multivibrator family, gates, non-linear waveshaping; introduction to switching theory: Boolean algebra, logic circuits, K-maps, counters, converters, sampling circuits. (EEEE-441)

Class 3, Lab. 3, Credit 4

Technical Electives

EEEE-S32 Electrical Machines I
Registration #0301-532
The design and operating characteristics, both static and dynamic, of transformers and synchronous and induction machines. (EEEE-353, 471)

Class 3, Lab. 3, Credit 4

EEEE-535 Introduction to Power Electronics
Registration #0301-535
This course provides an introduction to the theory of thyristor circuits with emphasis on applications. The course builds upon the theory of static switching, SCR characteristics, triggering and commutation. This leads the way to the study of controlled and uncontrolled rectification and inversion, AC and DC line control and frequency conversion using thyristors. The laboratory is an integral part of the course where the experiments complement the classroom lectures by providing exposure to the device characteristics, testing and measuring techniques and various thyristor systems. (EEEE-441, EEEE-531 or concurrent registration for EEEE-531)

Class 3, Lab. 3, Credit 4

EEEE-536 Motor Application and Control
Registration #0301-536
A review of the speed torque characteristics of DC and AC motors. A study of the characteristics of mechanical loads and the transient response of electromechanical systems. A review of thyristor charcteristics and the design of solid state motor control systems. (EEEE-430, 531, 645)

Class 3, Lab. 3, Credit 4

EEEE-590 Thesis
Registration #0301-590
A research or development project will be carried out under the general supervision of a staff member. The project need not be of the "state of the art" type. A reasonable problem of theoretical and/or experimental investigation will be acceptable as a thesis topic.

Credit 4

EEEE-614 Control Synthesis
Registration #0301-614
This course builds upon the classical analysis techniques introduced in EEEE-613. Practical experimental and mathematical approaches to obtaining transfer functions are developed. Resulting systems are modeled both analytically in the LaPlace domain and experimentally on the analog computer. System improvements by tachometer feedback, lead compensation, lag compensation and by by lead-lag compensation are developed using Nyquist, Bode and Nichols chart methods and by root locus. Results are verified experimentally. Figures of merit are discussed and applied. (EEEE-613)

Class 3, Lab. 1, Credit 4

EEEE-621 Transmission Propagation and Waves
Registration #0301-621
A course in guided and unguided wave propagation; transmission lines, wave guides, antennas; antenna arrays, radio-frequency and optical interference and diffraction; aperture effects and beamforming. (EEEE-472)

Class 3, Lab. 3, Credit 4

EEEE-645 Special Semiconductors
Registration #0301-645
The study of a variety of semiconductors generally used for purposes other than signal processing. Included are thyristors and their control devices, various optoelectronic elements, voltage regulator ICs and special MOS devices. Applications are stressed and a comprehensive design exercise is included. (EEEE-643)

Class 3, Lab. 3, Credit 4

EEEE-650 Introduction to Logic and Switching
Registration #0301-650
Boolean algebra; analysis and synthesis of combinatorial switching circuits; analysis and synthesis of sequential switching circuits; hazards in switching circuits for digital computers. (EEEE-643)

Class 4, Credit 4

EEEE-660 Interfacing Electronics and Logic
Registration #0301-660
Topics include: brief review of translators between ECL, TTL, MOS, 1L and CMOS logic families. Detailed presentation of digitally controlled analog switches, multiplexors and sample/hold circuits. Line driver and receiver applications including impedance matching, relection suppression, interfaces for teletype, audio tape recorder, telephone and acoustic coupler, and EIA-RS-232C. Presentation of some important microprocessor oriented interface chips: PIA (6820), UARTs, and MODEMS. Topics in sequential logic including a brief review of counters and conventional logic, then considerations of unclocked logic and race conditions, hang-up states, initializing logic, programmed logic and state space concepts. Microprocessor controllers and sequencers will be discussed as time permits. Individual student projects required.

Class 4, Credit 4

EEEE-665 Digital Computer Workshop
Registration #0301-665
This course will stress the working structure, programming details, and interfacing characteristics of minicomputers in sufficient detail to enable one to use them in a varied set of engineering applications. (ICSP-205 or ICSP-220)

Class 3, Lab. 3, Credit 4

EEEE-666 Introduction to Microcomputers
Registration #0301-666
This course will discuss currently available microcomputer systems and will include such topics as programming methods, architecture, areas of application and a relative comparison of existing systems. The course will consist of lecture, seminar and some student projects. Enrollment will be limited to 15 and preference will be given to fifth-year students with the required prerequisites. (EEEE-643, EEEE-665)

Credit 4

EEEE-670 Introduction to Microelectronics
Registration #0301-670
Hybrid and monolithic microelectronic technology; processes in thick film and thin film circuit fabrication; complementary nature of monolithic and film circuits; impact of fabrication, testing and quality control on microcircuit design. (EEEE-643)

Class 4, Credit 4

EEEE-671 Hybrid Microelectronic Design
Registration #0301-671
An electronic design course utilizing the medium of thick film hybrid technology. Functional electronic modules will be designed, produced and tested, from original specifications to finished package, with students performing all steps. (EEEE-670)

Class 3, Lab 3, Credit 4

EEEE-672 Optical Devices and Systems
Registration #0301-672
An introductory applied optics course designed not only to familiarize and review optical fundamentals but to introduce state of the art concepts and applications. Fundamental aspects of laser operation, lens system analysis, optical modulation, optical detection, and noise problems associated with optical components will be discussed. Applications to fiber optic, integrated optic, and solar optic systems will be considered. A demonstration lab complements course activities. (SPSP-314, 315; EEEE-471, 472—concurrent)

Class 3, Lab. 3, Credit 4

EEEE-673 Applied Electronic Design
Registration #0301-673
A project-type lab-oriented course wherein the student will design, build, and test electronic circuits, system parts, or systems to specifications. The course is a modest attempt to simulate the industrial setting to better prepare the student to handle practical electronic design work by providing a supervised first attempt experience. (EEEE-643)

Class 3, Lab. 3, Credit 4

EEEE-675 Analog/Hybrid Computation
Registration #0301-675
An introduction to the concepts of digital logic as applied to analog simulation and computation. This will include the basic concepts of iterative analog computation, hybrid computation, interface hardware and software, and hybrid computer applications. Instruction and practice will be provided in the techniques of programming and operating the DES-30/TR48 analog/hybrid computer. (EEEE-613)

Class 4, Credit 4

EEEE-679 Active and Passive Filters
Registration #0301-679
The first half of this course deals with the filter transfer functions, poles and zeros and the concepts of filter amplitude and phase response. Butterworth, Chebyshev and elliptic filters are considered as well as low-pass/high-pass and low-pass/band-pass transformations. The second half of the course deals with methods of practical filter design with emphasis placed on active, operational amplifier filters. (EEEE-430)

Class 4, Credit 4

EEEE-687 Power System Analysis
Registration #0301-687
An introductory course dealing with basic power network concepts; matrix transformations and the use of the digital computer to solve them; parameters of power system equipment; the symmetrical component approach for handling balanced and unbalanced faults; load flow studies and the numerical techniques for solving them; and an introduction to system stability. (EEEE-531)

Class 4, Credit 4

EEEE-693 Digital Data Communications
Registration #0301-693
A course on the principles and practice of modern data communications systems. Topics covered include pulse amplitude modulation, frequency shift keying, phase-shift keying, pulse code modulation, digital error control, and frequency and switching. (EEEE-

Class 4, Credit 4

EEEE-695 Introduction to Audio Engineering
Registration #0301-695
A course based on topics from dynamics, acoustics and audio systems. Electrical-mechanical equivalents. Plane and spherical acoustic waves. Radiators and resonators. Loudspeaker systems. Equalization methods in recording and playback. Elements of speech and hearing. (EEEE-430, SMAM-308)

Class 4, Credit 4

EEEE-696 Communication Circuit Design
Registration #0301-696
Design and operation of electronic circuits used in communication systems. Oscillators, amplifiers, modulators, matching networks, demodulators, transmitting and receiving systems. A project type laboratory is included (EEEE-442)

Class 3, Lab. 3, Credit 4

Graduate Courses in Electrical Engineering

The courses listed below are normally open only to students who have been formally admitted into the graduate electrical engineering programs. Students with a baccalaureate degree in engineering or science may be permitted to enroll in any of these courses as non-matriculated students if they have already completed the stated prerequisites for a particular course. Undergraduate students may be permitted to take some of these courses as undergraduate technical electives provided they are fourth or fifth year students and have already completed the prerequisites. The permission of the director of Graduate Programs is required for enrolling in these courses except in the case of matriculated graduate students.

Whenever a prerequisite is stated in the form of a specific course number, the words “or equivalent" are always implied. Prerequisites, if any, are shown in parentheses following the description of the course.

EEEE-700, 701 Linear Systems I, II
Registration #0301-700, -701
These two courses are required of all graduate students in Electrical Engineering (Except those who were admitted before September 1977). Topics in the first course (700) include differential equations, linear algebra, linearity and superposition convolution, Fourier series and Fourier Transforms. Topics in the second course (701) include LaPlace Transforms, complex variables, Inverse LaPlace transformation, transfer functions of networks, state variables, Z transform and difference equations. Many of above topics might be familiar to the graduate student because they are covered in undergraduate EE courses in some form or other. However, these topics will be covered in these two courses in greater depth and the student will be expected to develop a higher level of understanding.

Credits 4/Quarter

EEEE-702 Introduction to Random Variables and Signals
Registration #0301-702
Random events, random variables, histograms; probability density functions; functions of a random variable, moments; multivariate topics; statistical decision theory; parameter estimation. This course is a prerequisite for the sequence 735, 736, 737.

Credit 4

EEEE-704 Electromagnetic Fields
Registration #0301-704
Vector analysis; electrostatic fields in vacuum and in dielectrics; energy and forces; analytical methods of solution of electrostatic problems; approximate methods; magnetic field of steady currents; magnetic materials; electromagnetic induction; Maxwell’s equations. (EEEE-471, 472)

Credit 4

EEEE-705 Electromagnetic Waves
Registration #0301-705
Maxwell’s equations; propagation of plane waves in unbounded regions; reflection and refraction of waves; total reflection, polarizing angle, multiple dielectric boundaries; guided electromagnetic waves; characteristics of common waveguides; circular waveguides; resonant cavities; radiation and antennas. (EEEE-471, 472)

Credit 4

EEEE-706 Special Topics in Electromagnetics
Registration #030-706
Selection of one or more of the following topics depending upon the interest of the students: interaction of fields and matter; wave propagation in anisotropic media; theory of antenna arrays; microwave networks; field computation by method of moments; generation of microwaves. (EEEE-704, 705)

Credit 4

EEEE-708 Passive and Active Filter Design
Registration #0301-708
Network analysis (review); classical frequency domain filters and passive filter design; filter transformations: low pass to high pass and bandpass; active filter design using single Op amps and RC networks; filter design using multiple Op amps for two-pole two-zero sections; realization of n-pole filters using two-pole sections; sensitivity analysis; tuning of filters; effect of non-ideal Op amp characteristics on filter performance; design examples and demonstrations. (EEEE-700, 701)

Credit 4

EEEE-709 Active Network Synthesis
Registration #0301-709
Fundamentals of network synthesis: energy functions, P.R. functions; properties of network functions; synthesis of RC one-port and two-port networks; approximation, normalization and frequency scaling; active network analysis; active network elements; tunnel diodes, gyrators, impedance converter, impedance inverter; realizability, stability and sensitivity of active networks; synthesis of one-port and two-port active networks using negative resistances, synthesis of one-port and two-port active networks using controlled sources. (EEEE-700, 701)

Credit 4

EEEE-711 Integrated Circuit Operational Amplifiers
Registration #0301-711
Analysis of operational amplifier circuits using the ideal op amp; development of circuit models to predict non-ideal op amp characteristics; study of feedback systems, stability (using Bode plots), and compensation; direct-coupled amplifiers and operational amplifier design; interpretation of manufacturers' specifications and basic applications with emphasis on practical aspects.

(EEEE-442, 700, 701)

Credit 4

EEEE-712 Control System Fundamentals
Registration #0301-712
This course is intended for graduate students who have not had a formal course in control systems in their undergraduate program. It is not open to those who have already had an introductory control systems course.

It is a study of linear control systems, their physical behavior, dynamical analysis and stability using mathematical models. This involves the use of root locus. Bode, and Nyquist techniques for the analysis of single and multiple-loop systems. (Elementary knowledge of LaPlace transforms)

Credit 4

EEEE-713 Modern Control Theory
Registration #0301-713
The development of the analytical techniques of modern theory as applied to linear control systems. Topics include vector spaces, state space, state variables, matrices and matrix functions, controllability, observability and stability theory. (EEEE-613 or EEEE-700 and either 613, or 712)

Credit 4

EEEE-714 Nonlinear
Registration #0301-714 Control Systems
An introduction to the physical nature and mathematical theory of nonlinear control systems' behavior using phase plane techniques, Liapounov theory, (including Aizerman's method, variable gradient methods and the Lure Forms), perturbation methods, describing function techniques and Popov's criterion; analysis of switching and relays. These are applied to both piecewise-linear and analytical nonlinear systems. (EEEE-713)

Credit 4

EEEE-716 Digital Signal Processing
Registration #0301-716
A course in sampled data methods aimed at the development and study Of discrete signal processing techniques. Elementary sampling theory and the one-sided Z transform are the principal tools used. Emphasis is placed on the design of digital filters and the use of fast Fourier transform methods. (EEEE-700, 701)

Credit 4

EEEE-718 Statistical Design of Control Systems
Registration #0301-718
Brief review of probability; statistical description of random processes; mean square error analysis; design of optimum linear control system for minimizing the mean square error with stationary random inputs with or without additive noise; design with constraints. (EEEE-613 or EEEE-712)

Credit 4

EEEE-719 Sampled Data Control Systems
Registration #0301-719
Brief review of the theory of sampling and quantizing; modified Z transform properties and application; design and compensation techniques for sampled data control systems; stability criteria; synthesis of digital controllers; multirate sampled data control systems; computer control theory. (EEEE-713, 701)

Credit 4

EEEE-720 Optimum Control Systems
Registration #0301-720
Introduction to calculus of variations; conditions of optimality; optimizing transient performance by statistical and variational procedures, dynamic programming and by Pontryagin's maximum principle; design of optimal linear systems with quadratic criteria. (EEEE-713)

Credit 4

EEEE-721 Thyristor Power Control and Conversion
Registration #0301-721
Thyristor family of semiconductors is becoming increasingly important in the area of power control and conversion. The objective of this course is to provide an adequate, application-oriented knowledge to those interested in the areas of control, power and power electronics. Topics to be discussed: preliminaries: basic principles of static switching, thyristor theory, triggering, commutations; rectifiers: principles of controlled rectification, analysis of single- and three-phase controlled rectifiers; inverters: series and parallel SCR inverters, design of inverters, sinewave filters, forced commutated inverter, McMurray inverter; DC systems: principles of DC—DC conversion, choppers, DC motor control, single-phase DC motor drives, three-phase DC motor drives, dual converter; cycloconverter: frequency conversion using SCR's phase-controlled cycloconverters, cycloconverter controls.

Modeling and simulation of thyristor circuits: thyristor models, approximations, digital simulation of choppers, inverters and cycloconverters, areas for further research.

Demonstration experiments will be set up. Also, individual projects by interested students will be encouraged.

Credit 4

EEEE-722 Control System Design
Registration #0301-722
Evaluation of feedback control system performance; design using root locus and frequency response plots; compensating networks; realization of transfer functions—cascade and feedback compensation; applications; analysis and design of AC feedback control systems; introduction to nonlinear system representation and design. (EEEE-613 or EEEE-712)

Credit 4

EEEE-734 Communication Techniques
Registration #0301-734
Study of different modulation schemes; linear modulation; angle modulation; Heuristic discussion of noise in linear modulation and FM systems; noise figure; brief discussion of pulse modulation. (EEEE-700)

Credit 4

EEEE-735 Digital Data Transmission
Registration #0301-735
Pulse code modulation and pulse amplitude modulation; carrier systems, FSK and PSK systems; DCPSK system; signal space representation of data signals and discussion of signal space. (EEEE-702, 734)

Credit 4

EEEE-736 Information Theory
Registration #0301-736
An introduction to the fundamental concepts of information theory: entropy, equivocation, transinformation and redundancy; coding for binary channels; measurement of signal parameters in the presence of noise; bandwidth vs. accuracy. (EEEE-702)

Credit 4

EEEE-737 Random Signals and Noise
Registration #0301-737
Random processes; correlation functions; spectrum of periodic functions and periodic random processes; orthogonal series for a random process; spectral densities; the Gaussian random process; noise through a linear system; physical sources of noise; noise figure; statistical decision theory. (EEEE-700, 702)

Credit 4

EEEE-738 Physics of Semiconductor Devices
Registration #0301-738
A basic course dealing with the physics of semiconductors. Topics include: crystal structure and bonding; election and hole motion; energy band structure; lattice vibrations; impurities; defects; occupation statistics; carrier transport; optical phenomena; and pn, npn, pnp junctions.

Credit 4

EEEE-739 Integrated Circuit Design
Registration #0301-739
A discussion of the practical as well as the physical aspects of integrated circuit design. Device layout and processing methods along with their effects on actual device characteristics will be considered in some detail. Passive components and active components such as the JFET, MOSFET and bi-polar devices will be discussed in conjunction with their implementation in linear as well as logic integrated circuits. (EEEE-738)

Credit 4

EEEE-740 Digital Integrated Circuits
Registration #0301-740
Evolution of digital IC's pertinent properties, overview of logic families. Techniques to: measure characteristics, model via computer, employ standard MSI/LSI, minimize package count, use programmed logic interface. Small system case studies; microcomputer, TV terminal, etc., (EEEE-650 or EEEE-750, 751. 751 may be taken concurrently).

Credit 4

EEEE-742 Computer Methods in Electrical
Registration #0301-742 Engineering
A study of numerical methods for the solution of problems in electrical engineering with special emphasis on approximation techniques. The method of moments and computer solutions of problems in antennas and microwave networks are studied. (SMAM-611)

Credit 4

EEEE-743 Minicomputer Fundamentals
Registration #0301-743
A course designed to provide engineers with a practical knowledge of minicomputers. Stress will be placed on basic architecture, software fundamentals, interfacing characteristics, and interrupt structures and control of I/O devices.

Credit 4

EEEE-744 Microprocessors
Registration #0301-744
This course aims to provide an understanding of basic microprocessor architecture, develop an understanding of micro-computer programming techniques and software aids, and illustrate methods of interfacing microcomputers to digital systems. Typical microprocessor applications which illustrate conventional logic replacement, hardware and software design trade-offs and design flexibility will be discussed. Most discussions will be based upon the Intel 8080 and the Motorola M6800. Lab exercises are an integral part of the course. (EEEE-743)

Credit 4

EEEE-750, 751, 752 Logic Design of Digital Systems I, II, III
Registration #0301-750, -751, -752
These three courses are devoted to the study of various aspects of logic and design and digital systems, both theoretical and practical. The first course (750) covers combinational logic. Topics include: Boolean algebra, classical approaches to the design of combinational logic networks, NAND and NOR networks, multiplexers, encoders and decoders, ROM's and their applications and arithmetic units. The second course (751) covers sequential circuits. Topics include: asynchronous fundamental mode and pulse mode sequential circuits, synchronous sequential circuits, counters, shift registers, shift registers with feedback and programmable counters. The third course (752) covers miscellaneous topics which deal with the extension of the concepts covered in the first two to more complex digital systems. Topics include some or all of the following: finite state models, arithmetic logic units, programmable logic arrays, logic design with microprocessors, fault detection.

Credit 4 per course

(The titles of these courses were formerly "Switching Circuits I, II, III).

EEEE-772, 773, 774 Special Topics in Electrical
Registration #0301-772, -773, -774 Engineering
Topics and subject areas that are not among the courses listed above are frequently offered under the title of Special Topics. Such courses are offered in the normal course format (regularly scheduled class sessions taught by an instructor). The number of credits may vary from course to course, but usually it is 4 credits per course.

Credit variable (maximum 4 per course number)

EEEE-780, Independent Study
Registration #0301-780,
This course number should be used by students wishing to study a topic on an independent study basis. The student must obtain the permission of the faculty member prior to registration.

Credit 4

EEEE-800, 801 Graduate Paper
Registration #0301-800, -801
This course number is used to fulfill the graduate paper requirement under the non-thesis option for the master of science degree In electrical engineering. The graduate paper is an extensive term paper on a topic of professional interest. The student must obtain the consent of a faculty member to supervise the paper before registering for these course numbers.

Credit 4 for EEEE-800; variable (maximum 4) for EEEE-801

EEEE-890 Research and Thesis Guidance
Registration #0301-890
An independent engineering project or research problem to demonstrate professional maturity, preferably involving the reduction of theory to practice. An oral examination and a written thesis are required.

Credit variable (maximum of 12 credits total)

EENG-790 Engineering Internship
Registration #0302-790
This course number is used by the students in the master of engineering degree program for earning internship credits. The actual number of credits is to be determined by the student's faculty advisor and subject to approval of the Graduate Committee of the College of Engineering.

Credit variable.

Industrial Engineering

EIEI-401 Introduction to Operations Research I
Registration #0303-401
An introduction to the methodology of problem solving. Investigation of mathematical programming techniques including linear programming, special types of linear programming problems and dynamic programming. (SMAM-308 or consent of instructor)

Class 4, Credit 4

EIEI-402 Introduction to Operations Research II
Registration #0303-402
A survey of elementary mathematical models within the field of systems and industrial engineering. Areas of study include queuing theory, network analysis, replacement theory, and inventory theory. (EIEI-401 or consent of instructor)

Class 4, Credit 4

EIEI-415,416 Human Factors I, II
Registration #0303-415, -416
A survey of human factors from 1) physiological constraints of the human; 2) behavorial/psychological characteristics of the human; and 3) the psychomotor skills ability of the human. Emphasis is placed on practical applications of each area.

Class 3, Lab. 2, Credit 4

EIEI-420 Work Measurement and Analysis I
Registration #0303-420
Methods of measuring and analyzing work, human capabilities, micromotion, memomotion study, process and operation analysis. Emphasis placed on methods of operation analysis as applied to the design and evaluation of simple man-machine systems.

Class 3, Lab. 2, Credit 4

EIEI-422 Systems and Facilities Planning
Registration #0303-422
Review of firm economics and market relationships, mass production economies, the plant location problem. The plant location problem: factors influencing layout (products, equipment, manpower, movement of materials, service factors), materials handling systems and factors influencing its design, methods of layout evaluation.

Class 3, Lab. 2, Credit 4

EIEI-450 Applied Human Factors
Registration #0303-450 Design of Experiments
An applied approach to the problem of how one goes about running a study or experiment in human factors.

Class 4, Credit 4

EIEI-481 Management Theory and Practice
Registration #0303-481
Development of the fundamental principles of the industrial enterprise. Internal organization as well as general economic conditions are considered. Emphasis is placed on the role of behavioral science.

Class 4, Credit 4

EIEI-482, 483 Production Control I, II
Registration #0303-482, -483
Fundamental principles of the control of industrial production. The relation of market demands, profits, facilities, economic flow of processes, utilization of machines, labor, costs.

Class 4, Credit 4

EIEI-503 Simulation
Registration #0303-503
A first course in simulation emphasizing the role of the computer in developing simulation models. The GASP IV simulation language is emphasized.

Class 4, Credit 4

EIEI-504 Introduction to Operations Research III
Registration #0303-504
A course intended to provide an integrated view of advanced programming techniques and their applications to industrial problems.

Class 4, Credit 4

EIEI-510, 511 Applied Statistical Analysis
Registration #0303-510, -511 for Engineers I, II
An applied approach to statistics utilizing theoretical tools acquired in other math-stat courses. Heavy emphasis on understanding and applying statistical analysis methods in real-world situations engineering. Topics include quality control, analysis or variance, and regression.

Class 4, Credit 4

EIEI-512 Reliability
Registration #0303-512
Concept of reliability, basic failure laws, reliability measurement, structural analysis of reliability; repair problems, surveillance problems, maintenance problem.

Class 4, Credit 4

EIEI-520 Engineering Economy
Registration #0303-520
Time value of money, methods of comparing alternatives, depreciation and depletion, income tax consideration, replacement, retirement and obsolescence, and capital budgeting.

Class 4, Credit 4

EIEI-530 Engineering Design
Registration #0303-530
A case study approach of ten real world experiences in engineering design.

Class 4, Credit 4

EIEI-540 Introduction to Operations Research IV
Registration #0303-540
An introduction to some more advanced topics in operations research and industrial engineering. Areas of study include game theory, Markov chains and their applications, network analysis, including PERT.

Class 4, Credit 4

EIEI-545 Techniques of Systems Engineering
Registration #0303-545
LaPlace, Fourier and Z transforms; transform methods for solving differential, difference and differential-difference equations; feedback networks; flow graphs.

Class 4, Credit 4

EIEi-550 Safety Engineering
Registration #0303-550
To acquaint students with practical aspects of safety engineering. Students will acquire a working knowledge of legal and technical aspects of safety. Recent developments in this area will be stressed, such as OSHA, Consumer Product Safety Commission, and the Federal Highway Safety Act. Students will also be exposed to research methodology and ways of evaluating safety programs and related research. Reference sources will be outlined.

Class 4, Credit 4

EIEI-560 Project Design
Registration #0303-560
A design course oriented to the solution of on-site industrial engineering problems. Each student group will attempt to define, analyze, design, and implement a solution to actual ongoing problems in the Rochester community.

Class 4, Credit 4

EIEI-599 Independent Study
Registration #0303-599
A supervised investigation within an industrial engineering area of student interest. (Consent)

Class variable, Credit variable

Graduate courses in Industrial Engineering

EIEI-601 Value Analysis
Registration #0303-601
This course examines the nature and measurement of value. The concept and construction of a value index representing average value is related. Numerical estimation methods such as ranking, pair comparison, magnitude estimation, and criteria analysis are explained and used to measure the value of diverse items. The methods used are applicable to the study of a wide variety of problems and have special utility in engineering design studies.

Credit 4

EIEI-620 Engineering Economy
Registration #0303-620
Time value of money, methods of comparing alternatives, depreciation and depletion, income tax consideration, replacement, retirement and obsolescence, and capital budgeting.

Credit 4

EIEI-680 Engineering Planning and Control
Registration #0303-680
A course designed to introduce the student to the basic concepts of long range planning control, and project management. Topics will include budgeting, planning cycles, planning models, and related topics. Related topics will depend on the interest and direction of the class and may include such areas as aggregate planning models (linear decision rule, management coefficient model, search decision rule).

Credit 4

EIEI-685 Patent Law
Registration #0303-685
The course will be primarily directed towards the patent laws of the United States, however, comparisons to the patent laws of other countries will be addressed as appropriate. The course will cover the broad categories of obtaining a patent, the exploitation of a patent, the corporation and patents as well as other patent-related items. Major topics to be specifically addressed include what is patentable under U.S. law, the concept of prior art, techniques used in the preparation of patent applications, the prosecution of a patent application at the U.S. Patent Office, the licensing of patents, the enforcement of patent rights through litigation, the benefits of patents, specific problems involving intellectual property within a corporate environment, trademarks, copyrights, and trade secrets. Emphasis will be placed on practical situations involving the handling of inventions within the corporation and on behalf of an individual inventor.

Credit 4

EIEi-701 Principles of Operations Research I
Registration #0303-701
Applied linear programming. Computational techniques for solving constrained optimization problems. Linear programming, the Simplex method and variations, duality and sensitivity testing.

Credit 4

EIEI-702 Mathematical Programming
Registration #0303-702
Application of non-linear programming techniques. Classical optimization techniques; quadratic, stochastic, integer programming and dynamic programming. Applications to industry. (EIEI-701)

Credit 4

EIEI-705 Survey of Operations Research
Registration #0303-705
A survey course designed to introduce the student to such topics as waiting line analysis, inventory, scheduling, replacement, and simulation. This course is intended to present an integrated view of the field of operations research to students who will take more specialized courses as well as those in other disciplines desiring only a limited exposure to the field.

Credit 4

EIEI-710 Systems Simulation
Registration #0303-710
Methods of modeling and simulating man-machine systems. Model validation, design of simulation experiments, variance reduction techniques, random number generation and distribution generation are discussed. However, emphasis is placed on the G.P.S.S. simulation language.

Credit 4

EIEI-715, 716 Statistical Analysis for
Registration #0303-715, -716 Engineers I & II
A basic two-quarter course in probability and statistics designed to give the student a foundation for further study in areas such as design of experiments, stochastic systems, and simulation.

Credit 4

EIEI-718 Inventory Design
Registration #0303-718
Overview of inventory problems. Single period models under risk and uncertainty, dynamic models under certainty, dynamic models under risk and uncertainty. Forecasting, inventory system analysis.

Credit 4

EIEI-720 Production Control
Registration #0303-720
A systems approach to the design of production control operations. Investigation of forecasting, operations planning, inventory control, and scheduling. Case studies and the design of actual production systems is encouraged.

Credit 4

EIEI-725 Technological Forecasting
Registration #0303-725
Technological forecasting is concerned with the Delphi method, SOON charts, trend extrapolation, relevancy trees, cross input analysis, internally consistent scenarios, and decision matrices. The course will provide a thorough introduction to the basic concepts and techniques of technological forecasting.

Credit 4

EIEI-730 Biotechnology and Human Factors I
Registration #0303-703
Basic functional anatomy and physiology. Human body systems. Anthropometry. Applications on the design for man and man-machine systems. Work physiology. Industrial biomechanics.

Credit 4

EIEI-731 Biotechnology and Human Factors II
Registration #0303-731
Effect of mechanical and physical environment on: physiology, behavior, performance of man. Design considerations to protect man against environmental effects (thermal environment, noise, vibration, acceleration, light, altitude).

Credit 4

EIEI-732 Biotechnology and Human Factors III
Registration #0303-732
Theoretical fundamentals of human body mechanics. Development and applications of biomechanics and biomechanical models. Kinematics of the link system of the body and extremity joints.

Credit 4

EIEI-733 Biotechnology and Human Factors IV
Registration #0303-733
Measurements of human performance. Functions that man performs in man-machine systems. Techniques to quantify man's behavior at work.

Credit 4

EIEI-734 Systems Safety Engineering
Registration #0303-734
Accident study of the human component in occupational systems. Product systems safety analysis. Approaches in accident prevention.

Credit 4

EIEI-771, 772, 773, 774 Special Topics in Industrial
Registration #0303-771, -772, -773, -774 Engineering
This is a variable credit, variable topics course which can be in the form of regular courses or independent study under faculty supervision.

Credit variable (maximum 4 per course number)

Mechanical Engineering

EMEM-331 Mechanics I
Registration #0304-331
For students majoring in computer, electrical and industrial engineering. Statics and introduction to strength of materials, vector algebra, Newton's laws, the principle of transmissibility of forces, couples, centroids, trusses, frames, machines, internal force and moment diagrams for beams, and friction. Axial stresses and strains, statically indeterminate problems, thin-walled pressure vessels, direct shear, and torsion. (SMAM-253, SPSG-205)

Class 4 Credit 4

EMEM-332 Mechanics II
Registration #0304-332
Additional topics in strength of materials and dynamics; stresses and deflections associated with beams in bending; kinematics and kinetics of particles and rigid bodies in one and two dimensions, work-energy methods, and principles of impulse and momentum. (EMEM-331)

Class 4, Credit 4

EMEM-335 Strength of Materials
Registration #0304-335
Relation between stress and strain, deflection of beams, shafts and columns; combined stresses, stress and strain at a point and theories of failure are covered. (SPSP-205, SMAM-253)

Class 3, Lab. 2, Credit 4

EMEM-336 Statics
Registration #0304-336
This basic course in statics of rigid bodies integrates the mathematical subjects of vector algebra and simultaneous linear algebraic equations with the physical concepts of Newton's Law of Statics and Reaction. (SMAM-253, SPSP-205)

Class 4, Credit 4

EMEM-337 Strength of Materials I
Registration #0304-337
This basic course in statics of deformable bodies integrates the mathematical subjects of vector algebra, differential equations, and theory of a continuum with the fundamental physical considerations which govern the mechanics of solids in equilibrium. Topics covered include mechanics of deformable bodies, forces and moments transmitted by slender bodies, stress and strain, and temperature effects on stress-strain relations. (EMEM-336)

Class 3, Lab. 2, Credit 4

EMEM-338 Strength of Materials II
Registration #0304-338
A continuation of Strength of Materials I to include torsion, bending stresses, deflection due to bending, and stability considerations. (EMEM-337)

Class 3, Lab. 2, Credit 4

EMEM-340 Engineering
Registration #0304-340 Communications
The objectives of this course are to provide an elementary knowledge of Fortran programming to study advanced engineering graphics, and to demonstrate the use of computer programming for design and graphics through field trips. Topics covered in the lectures are: terminal and batch processing, arithmetic statements, input-output statements, flow charts, looping, conditional statements, and subroutines. The laboratory sessions are devoted to working drawings, shop processes, mechanical elements, tolerances and fits, assembly and detail drawings, and an introduction to computer graphics. (Second-year standing)

Class 2, Lab. 3, Credit 4

EMEM-343 Materials Processing
Registration #0304-343
A study of the application of machine tools and fabrication processes to engineering materials in the manufacture of products. Topics covered include such metal fabrication processes as cutting, forming, casting, and welding. Plastics are covered from the standpoint of thermosetting and thermo plastic processing. Forming, drying, and firing of ceramics are considered.

Class 3, Lab. 3, Credit 4

EMEM-344 Materials Science
Registration #0304-344
A study of the properties of metallic, organic, and ceramic materials as related to structural imperfections, atom movements, and phase changes. The intent of the course is to develop a bpsic understanding of the structure of materials and to study the behavior of materials in service environments.

Class 3, Lab. 2, Credit 4

EMEM-413 Thermodynamics I
Registration #0304-413
A basic course in the mathematical and physical concepts of thermodynamics. The course presents a rigorous treatment of the zeroth, first and second laws of thermodynamics and their application to gasses, liquids and two-phase mixtures. (SMAM-306, SPSG-206, SPSG-207)

Class 3, Lab. 2, Credit 4

EMEM-414 Thermodynamics II
Registration #0304-414
A continuation of Thermodynamics I stressing application of the basic principles to various energy conversion processes. (EMEM-413)

Class 3, Lab. 2, Credit 4

EMEM-415 Fluid Mechanics I
Registration #0304-415
Fluid statics. Ideal fluid—continuity, momentum and energy equations in integral and differential form, Bernoullis equation; open channel flow, viscous fluid—its characteristics, dimensional analysis, flow through pipe. (SMAM-308, EMEM-413)

Class 3, Lab. 2, Credit 4

EMEM-431 Thermodynamics
Registration #0304-431
A basic course in thermodynamics for electrical engineering students. Applications of the first and second law to closed and open systems; elementary heat transfer considerations.

Class 4, Credit 4

EMEM-437 Introduction to Machine Design
Registration #0304-437
The analysis and theory of machine design and applications to systims design problems; particular emphasis is placed on the design and analysis of machine elements. (EMEM-338)

Class 3, Lab. 2, Credit 4

EMEM-439 Dynamics I
Registration #0304-439
This is a first course in the dynamics of a single particle and a system of practices. Vector algebra is reviewed and vector calculus is introduced in the study of the geometry of motion in two- and three-dimensional space. Newton's Second and Third Laws are used to generate ordinary differential equations of motion which are solved by using classical methods. Finally, Newton's "Universal Law of Gravitation" is developed by using Kepler's three laws of planetary motion. Applications include the kinematics and kinetics of systems of single and multiple particles. (EMEM-336, SMAM-308)

Class 4, Credit 4

EMEM-440 **Numerical Modeling**
Registration #0304-440 **Ior Engineers**
The solution of engineering problems requiring numerical solution. Included are the formulation of mathematical models of the problems, a study of numerical procedures suitable for their solution, the development of computer programs to carry out the procedures, and the analysis of the results. Problems will be taken from the student's background in solid body mechanics and thermodynamics. Extensive use of the computer is required. (EMEM-340, or equivalent computer experience, SMAM-308)

Class 4, Credit 4

EMEM-501 **Mechanical Engineering**
Registration #0304-501 **Laboratory**
A course in experimental methods, with laboratory experiments and lectures on the underlying theory. Topics considered are design of experiments, experimental error and error analysis including some statistical analysis of data, calibration of equipment, presentation of results in engineering reports. The theory and use of measuring devices for the determination of strain, pressure, temperature, flow rate, vibration, etc., and transient response of transducers.

Class 2, Lab. 4, Credit 4

EMEM-514 **Heat Transfer**
Registration #0304-514
A basic course in the fundamentals of heat transfer by conduction, convection, and radiation together with application to typical engineering systems. Topics covered include steady and unsteady conduction, combined modes, fins, heat exchangers, boiling and condensation, and numerical and graphical techniques. (EMEM-413, EMEM-415)

Class 4, Credit 4

EMEM-516 **Fluid Mechanics II**
Registration #0304-516
A continuation of Fluid Mechanics I with introduction to one dimensional compressible flow in convergent-divergent nozzle, normal shock, choking. Lift and drag, potential flow around a cylinder, qualitative discussion of Navier-Stokes equations; Couette and Poiseuille flows, laminar and turbulent boundary layer on flat plate. (EMEM-415)

Class 4, Credit 4

EMEM-543 **Dynamics II**
Registration #0304-543
Vector algebra and vector calculus are used to develop Euler's equations to motion as applied to rigid bodies in two-and three-dimensional motion. A disciplined method of attack is presented, from hypothesis to conclusion, so that the student can predict, through calculation,the behavior of engineering components and systems containing reasonably rigid bodies. When these bodies are acted upon by force systems, time permitting vibration of rigid bodies is introduced along with systems of variable mass. (EMEM-439)

Class 4, Credit 4

EMEM-544 **Physical Systems I**
Registration #0304-544
Basic concepts and analytical procedures are introduced and developed so that the student can mathematically model and analyze physical systems. The analogs of resistance, capacitance, and inductance are developed for electrical, mechanical, thermal and fluid systems. Block diagrams are used as conceptual tools, and Bode plots are introduced and used to display the magnitude frequency and phase frequency responses of various systems. Applications include the analysis of some seismic instruments. A laboratory in which the analog computer is introduced and used is a part of this course. This course completes the required core of courses in the mechanics of sequence. (EMEM-543)

Class 3, Lab. 2, Credit 4

EMEM-599 **Independent Study**
Registration #0304-599
An assigned project encompassing both analytical and experimental work integrating the student's education in mechanical engineering.

Class variable, Credit variable

Technical Electives in Mechanical Engineering

EMEM-632 **Advanced Mechanical Systems**
Registration #0304-632 **Design**
Optimization of system response to deterministic inputs. Various mechanical systems in use will be analyzed and studies will be made to improve them. Both the analog and the digital computer are used. (EMEM-672)

Class 4, Credit 4

EMEM-635 **Industrial Heat Transfer**
Registration #0304-635
The course is intended to acquaint students with the design of heat transfer equipment with an emphasis on heat exchangers. Each student is required to submit an individual or group project on a practical heat transfer problem to reinforce his or her classroom experience. (EMEM-514)

Class 4, Credit 4

EMEM-650 **Gas Dynamics**
Registration #0304-650
An advanced course in fluid mechanics covering topics such as introduction to continuum mechanics; small disturbances in ideal, compressible, inviscid media; one-dimensional isentropic flow; and normal shock waves. (EMEM-415)

Class 4, Credit 4

EMEM-651 **Viscous Flow**
Registration #0304-651
An advanced course in fluid mechanics covering topics such as introduction to continuum mechanics; some exact solutions to the Navier-Stokes equation; boundary layer concepts; and introduction to turbulent flow. (EMEM-415)

Class 4, Credit 4

EMEM-652 **Fluid Mechanics of Turbomachinery**
Registration #0304-652
Building on a background in thermodynamics and fluid mechanics, this course will develop the basic relationships for energy transfer between a rotor and a fluid. Application of the fundamentals of turbomachine fluid mechanics will be to such devices as radial flow and axial flow turbines. Both compressible and incompressible fluid machinery will be considered. (EMEM-415)

Class 4, Credit 4

EMEM-660 **Refrigeration and Air Conditioning**
Registration #0304-660
A basic course in the principles and the applications of refrigeration and air conditioning involving mechanical vapor compression and absorption refrigeration cycles, associated hardware, psychrometrics solar radiation, heat transmission in buildings, and thermodynamic design of air conditioning systems. Students are expected to do a design project. (EMEM-414)

Class 4, Credit 4

EMEM-664 **Engineering Acoustics and**
Registration #0304-664 **Noise Control**
A basic course in the principles of acoustics and the application of sound measurements and noise control in industry and the community. Topics to bo covered will include an introduction to wave theory; properties of sound waves such as the various classifications of sound levels, pressure characteristics, sound combinations, and loudness levels; instrumentation and measurement; sound fields; noise sources; sound control; and noise control criteria.

Class 4, Credit 4

EMEM-667 **Introduction to Air Pollution**
Registration #0304-667
An exploratory study of atmospheric dynamics, source emission, sulphurous and photochemical smog, aerosols, and pollution control including devices, air quality standards and enforcement.

Class 4, Credit 4

EMEM-669 Introduction to Water Pollution
Registration #0304-669
Water supply requirements and waste water volumes; transportation and waste water systems; physical, chemical and biological processes for treatment of waste water and sludges, unit processes hydraulics and design of sewers; reuse of water.

Class 4, Credit 4

EMEM-670 Thermal Stresses
Registration #0304-670
Thermal stresses in bars, rings, beams, plates, and shells; energy methods; introduction to dynamical problems and to viscoelastic stress analysis.

Class 4, Credit 4

EMEM-672 Selected Machine Elements
Registration #0304-672
This course should treat some of the machine elements discussed in EMEM-532 to a larger extent and introduce machine elements not previously discussed and of a more complex nature. Optimization techniques can be applied. (EMEM-532)

Class 3, Lab. 2, Credit 4

EMEM-676 Kinematic Analysis of Mechanisms
Registration #0304-676
A course in mechanisms: motion, velocity, acceleration analysis; the design of linkages, cams, special gearing, variable speed drives. (EMEM-532)

Class 3, Lab. 2, Credit 4

EMEM-677 Modern Energy Conversion
Registration #0304-677
Principles of energy conversion, introduction to semiconductors, thermoelectric generators, photovoltaic generators, thermoionic generators, magnetohydrodynamic power generators. (EMEM-414)

Class 4, Credit 4

EMEM-679 Dynamics of Physical Systems II
Registration #0304-679
A continuation of EMEM-544. Review of stability analysis techniques; Nyquist stability criterion; design and compensation of feedback control systems; non-linear system analysis; introduction to state variable time-domain analysis of control systems. Students will be required to undertake team projects involving the design, analysis and fabrication of a device or system incorporating control and feedback principles. (EMEM-544)

Class 3, Lab. 2, Credit 4

EMEM-680 Advanced Thermodynamics
Registration #0304-680
This course provides a general, postulative approach to macroscopic thermodynamics by means of a mathematical formalism developed around axioms concerning equilibrium and stability. Applications of the formalism to chemical, electrical, magnetic, and stressed solid systems are considered. (EMEM-414)

Class 4, Credit 4

EMEM-685 Advanced Strength of Materials
Registration #0304-685
Statically indeterminate problems for beams; frames; continuous beams; beams of variable cross section, reinforced-concrete beams; beams on elastic foundation; stability of columns; plastic deformation in bending and torsion; limit analysis; energy methods with applications to beams, curved bars, and frames; rotating disks; introduction to bending of plates. (EMEM-338)

Class 4, Credit 4

EMEM-689 Patent Law and Protection
Registration #0304-689
A study of protection of intellectual property including study of patent rights, inventions, procedures for obtaining patents as well as a study of the law and drafting techniques of patents and their claims. Insights to invention protection and legal ramifications of inventor's and attorney's activities will be included.

Class 4, Credit 4

EMEM-690 Environment and the Engineer
Registration #0304-690
This course will study the role of engineers in society and in particular their responsibility in the analysis and solution of the problems facing the environment in an increasingly technological society. Problems to be studied from a "case study" standpoint will include such things as air, water, and noise pollution, thermal pollution, and the effects of population growth. The course will include field trips, outside expert speakers, and each student will be expected to participate in the in-depth study of one problem of particular interest to him or her and to submit a formal report to the class. Use of the digital and analog computing facilities as a systems simulation tool will be encouraged.

Class 4, Credit 4

EMEM-694 Stress Analysis
Registration #0304-694
Experiments and lectures on topics in stress analysis; non-symmetric bending, composite beams, curved beams, thick-walled cylinders, torsion, stress concentrations, plastic behavior, contact stresses; complex stresses; experimental verification of the theories of failure; energy methods; experiments with strain gages, photoelasticity applications, and brittle coatings. (EMEM-338)

Class 3, Lab. 2, Credit 4

EMEM-695 Solid Waste Management
Registration #0304-695
A study of the practices and processes of solid waste disposal. In addition to the technical aspects, special emphasis is placed on the socio-political, economic, and environmental aspects of solid waste management. Course format is that of an engineering design case study.

Class 4, Credit 4

EMEM-696 Nuclear Power
Registration #0304-696
A first course in nuclear engineering: brief review of nuclear physics related to fission, fusion, and radiation emission; use of radioisotopes; biological effects of radiation and shielding; steady state reactor theory and reactor control.

Class 4, Credit 4

Graduate Courses in Mechanical Engineering

EMEM-692* Analysis for Engineers
Registration #0304-692*
Partial differentiation, chain rule, and total differential; multiple integration and manipulation of multiple integrals; linear constant coefficient ordinary differential equations; vector algebra and differentiation of vectors or complex variables.

Credit 4

EMEM-693* Thermo Fluid System Analysis
Registration #0304-693*
Thermodynamic properties and processes, ideal and real gas, vapors and gases; laws of thermodynamics and selected power cycles; fluid statics; control volume and conservation of mass, momentum and energy; Bernoulli's equation; viscosity, loss of heat due to friction (flow through pipes), concept of boundary layer; basic law of conduction; convection; radiation.

Credit 4

EMEM-699* Applied Mechanics System Analysis
Registration #0304-699*
Methods currently employed in component and system analysis of the static and dynamic behavior of rigid and elastic bodies. The topics will include a review and advanced studies of vector statics and dynamics of rigid and elastic bodies and systems.

Credit 4

**These courses are provided for students who have been out of school for a number of years and feel it necessary to review or update their educational background.*

EMEM-800 Applied Engineering Analysis I
Registration #0304-800
Use of matrices including matrix algebra, matrix inversion, diagonalization of matrices, eigenvalues and eigenvectors; application of matrices to the solution of sets of linear ordinary differential equations; the solution of partial differential equations by separation of variables using orthogonal functions, including Bessel functions; introduction to LaPlace transforms.

Credit 4

EMEM-801 Applied Engineering Analysis II
Registration #0304-801
Theory of complex variables including analytic functions, mapping, power series, and residues; application of complex variables, La-Place and Fourier transform inversion for solving partial differential equations. «

Credit 4

EM EM-802 Applied Engineering Analysis III
Registration #0304-802
Introduction to optimization techniques: calculus of variations, Hamilton's principle, Rayleigh-Ritz method; Volterra and Fredholm integral equations with applications. (EMEM-801)

Credit 4

EMEM-806 Numerical Analysis
Registration #0304-806
Numerical methods for solving algebraic and transcendental equations, finite difference methods, error and convergence analysis, numerical methods of solutions of initial value and boundary value problems in engineering. Extensive use of computer is anticipated. (Graduate standing)

Credit 4

EMEM-810 Introduction to Continuum Mechanics
Registration #0304-810
Cartesian tensors and indicial notation. Analysis of the stress and deformation in a continuous media. Introduction to the linear theory of elasticity and the mechanics of fluids. (SMAM-308 or EMEM-692)

Credit 4

EMEM-811 Theory of Elasticity
Registration #0304-811
Formulation of elasticity problems. Plane strain, plane stress solutions by potentials, torsion, thick cylinders, disks, and spheres, advanced problems of bending of beams, curved beams. The semi-infinite medium and related problems. Stability problems. (EMEM-810)

Credit 4

EMEM-812 Theory of Plates and Shells
Registration #0304-812
Theory of thin plates for small deflections. Rectangular and circular plates with various boundary conditions, elliptic and triangular plates. Membrane theory of shells, cylindrical shells, pressure vessels, shells of revolution. (EMEM-811)

Credit 4

EMEM-813 Energy Methods in Mechanics
Registration #0304-813
Energy principles: virtual work, Betti theorem, Castigliano's theorems, Rayleigh-Ritz method. Statics of structure: beams, flames, rings, and columns. Matrix methods. Dynamics of structures: free and forced vibrations for structures with one degree of freedom, many degrees of freedom. Continuous structures. (EMEM-811)

Credit 4

EMEM-815 Experimental Stress Analysis
Registration #0304-815
Experimental methods of analysis of structural machine members, including strain gages and instrumentation, photoelastic methods, brittle coating, Moire fringe method, holographic techniques; and the hydrodynamic, electrical, and membrane analogs. Laboratory tests of models. (EMEM-694 or equivalent)

Credit 4

EMEM-816 Finite Elements !
Registration #0304-816
Development of theory from variational principles. Two- dimensional applications to elastic continua, considering plane stress, plane strain, and axisymmetric loading examples. Problem-solving sessions using RIT computer. Applications in structural mechanics, considering beam elements, plate elements, and shell elements. Utilization of these elements in solving specific structural problems. Introduction to three-dimensional stress analysis. Features of large general-purpose computer programs.

Credit 4

EMEM-818 Finite Elements II
Registration #0304-818
Variational principles for linear and nonlinear elements. Three-dimensional element derivations using natural coordinate systems. Solid elements, tetrahedron and hexahedron: various thin shell elements. Computer workshops with use of various programs demonstrating the above theory.

Credit 4

EMEM-820 Analytical Mechanics
Registration #0304-820
Brief review of vectorial mechanics with emphasis on the dynamics of rigid bodies and applications to systems of degrees. Introduction to continuum using the limiting case of a system with an infinite degree of freedom. (Graduate standing or departmental approval)

Credit 4

EMEM-821 Vibration Theory and
Registration #0304-821 Applications I
Vibration of discrete multi-mass systems using matrix methods. Normal mode theory, and matrix eigenvalue extraction procedures. Matrix forced response. Practical examples using two and three degrees of freedom. Computer situations.

Credit 4

EMEM-822 Vibration Theory and
Registration #0304-822 Applications II
Analysis of vibrations of linear continuous systems, involving beams, frames, plates, and shells. Solution by classical methods or by approximate methods, as expedient. Introduction to finite-element analysis of vibration. System analysis techniques such as mobility and receptance methods. Applications of methods discussed to practical problems.

Credit 4

EMEM-825 Lubrication
Registration #0304-825
Incompressible lubrication in one-dimensional and finite journal bearings, hydrodynamic gas bearings, hydrostatic bearings, squeeze film and dynamic loading, rolling elements, thrust bearings, sliding bearings. Design considerations. (EMEM-415)

Credit 4

EMEM-826 Materials, Principles and Selection
Registration #0304-826
A study of the principles of material behavior as applied to design. Application of these materials according to these principles is stressed. Ferrous and non-ferrous materials are covered. Among the possible topics are strength, hardness, corrosion, fatigue, economy, forming, wear resistance, dimensional stability, heat treating, welding, and machining. (EMEM-344)

Credit 4

EMEM-828, 829 Special Topics in
Registration #0304-828, -829 Applied Mechanics
An opportunity for the advanced student to undertake an independent investigation in the area of applied mechanics. Assistance will be given only when the student requests it. The project may be a comprehensive literature investigation, theoretical study, or an investigation involving laboratory experiment.

Credit variable (maximum of 4 credits/quarter)

EMEM-830 Heat Transfer I
Registration #0304-830
The formulation of conduction heat transfer problems. Solutions to steady state and unsteady state problems by separation of variables, LaPlace transforms and numerical methods. Emperical methods for forced convection and their use in the design of industrial systems. (EMEM-514)

Credit 4

EM EM-833 Heat Transfer II
Registration #0304-833
Principles of natural and forced convection, thermal boundary layers and their solutions. Convection heat transfer systems such as flows inside tubes, outside tubes, and over external surfaces. Emperical relations; applications to heat exchangers; nature of thermal radiation, radiation properties of surfaces and gases, radiant energy interchange in an enclosure filled with participating media. Problems involving simultaneous conduction, convection, and radiation. (EMEM-514)

Credit 4

EMEM-835 Thermodynamics
Registration #0304-835
An advanced study of thermodynamic equilibrium and stability. The thermodynamics of chemical reactions, combustion and flame phenomenon, phase change, stressed solids and other topics depending on the interest of the students. An introduction to irreversible thermodynamics.

Credit 4

EMEM-836 Statistical Thermodynamics
Registration #0304-836
The relationship between macroscopic thermodynamic properties and microscopic behavior of matter. Calculation of macroscopic thermodynamic properties using Maxwell-Boltzmann, Fermi-Dirac and Bose-Einstein statistics. Determination of transport properties from kinetic theory of gases.

Credit 4

EMEM-840 Fluid Dynamics
Registration #0304-840
Selected topics from hydrodynamics, compressible flow, viscous flow, hydrodynamic instability and turbulence, depending on interests of the students. (EMEM-415)

Credit 4

EMEM-841 Gas Dynamics
Registration #0304-841
Governing equations of compressible isentropic flow through nozzles and diffusers. Perturbation techniques and sound waves. Subsonic and supersonic flow, mach cones. Theory of characteristics, rarefaction and compression waves. Normal shock waves in a converging/diverging nozzle and in front of a moving piston. Hugoniot relations across a shock. The shock tube. One-dimensional flow with friction, Fanno line flow.

Credit 4

EMEM-848, 849 Special Topics In Thermo
Registration #0304-848, -849 Fluid Systems
An opportunity for the advanced student to undertake an independent investigation in the area of thermo fluid systems. Assistance will be given only when the student requests it. The project may be a comprehensive literature investigation, a theoretical study, or an investigation involving laboratory experiment.

Credit variable (maximum of 4 credits/quarter)

EMEM-851 Automatic Control Systems I
Registration #0304-851
A first course in control systems analysis at the graduate level. Topics include mathematical modeling and response of lumped-parameter systems, stability analysis and multi-variable techniques. Bode and root-locus analysis of feedback systems. Compensation is introduced. Physical systems and analog computer used for lecture demonstrations throughout the course. Level of mathematical rigor is sufficiently above "classical" undergraduate controls course to allow those with previous undergraduate background to take this course.

Credit 4

EMEM-852 Automatic Control Systems II
Registration #0304-852
A continuation of EMEM-851. Topics include Nyquist plots and stability theorem, Nichols charts, compensation, state-space formulation of multi-variable systems and non-linear systems. Students will undertake individual projects requiring both analytical and experimental work. Individual use of analog and digital computers is encouraged. (EMEM-851)

Credit 4

EMEM-854 Optimal Control Systems Design
Registration #0304-854
An advanced study of feedback systems in terms of optimal and adaptive control. Variational calculus, the maximum principle, Hamilton-Jacobi theory, criteria for optimal design, constrained and unconstrained optimization, examples of optimal systems control. Introduction to the adaptive problem, gradient methods and examples of adaptive or self-optimizing control systems. (EMEM-851,852, 800)

Credit 4

EMEM-857 Advanced Topics In Systems Analysis
Registration #0304-857
A project-oriented course examining a spectrum of feedback systems and problems. Systems to be studied include mechanical, electromechanical, optical, biomedical, and systems associated with transportation: hybrid propulsion systems, car-driver interaction, vehicular traffic flow and high-speed vehicle guidance systems. (Subject to instructor's approval)

Credit 4

EMEM-858, 859 Special Topics In
Registration #0304-858, -859 Systems Analysis
An opportunity for the advanced student to undertake an independent investigation in the area of systems analysis. Assistance will be given only when the student requests it. The project may be a comprehensive literature investigation, a theoretical study, or an investigation involving laboratory experiment.

Credit variable (maximum of 4 credits/quarter)

EMEM-861 Engineering Hydrology
Registration #0304-861
A study of the dynamics of the physical processes involving the waters of the earth. Included in the course will be: the meaning of hydrology, the hydrological cycle, transport processes, physical composition of the atmosphere, physical composition of oceans and lakes, planetary fluid mechanics, circulation of the atmosphere, and precipitation.

Credit 4

EMEM-862 Solid Wastes Engineering
Registration #0304-862
A study of the collection, processing, disposal and reuse of solid wastes of municipal, industrial, and agricultural origin. A discussion of the basic design parameters of landfilling, burning, and processing solid wastes. A presentation of considerations of importance to the development of workable regional and municipal management systems.

Credit 4

EMEM-890 Research and Thesis Guidance
Registration #0304-890
In conference with a thesis advisor, a topic is decided on, and either a theoretical or laboratory type research program is carried out. Periodic progress reports and final written thesis with oral examination.

Credit variable (maximum 12 credits total)

College of Fine and Applied Arts

School of Art and Design

FADC-301, 302, 303 Introduction to
Registration #0402-301, -302, -303 Communication Design
An introduction to the complex field of communication design through explorations of formal and perceptual understanding and control; deals with point, line, shape, color, pattern, organizational systems, Gestalt principles, dimension interaction and communications. The relationship of typography and photography to communication design is included. (Foundation program or equivalent).
Recommended co-related courses include introductory photography, introductory typography, photomechanics, motion picture, and television. No special sequence required.

Lab. 9, Credit 3

FADC-401, 402, 403 Communication Design
Registration #0402-401, -402, -403 (Junior Major)
Creative problem solving experiences relating to visual communication imagery based on strong emphasis of formal design values and their utilization for the communication of ideas. Assignments oriented to building a working knowledge of communication media areas such as print, television, film, photography, multi-media presentation, etc. Media Center facility available for extension and application of studio experiences. (FADC-301, 302, 303 or equivalent)

Lab. 12, Credit 6

FADC-411, 412, 413 Communication Design
Registration #0402-411, -412, -413
An elective providing the opportunity to carry on problem solving in the communications area. Each quarter concentrates on specific design topics of study.

Lab. 6, Credit 3

FADC-501, 502, 503 Communication Design
Registration #0402-501, -502, -503 (Senior Major)
Advanced creative problem solving experiences relating to visual communication imagery based on a strong emphasis of formal design values and their utilization for the communication of ideas. Assignments oriented to include media application in solving human needs, community, and environmental problems.

Lab. 27, Credit 9

FADC-511, 512, 513 Communication Design
Registration #0402-511, -512, -513
A professional elective providing the opportunity to carry on the objectives of the communicating arts. Each quarter concentrates on specific topics of design study.

Lab. 6, Credit 3

FADC-520 Professional Design Business Practices
Registration #0402-520 and Ethics
Ethical principles will be discussed along with sound business practices; setting up in business; invoicing and costing;the designer and the law; professional associations.

Class 3, Credit 3

FADD-301 Environmental Design—Exhibit
Registration #0403-301
Introduction to the integration of graphics, structure, three-dimensional form and space in the design of an exhibit system. (Foundation program or equivalent)

Lab. 6, Credit 3

FADD-302 Environmental Design—Product
Registration #0403-302
Introduction to the design process of developing a simple utilitarian product for a specific use. (Foundation program or equivalent)

Lab. 6, Credit 3

FADD-303 Environmental Design—Interior
Registration #0403-303
Introduction to the planning of interior space for a particular activity. (Foundation program or equivalent)

Lab. 6, Credit 3

FADD-320 Design Technology—Graphic
Registration #0403-320 Visualization
Graphic visualization techniques for the development and presentation of concepts for three-dimensional designs. Familarization with various media in developing and improving graphic communication skills of value to the designer.

Lab. 6, Credit 3

FADD-311, 312, 313 Environmental Design
Registration #0403-311, -312, -313
Introductory instruction and specified projects in environmental design.
311 - Industrial design
312 - Interior design
313 - Exhibit design

Lab. 6, Credit 3

FADD-401 Environmental Design—Furniture
Registration #0403-401
Elements of design for the furniture industry including anthropometric considerations, methods and materials of manufacture, performance criteria, and marketing requirements. (Foundation program or equivalent)

Lab. 12, Credit 6

FADD-402 Environmental Design—Product
Registration #0403-402
The design of products for manufacture emphasizing human factors, consumer safety, production procedures, and appropriateness of materials and form. (Foundation program or equivalent)

Lab. 12, Credit 6

FADD-403 Environmental Design—Interior
Registration #0403-403
Design elements of the interior environment including the organization and function of space, acoustics, lighting, color, thermal control, safety and security. (FADE-301, 302, 303 or equivalent)

Lab. 12, Credit 6

FADD-411, 412, 413 Design Applications
Registration #0403-411, -412, -413
An elective that provides projects of the student's choosing in industrial design, display, interiors and packaging. These projects are developed through visuals, materials and processes.

Lab. 6, Credit 3

FADD-501 Environmental Design—Product,
Registration #0403-501 Package, Graphics
Comprehensive design of interrelated product, package and graphic identity elements for consumer safety and convenience as well as the marketing function.

Lab. 18, Credit 9

FADD-502 Environmental Design—Interior,
Registration #0403-502 Product Systems
Design of component interior and product systems for particular environments or facilities.

Lab. 18, Credit 9

FADD-503 Environmental Design—Thesis
Registration #0403-503
Directed design project allowing individual program emphasis. (FADE-401, 402, 403)

Lab. 18, Credit 9

FADD-511, 512, 513 Design Applications
Registration #0403-511, -512, -513
An elective that provides additional emphasis on professional procedures, functions, structure and processes as they apply to the design environment.

Lab. 6, Credit 3

FADF-201, 202, 203 Design (Craft* Major)
Registration #0404-201, -202, -203
The elements of design and color and their structural relationship as applied to problems in two and three dimensions.

Lab. 6, Credit 3

FADF-205, 206, 207 Creative Sources
Registration #0404-205, -206, -207
This course is designed to make students aware of their environment, their physical being and their experiences as tools for creative problem solving. This will be accomplished through lectures, individual and group assignments and demonstrations.

Class 1, Lab. 1, Credit 2

FADF-210, 211, 212 Drawing
Registration #0404-210, -211, -212
A basic foundation in drawing as a form of creative expression. Through the use of organic and inorganic materials attention is given to individual response to "seeing as interspersed with all sensory conditioning. The figure is utilized in the analysis action, structure, and gesture through quick sketches.

Lab. 9, Credit 4

FADF-221, 222, 223 Photo Design I
Registration #0404-221, -222, -223
The elements of design and color and their structural use as related to problems in two- and three-dimensional applications.

Lab. 6, Credit 2

FADF-230, 231, 232 Design
Registration #0404-230, -231, -232
The elements of design and color and their structural relationship as applied to problems in two dimensions.

Lab. 6, Credit 3

FADF-240, 241,242 Design
Registration #0404-240, -241, 242
The elements of design and color and their structural relationship as applied to problems in three dimensions.

Lab. 6, Credit 3

FADF-261, 262, 263 Drawing (Craft Majors)
Registration #0404-261, -262, -263
Drawing in a variety of media. Introduction to line, form, and color as elements of pictorial expression. Organic and inorganic materials are used.

Lab. 6, Credit 3

FADF-321, 322, 323 Photo Design II
Registration #0404-321, -322, -323
Emphasis upon problems which are related to visual phenomena, fundamentals, and communications.

Lab. 3, Credit 2

FADP-301, 302, 303 Advanced Drawing
Registration #405-301, -302, -303
Three-quarter core course for fine arts program in painting and printmaking. Initial emphasis placed upon objective mastery of form and space from a variety of sources. Study of the human figure including skeletal structure and superficial anatomy. Further development of drawings as a conceptual means with expanded media.

Lab. 6, Credit 3

FADP-313 Medical Illustration Carbon Dust Technique
Registration #0405-313
Introduction to carbon dust illustration techniques. Beginning sequence of illustrative techniques leading to mastery of medical illustration. Emphasis upon a professional approach.

Lab. 6, Credit 3

FADP-320 Color
Registration #0405-320
One quarter course dealing with the examination of basic color phenomena by visual comparison. Study of differences between light and pigment. Class problems exploring such relationships as intensity, vibration, temperature, after-image, spatial effects and image-ground distortion.

Class 2, Lab. 3, Credit 3

FADP-401, 402, 403 Painting
Registration #0405-401, -402, -403
Beginning sequence of advanced painting leading to major course of study in the fine arts. Formal values in painting related to individual expression in studio production. Examination and exploration of concepts underlying contemporary art in study sessions directed by the fine art staff. Advanced drawing incorporated into studio procedure. (FADP-301, 302, 303)

Lab. 12, Credit 6

FADP-411, 412, 413 Painting
Registration #0405-411, -412, -413
An elective providing the opportunity for exploration of personal expressive styles through a painting media.

Lab. 6, Credit 3

FADP-420 Illustration
Registration #0405-420
One-quarter course exploring the art of illustrators; their relation to audience, publishers, and media. Studio problems will develop and expand basic concepts of all illustration from children's books to that of heavy industry.
Studio sessions will be devoted to illustrative problems that reflect the class study for that period. Class critiques at appropriate times.

Class 3, Lab. 3, Credit 3

FADP-421, 422, 423 Medical Illustration Applications
Registration #0405-421, -422, -423
Development of range and mastery of medical illustration techniques. Laboratory sessions scheduled in bio-medical illustration. (Lab orientation sessions to be scheduled in operating room facilities.)

Lab. 6, Credit 5, Fall
Lab. 12, Credit 8, Winter, Spring

FADP-501, 502, 503 Painting
Registration #0405-501, -502, -503
Second year of advanced painting completing a major course of study in the fine arts. Concentrated studio production focused upon individual creative solutions. Staff directed sessions examining the relation of the artist to his or her culture and society. Advanced drawing incorporated into studio procedure. (FADP-401, 402, 403)

Lab. 18, Credit 9

FADP-511, 512, 513 Painting
Registration #0405-511, -512, -513
An elective that provides further exploration of personal expressive styles through a painting media.

Lab. 6, Credit 3

FADP-531, 532, 533 Advanced Medical Illustration
Registration #0405-531, -532, -533
Advanced medical illustration techniques. Graphic Design related to illustrative and photographic practice. Lab sessions to be scheduled in operating room facilities.

Jointly sponsored between RIT and the University of Rochester.

Lab. 18, Credit 6

FADR-401, 402, 403 Printmaking
Registration #0406-401, -402, -403
Design projects applied to the techniques of lithography, wood block, and etching. (FADP-301, 302, 303)

Lab. 12, Credit 6

FADR-411, 412, 413 Printmaking
Registration #0406-411, -412, -413
An elective providing the opportunity to explore personal statements through lithography, etching and relief (one per quarter).

Lab. 6, Credit 3

FADR-501, 502, 503 Printmaking
Registration #0406-501, -502, -503
Continuation of third-year practices. Opportunity is presented for a major concentration in a particular medium. (FADR-401, 402. 403)

Lab. 18, Credit 9

FADR-511, 512, 513 Printmaking
Registration #0406-511, -512, -513
An elective that provides further exploration of printmaking with emphasis on personal statement.

Lab. 6, Credit 3

FADS-411, 412, 413 Sculpture
Registration #0407-411, -412, -413
The course develops formal sculptural concepts through a variety of processes and materials. Studio practice involving work in paper, wood, fabrics, metal, stone, clay, and plastics. This course is offered on the sophomore, junior, and senior level.

Lab. 6, Credit 3

School for American Craftsmen

FSCC-200 Ceramics Materials and Processes
Registration #0409-200
Sequential course for three quarters providing fundamentals of the preparation and use of clay, Methods of fabrication from hand building to wheel-thrown wares. Mold-making, slip casting, and jiggering; ceramic sculpture and decorative techniques. Chemistry and application of glazes. Stacking and firing of kilns. The organization of the ceramic shop, with planning for efficient production. Survey of pottery.

Lab. 15, Credit 5

FSCC-251, 252, 253 Ceramics Craft Elective I
Registration #0409-251, -252, -253
An elementary course in design and techniques in ceramics.

Lab. 6, Credit 3

FSCC-300 Ceramics Materials and Processes
Registration #0409-300
Sequential course for three quarters providing intensive work on individual clay and glaze problems. Designing for production and production problems. Ceramic raw materials, sources of supply, use and maintenance of equipment. Independent study, papers, reports.

Lab. 15, Credit 5

FSCC-351, 352, 353 Ceramics Craft Elective II
Registration #0409-351, -352, -353
An elective course providing an opportunity for more advanced study in ceramics.

Lab. 6, Credit 3

FSCC-400 Ceramics Materials and Processes
Registration #0409-400
Sequential course for three quarters, treating problems of maintenance and construction of equipment. Summary of kiln types, fuels, and construction. Materials and sources of supply. Development of bodies and glazes for specific purposes. Problems requiring new uses, adaptations, and applications. Independent study, papers, reports.

Lab.-15, Credit 5

FSCC-500 Ceramics Techniques and Thesis
Registration #0409-500
Sequential course for three quarters, treating problems related to ceramic production culminating in a research and thesis project.

Lab. 24, Credit 8

FSCF-225, 226, 227 Arts and Civilization
Registration #0410-225, -226, -227
Survey of the history of art from prehistory to the present, with particular attention given to the social and cultural backgrounds of art production and to the relationship between the arts—architecture, sculpture, painting, and decorative arts and crafts. Lectures, independent study, discussion groups assigned gallery visits, papers, reports.

Class 3, Credit 3

FSCF-325, 326 American Art
Registration #0410-325, -326
A course in American art from the colonial period to the present. Lectures, independent study, discussion groups, assigned gallery visits, papers, reports.

Class 3, Credit 3

FSCF-327 Contemporary Tendencies in Art
Registration #0410-327
The development of arts in the 20th century, and current characteristics and goals of expression in architecture, sculpture, and painting. Lectures, independent study, discussion groups, assigned gallery visits, papers, reports.

Class 3, Credit 3

FSCG-200 Glass Materials and Processes
Registration #0411-200
Sequential course for three quarters, treating the organization and construction of the glass studio, including the design and fabrication of furnaces, annealing ovens, burners, tools, and grinding equipment. The function and care of hand and machine glassworking tools. An analysis of glass as a material: its history, chemical makeup, intrinsic qualities, and potential. Fundamental techniques of glass fabrication, including gathering, marvering, and blowing the bubble; blocking; jacking; and puntying the piece.

Lab. 15, Credit 5

FSCG-251, 252, 253 Glass Craft Elective I
Registration #0411-251, -252, -253
An elementary course in design and techniques in glass.

Lab. 6, Credit 3

FSCG-300 Glass Materials and Processes
Registration #0411-300
Sequential course for three quarters, providing an analysis and discussion of glass design and problems of fabrication. Intensive work on assigned production problems. An introduction to the use of cold working techniques; slump molds, lamination, non-glass surface decoration, etching, sand blasting, grinding, etc. The use of and maintenance of equipment, research projects, papers, and reports.

Lab. 15, Credit 5

FSCG-351, 352, 353 Glass Elective II
Registration #0411-351, -352, -353
An elective course providing an opportunity for more advanced study in glass.

Lab. 6, Credit 3

FSCG-400 Glass Materials and Processes
Registration #0411-400
Sequential course for three quarters, introducing glass materials and their source of supply. An introduction to the mixing of batch glass. The formulation of various glass batches with an in-depth analysis of color and fuming techniques. The development of special glass batches for unique and specific purposes. At this stage the student will have developed a personal direction and rapport with glass.

Lab. 15, Credit 5

FSCG-500 Glass Techniques and Thesis
Registration #0411-500
Sequential course for three quarters, introducing problems related to glass fabrication, culminating in a research and thesis project. The student is expected to organize and present an exhibition of his or her work in a manner to reflect a continuity and growth of style.

Lab. 24, Credit 8

FSCM-200 Metalcrafts Materials
Registration #0412-200
Sequential course for three quarters, introducing basic exercises in the use of equipment and metalcrafts techniques through jewelry design and production in various metals. Fundamental techniques in hollow ware; raising, forming, and planishing copper, bronze, brass, and pewter. Enameling techniques. Discussion of design, materials, processes, and equipment.

Lab. 15, Credit 5

FSCM-251, 252, 253 Metalcrafts Elective I
Registration #0412-251, -252, -253
An elective course providing an opportunity for more advanced study in metals.

Lab. 6, Credit 3

FSCM-300 Metalcrafts Materials
Registration #0412-300 and Processes
Sequential course for three quarters, introducing study of jewelry, hollow ware, and flat ware design, with production work in these areas. Analysis and discussion of design and production problems. Independent study, papers, reports.

Lab. 15, Credit 5

FSCM-351, 352, 353 Metalcrafts Elective II
Registration #0412-351, -352, -353
An elective course providing an opportunity for more advanced study in metals.

Lab. 6, Credit 3

FSCM-400 Metalcrafts Materials
Registration #0412-400 and Processes
Sequential course for three quarters, providing individual projects based on techniques presented in the second year. The survey of contemporary practice, including field trips. Lectures and research on decorative techniques. Independent study, papers, reports.

Lab. 15, Credit 5

FSCM-500 Metalcrafts Techniques and Thesis
Registration #0412-500
Sequential course for three quarters, providing individual research in technical problems including a summarizing thesis.

Lab. 24, Credit 8

FSCT-200 Textile Materials and Processes
Registration #0413-200
Sequential course for three quarters, providing fundamentals of fabric design, yarn calculation, and pattern drafting. Analysis of equipment and problems. Practice in basic weaves. Experiment in design and weaving of sample warps of drapery, linens, upholstery, and suiting fabrics. Study of qualities and color combinations of various yarns. Yardage weaving. Printing procedures: silk screen techniques.

Lab. 15, Credit 5

FSCT-251, 252, 253 Textile Craft Elective I
Registration #0413-251, -252, -253
An elementary course in design and techniques in textiles.

Lab. 6, Credit 6

FSCT-300 Textile Materials and Processes
Registration #0413-300
Sequential course for three quarters, providing an analysis of fabrics. Advanced pattern drafting. Study and analysis of fibers. Advanced techniques of weaving, with related problems in design. Continued experience in sample warps and yardage weaving. Practice in the use of various types of eight- to 10-harness looms. Experiments and research with novelty fibers. Independent study, papers, reports.

Lab. 15, Credit 5

FSCT-351, 352, 353 Textile Craft Elective II
Registration #0413-351, -352, -353
An elective course providing an opportunity for more advanced study in textiles.

Lab. 6, Credit 3

FSCT-400 Textile Materials and Processes
Registration #0413-400
Sequential course for three quarters, providing an analysis of new developments in fabrics both handwoven and power-loomed and their appropriate use. The design of fabrics within specific price ranges, and for specific uses. Independent study, papers, reports.

Lab. 15, Credit 5

FSCT-500 Textile Techniques and Thesis
Registration #0413-500
Sequential course for three quarters, covering the design of fabrics in selected fields such as household fabrics, fashion fabrics or accessories with concentration on items having production merit. A thesis is included.

Lab. 24, Credit 8

FSCW-200 Woodworking Materials
Registration #0414-200 and Processes
Sequential course for three quarters, covering function and care of hand and machine woodworking tools. Wood as a material: history, kinds, qualities, sources. Fundamental techniques of wood fabrication, including basic joinery, turning, and finishing.

Lab. 15, Credit 5

FSCW-251, 252, 253 Wood Craft Elective I
Registration #0414-251, -252, -253
An elementary course in design and techniques in woodworking.

Lab. 6, Credit 3

FSCW-300 Woodworking Materials
Registration #0414-300 and Processes
Sequential course for three quarters, covering advanced design, layout and construction. Advanced veneering and finishing. Estimating and production techniques. Flexibility of machine tools, use of jigs and templates and studies of small shop capacity and layout. Historical development of furniture and interiors. Independent study, papers, reports.

Lab. 15, Credit 5

FSCW-351, 352, 353 Wood Craft Elective II
Registration #0414-351, -352, -353
An elective course providing an opportunity for more advanced study in wood.

Lab. 6, Credit 3

FSCW-400 Woodworking Materials
Registration #0414-400 and Processes
Sequential course for three quarters, covering advanced construction in veneering, involving at least one marquetry project. Alternative methods of joinery and the flexible use of equipment. Analysis of construction problems in both traditional and contemporary furniture, requiring student research in comparative construction methods. Independent study, papers, reports.

Lab. 15, Credit 5

FSCW-500 Woodworking Techniques
Registration #0414-500 and Thesis
Sequential course for three quarters, allowing each student, with the approval of the instructors, either to specialize in one branch of woodworking or to develop a particular design trend. This culminates during the final quarter in the completion of a thesis project.

Lab. 24, Credit 8

Graduate Courses, Fine and Applied Arts

Courses for the education concentration of the MST program are offered through the College of General Studies, and course descriptions are given under that heading with a GS call number.

Art Education

FADA-701, 702 **Methods and Materials**
Registration #0401-701, -702
Intensive study of curriculum in terms of teaching materials for both studio and appreciation aspects of elementary, early secondary and high school art education. Includes studio and elementary school teaching experience.

Class 2, Lab. 9, Credit 5

FADA-820 **Seminar in Art Education**
Registration #0401-820
Evaluation and study of the practice teaching experience. Discussion of the professional role of the art teacher in terms of professional associations, supervision, teacher training, and research. A final project on some intensively studied aspect of art education is required.

Lab. 25, Credit 3

FADA-860 **Practice Teaching in Art**
Registration #0401-860
A seven-week full-time practice teaching experience in secondary school, including professional duties of the art teacher in humanities courses, publication advising, audiovisual work, and supervision. Supplements the studio-theoretical education. Meets the state education requirements.

Credit 9

Communication Design

FADC-780 (MFA) **Communication Design Studio**
Registration #0402-780

FADC-750 (MST)
Registration #0402-750
Advanced creative problem solving experiences in communication design imagery. Professional problems in graphic design and related visual techniques for communication media such as print, television, film. Media Center facility available for extension of studio problems.

Lab. 9-27, Credit 3-9

Environmental Design

FADE-780 (MFA) **Design Applications**
Registration #0403-780

FADE-750 (MST)
Registration #0403-750
The reasoned application of theoretical three-dimensional design, to responsible, practical solutions that are valid in our complex and dynamic world environment, by considering the importance of the decision making role of the individual designer in a mass industrialized society.

Lab. 9-27, Credit 3-9

Painting

FADP-780 (MFA) **Painting**
Registration #0405-780

FADP-750 (MST)
Registration #0405-750
The pursuit of the pertinent, the ecstatic, the beautiful, by a small group of those dedicated to the art.

Lab. 9-27, Credit 3-9

Printmaking

FADR-780 (MFA) **Printmaking**
Registration #0406-780

FADR-750 (MST)
Registration #0406-750
Advanced techniques in etching, lithography and woodcutting, as well as in many experimental areas including color processes, photo-etching, photo-lithography, vacuum-forming, combination printing and calligraphy. Students are expected to develop along independent lines, and direction is offered in contemporary thought and concept. The emphasis is toward developing a complete respect for the printmaking craft and profession.

Lab. 9-27, Credit 3-9

Thesis

FAD(C, E, P, or R)-890 **Research and Thesis**
Registration #040(2, 3, 5 or 6)-890 **Guidance**
The development of a thesis project instigated by the student and approved by a faculty committee and the Graduate Faculty Chairperson. Primarily creative production, the thesis must also include a written report.

Credit 12

School for American Craftsmen Design, Techniques and Research Problems

A program structured on the basis of individual needs, interests, and background as they may be determined through faculty counseling. This sequence of courses will lead to the production of a thesis project, suggested by the student and approved by the faculty. This applies to all craft areas.

FSCC-780 (MFA) **Ceramics and**
Registration #0409-780 **Ceramic Sculpture**

FSCC-750 (MST)
Registration #0409-750

FSCG-780 (MFA) **Glass**
Registration #0411-780

FSCG-750 (MST)
Registration #0411-750

FSCM-780 (MFA) **Metalcrafts and Jewelry**
Registration #0412-780

FSCM-750 (MST)
Registration #0412-750

FSCT-780 (MFA) **Weaving and Textile Design**
Registration #0413-780

FSCT-750 (MST)
Registration #0413-750

FSCW-780 (MFA) **Woodworking and Furniture**
Registration #0414-780 **Design**

FSCW-750 (MST)
Registration #0414-750

Lab. 9-27, Credit 3-9

FSC(C, G, M, T or W)-890 **Research and Thesis**
Registration #040(9, 11, 12,13 or 14)-890 **Guidance**
Research and presentation of an acceptable thesis with a focus on technique, design, production, or a combination of these approved by the faculty. The thesis subject will be chosen by the candidates with the approval of the faculty advisor. The thesis will include a written summation or report of the research and presentation program.

Lab. 27, Credit 12

College of General Studies

Criminal Justice

GCJC-201 Fundamentals of the Criminal Justice System
Registration #0501-201
The principles of the criminal justice system; administration and management within various agencies, including the relationship of the police to the courts; the courts to the probation, correction and parole functions.
Consideration will also be given to specific problems within the branches of the criminal justice system.

Class 3, Credit 4

GCJC-203 Criminology
Registration #0501-203
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.

Class 3, Credit 4

GCJC-204 Introduction to Public
Registration #0501-204 Administration
This course presents the principles of management and organizational theory as they relate to public agencies in general, and criminal justice agencies in particular. Case studies, as well as descriptive information concerning the classic issues involved in the administering of public institutions, will be offered to the student. (GCJC-201)

Class 3, Credit 4

GCJC-206 Administrative Concepts In Law Enforcement
Registration #0501-206
The course is intended to provide the student with an overview of the fundamental concepts of organization and administration, and to provide also the criteria and/or standards by which municipal police agencies may be evaluated or improved administratively. (GCJC-203)

Class 3, Credit 4

GCJC-207 Corrections
Registration #0501-207
The course is designed to introduce the student to the basic organizations of the correctional system, their functions and performance. Prisons and jails, as well as probation and parole agencies, will be discussed within the context of historical and contemporary philosophy. Attention will also be 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 will be surveyed. (GCJC-201)

Class 3, Credit 4

GCJC-301 Fundamental Concepts of
Registration #0501-301 Criminal Law
The subject matter of this course consists of an introduction to the fundamental principles upon which substantive criminal law is based. The basic characteristics and requirements of criminal conduct are examined. Included in the scope of this course are the following topics: the nature of criminal conduct, the meaning of criminal mental state, the requirement of concurrence between action and intent, and the requirement of legal causation. The elements of the principal defenses to criminal liability, such as insanity, entrapment, and self-defense, are also discussed. (GCJC-201)

Class 3, Credit 4

GCJC-302 History of Organized Crime
Registration #0501-302 In America
Historical analysis of criminal associations in their various manifestations, informal types of cliques and mobs and formal organizations of industry and area-wide rackets; with special emphasis upon organized crime as it developed historically in America. (BCJC-201, 203)

Class 3, Credit 4

GCJC-303 Law Enforcement In Society:
Registration #0501-303 The Police Function
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 the community, police organization and community control mechanisms. (GCJC-201)

Class 3, Credit 4

GCJC-304 The Judicial Process
Registration #0501-304
This course is designed to provide the student with a fundamental understanding of the various procedural steps involved from the time a person is charged with a criminal offense up to the time of sentencing. This course examines both federal and state criminal judicial systems, their functions and operations, their similarities and differences, and their impact upon the accused and the victim. (GCJC-201)

Class 3, Credit 4

GCJC-306 Introduction to
Registration #0501-306 Para-Legals
The course deals with criminal and civil law, matrimonial law, legal research, counseling, problem solving techniques, and lawyers' ethics as well as a study of community resources available to assist the client. (GCJC-201)

Class 3, Credit 4

GCJC-307 Criminal Investigation
Registration #0501-307
The course is an introduction to the criminal investigative function and process which would include the history and theory of criminal investigation, crime scene searches, collection and presentation of physical evidence, the obtaining of testimony and confessions, scientific laboratory methods and the admissibility of evidence in a court of law. (GCJC-303)

Class 3, Credit 4

GCJC-309 Juvenile Justice
Registration #0501-309
The philosophical, historical and operational aspects of the juvenile justice system; evaluation of the social and personal factors related to juvenile delinquency; the role of police, the courts, corrections and community programs in delinquency prevention, control and treatment. (GCJC-201)

Class 3, Credit 4

GCJC-401 Scientific Methodology
Registration #0501-401
A survey and analysis of the uses of statistics and social research methods, with special reference to utilization of data from the field of criminal justice. The first part examines the basic techniques in social research. Attention is given to methods of collecting, analyzing and interpreting statistical data, and to the use of statistics in the development of research designs; the second part of the course covers descriptive statistics, as well as discussion of the probabilistic nature of all such systems and the elements of data evaluation employed.

Class 3, Credit 4

GCJC-403, GCJC-404 Field Experience (2)
Registration #0501-403, #0501-404
Under the guidance of an instructor, during the junior or senior year, the student is placed in a participating criminal justice agency in order that he or she may gain firsthand experience with its organization, programs, and methods of work. Closely supervised work at the agency is supplemented by communication with the student's field placement instructor to discuss experiences encountered on the job.

Class variable, Credit 9 each

GCJC-405 Major Issues In the
Registration #0501-405 Criminal Justice System
This course is designed as an advanced seminar which will focus on contemporary issues and topics not otherwise distinctly incorporated in established criminal justice courses. As a seminar the course will concentrate on student discussion and interaction surrounding required readings on topics such as political/official deviance, crime in the streets, issues in the prosecution/court system, deterrence, and female criminality. Topics may vary from offering to offering.

Class 3, Credit 4

GCJC-407 Behavior Modification in Corrections
Registration #0501-407
A course surveying present and future methods of modifying human behavior with a goal of individual change. Included will be a survey of control technologies, utilized and proposed as methods of individual behavior modification. Discussion will center on technique, as well as social and ethical implications. Emphasis will be on utilization oriented models. (GCJC-201, 207)

Class 3, Credit 4

GCJC-408 Constitutional Law and
Registration #0501-408 Criminal Justice
This course has been designed to provide the student with a basic understanding of the constitutional principles frequently encountered in the criminal justice profession. Landmark court decisions, relating to due process, equal protection, unlawful arrest, unreasonable search and seizure, compulsory self-incrimination, the assignment of counsel and fair trial guarantees are discussed and critically evaluated. (GCJC-201, 301)

Class 3, Credit 4

GCJC-409 Legal Rights of Convicted Offenders
Registration #0501-409
This course is designed to present an in-depth study of the 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 post-conviction remedies. The course is 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, which deals with convicted offenders, may find this course useful. (GCJC-201, 207)

Class 3, Credit 4

GCJC-410 Correctional Administration
Registration #0501-410
This course presents the history and development of the principles of management and organizational theory as they developed in the field of corrections. This developmental evaluation is followed by a presentation of certain principles and philosophies concerning agency administration which have proved effective in business, industry, and many elements of government, with the intention of discussing their applicability to prisons, probation, parole, and other community correctional programs. (GCJC-201, 207)

Class 3, Credit 4

GCJC-411 Issues in Corrections
Registration #0501-411
This course is a sequel to Fundamentals of Corrections. It presents a critical evaluation of the contemporary correctional programs in the United States. Programs discussed include: jails, prisons, probation, parole, half-way houses, study release, work release, prison furloughs and various community-based correctional techniques. Emphasis is placed upon the theories of penology and rehabilitation, which provide direction to the correction system today, and the theoretical positions which may affect the future of corrections. (GCJC-201, 207)

Class 3, Credit 4

GCJC-412 Social Control of Deviant Behavior
Registration #0501-412
Designed as a professional elective for criminal justice majors interested in studying the major theories explaining the phenomena of deviance; how it is created and labeled through the process of definition and social sanction. Emphasis will be on that type of behavior which elicits societal response in the form of criminal or civil action and on deviance from the perspective of the deviant who may be placed under some form of legalized social control. (GCJC-201, 203)

Class 3, Credit 4

GCJC-413 Civil Disobedience and
Registration #0501-413 Criminal Justice
A survey of the philosophy and history of civil disobedience, civil disobedience as a political tactic, differentiation between civil disobedience and “ordinary crime," civil disobedience and "non-criminals,” civil disobedience within the criminal justice system, and the role of riot commissions. (GCJC-201, 203)

Class 3, Credit 4

GCJC-505 White Collar Crime
Registration #0501-505
An examination of the extent and character of white collar crime, with special emphasis upon political and financial variables and differentiating conditions. (GCJC-201, 203)

Class 3, Credit 4

GCJC-506 Evidence
Registration #0501-506
This course is designed to provide the student with an awareness of what types of evidence are admissible in a criminal trial. The course 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. The course 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. (GCJC-201)

Class 3, Credit 4

GCJC-510 Counseling in the
Registration #0501-510 Criminal Justice System
This course is designed to instruct the student in the various, accepted contemporary dynamics of interviewing and counseling generic to criminal justice and related human service agencies. Issues to be discussed will revolve around counseling and supervision strategies and conflicts among agencies, between administrators and staff, and between staff and clients. This course will present both the practical and theoretical aspects of these issues as well as devote attention to surveying prospective counseling strategies for accomplishing desired behavioral change. (GCJC-201)

Class 3, Credit 4

GCJC-511 Alternatives to Incarceration
Registration #0501-511
The course analyzes possible sentencing options available to the criminal court as well as pre-adjudicatory alternatives for both adults and juvenile offenders. The variety of dispositions evaluated include: Probation, Parole, Half-way houses, Work-release, study-release, prison furloughs, pre-trial release, pre-p>obation alternatives (fines, suspended sentences, conditional discharge, and a variety of diversion programs). Special emphasis is placed on a critical evaluation of the alternatives as they compare to the more traditional methods of handling offenders. Field trips and guest lecturers from non-traditional programs are typically included in the course.

Class 3, Credit 4

GCJC-512 Minority Groups and the
Registration #0501-512 Criminal Justice System
The course will examine the role traditionally attributed to the members of minority groups as criminals and analyze their interaction with the criminal justice system. Heavily relying on the conflict perspective, the course will review the literature on the creation of laws, the breaking of laws, and the processing of minority members in the criminal justice system. (GCJC-201, 203)

Class 3, Credit 4

GCJC-514 Planning and Change in the
Registration #0501-514 Criminal Justice System
It is the objective of this offering to expose the student to issues of "change" within the criminal justice system. Police, courts and corrections will be discussed, in view of current and proposed changes. The planning of change will be emphasized with regard to both organizational and individual issues. In addition, attention will be given to surveying various strategies for accomplishing change, his course is designed to give the advanced student the opportunity to intensely scrutinize the prospective shape of the criminal justice system. (GCJC-203)

Class 3, Credit 4

GCJC-516 Family Court Administration
Registration #0501-516
A course designed to explore the management aspects of the court and court process. There is a focus on the structure of the several levels of court that typically exist in modern urban America. Related to this structure are the various other criminal justice agencies that interact with the court at various stages of the process. In addition, operational problems, such as the bail process, record keeping, jury service and selection methods, and calendar management will receive significant attention. i

Class 3, Credit 4

GCJC-517 Comparative Criminal Law
Registration #0501-517
The course examines, in a comparative analysis, the criminal systems and the penal methods of Europe and tfie United States. Major emphasis will be given to the issues of intent, criminal responsibility, individual and public interests, purposes and modes of prevention, repression and punishment, methods of trial, punishment and pardon. (GCJC-201)

Class 3, Credit 4

GCJC-518 Police/Community Relations
Registration #0501-518
Police-public contact; uses of the communications media in projecting the police image; responsibilities of police in dealing effectively with minority groups, civil rights, civil disorder, and public protection. An exploration of the role and function of the police in intergroup relations. (GCJC-303)

Class 3, Credit 4

GCJC-520 Law and Discretion in Criminal Sentencing
Registration #0501-520
This course is intended to provide the student with a broad overview of the law of sentencing and the alternatives presently available in this area. Emphasis will be placed on the traditional methods of punishment now available in the courts, including, but not necessarily restricted to; fines, imprisonment, probation and suspended sentences. The course will also look to the power of the court in exercising its discretion in the sentencing process. (GCJC-201,207, 304)

Class 3, Credit 4

GCJC-522 Victimless Crime
Registration #0501-522 and the Law
The course is designed to familiarize the student with many of the implications and ramifications of efforts to control "victimless" crimes. Course discussions concentrate on the illegal activity associated with prostitution, gambling, homosexuality, drug use and pornography. In this course the social, political, moral, legal and practical consequences of legalizing such activities are examined and evaluated. (GCJC-201, 203, 301)

Class 3, Credit 4

GCJC-523 Crime and Violence
Registration #0501-523
The course will analyze the causes of the outbreak and rapid increase of violent and criminal trends in the world as the most serious realities of the 20th century. Primarily, emphasis will be given to the interdependence between socioeconomic instability and crime, underdevelopment and crime, urban crisis and social mobility, unequal opportunities and racial strife. The course will transcend the national boundaries of America and will focus on crime, violence, and urban crisis in other parts of the world. The course will be a comparative study of America's and the world's problems of violence, crime and urban crisis. (GCJC-201)

Class 3, Credit 4

GCJC-525 Industrial Security
Registration #0501-525
Analysis of the major problems of industrial and business security, including college campuses, hospitals, etc. Emphasis on current security problems and methods of dealing with them effectively. Administrative, legal and technical problems will also be discussed. (GCJC-201)

Class 3, Credit 4

GCJC-526 Issues In Law Enforcement
Registration #0501-526
A critical analysis of some of the current issues, problems and concerns in the area of law enforcement; emphasis on basic police function as it relates to the courts, corrections and the community. Conflicts between theory and practice are examined and analyzed, and future trends in law enforcement will be explored. (GCJC-303)

Class 3, Credit 4

GCJC-527 Advanced Criminal Law
Registration #0501-527
The course will investigate assumptions and concepts of criminal law. The course will emphasize major crimes against the person and major crimes relating to property. (GCJC-201, 203, 301)

Class 3, Credit 4

GCJC-528 Etiology of Crime
Registration #0501-528
This course is a comprehensive survey of the sociological, pyschological, and psychiatric views of the etiology of crime and other forms of deviant behavior. With major emphasis on the sociological forms of explanation, the course will undertake a historical review of criminality theory and progress to present-day concerns of both etiological and epidemiological origins. (GCJC-201, 203)

Class 3, Credit 4

GCJC-529 Physical Security
Registration #0501-529
This course will include an analysis of today's cost of crime against business, and the methodology utilized in creating such losses. Primary course emphasis will be placed upon methods, techniques, and approaches used in the professional field of loss prevention/ security administration to provide the widest range of practical solutions in the reduction of losses and the enhancement of security as a tool of management. (GCJC-201)

Class 3, Credit 4

GCJC-599 Independent Study
Registration #0501-599
A combined student/faculty member effort on a chosen topic beyond the norma! sequence of course selections. It provides the qualified self-motivated student, with a creative orientation, the opportunity to develop an autonomous and personal sense of academic growth and achievement.

Class variable, Credit variable

Social Work

GSWS-210 Introduction to the Field of Social Work
Registration #0516-210
Designed to introduce various aspects of the social work profession. To give the student basic knowledge of major social welfare programs, such as public assistance. To sensitize students to people's needs, especially the needs of members of society who differ from themselves and to begin building social work attitudes of objectivity, inquiry, empathy and non-judgement.

Class 3, Credit 4

GSWS-211 Social Work Field Study
Registration #0516-211
Designed to introduce the student to the social work community and a wide spectrum of agencies. Class sessions will be scheduled once a week for a block of three hours, and will be taught entirely off campus. It illustrates social work in practice, not in theory. (GSWS-210 or concurrent)

Class 3, Credit 2

GSWS-302 Social Welfare: History
Registration #0516-302
Designed to explore social welfare institutions and processes along with their history and philosophy and their relationship to other social institutions in the United States. Emphasis is on the role of social work in various interrelated social welfare institutions.

Focus is on the gradual modification of social policy in order to provide the student with a basic understanding of the evolution of programs and services to meet the changing needs of people. The development of the social work profession is traced along with its response to the changing needs of our society. (GSWS-210 or concurrent)

Class 3, Credit 4

GSWS-310 Hispanic Culture for Social Workers
Registration #0516-310
This course, designed with a social work emphasis, will attempt to objectively portray the life of both Mexican-Americans and Puerto Ricans and other Spanish speaking groups and the problems of assimilation into a predominantly Anglo society. (GSW0-210)

Class 3, Credit 4

GSWS-311 Social Work from a Pan-Afrikan Perspective
Registration #0516-311
This course is designed to analyze past, present and future social welfare policies, programs and practices from a Pan-Afrikan perspective. This perspective is viewed as essential if one is to attain skills needed to analyze programs and policies from their actual effects and predictable effects on black people. (GSWS-210)

Class 3, Credit 4

GSWS-312 Research Methods
Registration #0516-312
Introduction to the methodology of research in behavioral and social sciences. Stress will be on the use of theoretical concepts formulation of hypotheses, collection of data, measurements, statistics, tests, and evidence evaluation. Instruction and practical demonstration is provided in techniques ranging from simple case studies to computer utilization. (GSWS-210)

Class 3, Credit 4

GSWS-411 Methods of Social Work I and
Registration #0516-411 Laboratory
See GSWS-413 (GSWS-210, 211 or concurrent, 302)

Class 4, Credit 4

GSWS-412 Methods of Social Work II
Registration #0516-412
See GSWS-413 (GSWS-411, concurrent with GSWS-421)

Class 3, Credit 4

GSWS-413 Methods of Social Work III
Registration #0516-413
Methods of Social Work is a three course sequence offered concurrently with laboratory or field experience. Methods of Social Work stresses the basic principles and skills of a generic approach to social work practice, emphasizing the differential use of social work techniques and Interventive skills in a variety of client systems.

Through lectures, discussions, readings, lab simulations and case analysis, it is the overall objective of the sequence to provide the student with the knowledge, skill and self-awareness for beginning professional social work practice. The development of this knowledge, skill and awareness is seen as a progressive process underlying and underpinning the three-course sequence (GSWS-412,421, concurrent with GSWS-422)

Class 3, Credit 4

GSWS-421 Field Instruction I and Seminar
Registration #0516-421
See GSWS-422 (GSWS-411. Concurrent with GSWS-412)

GSWS-422 Field Instruction II and Seminar
Registration #0516-422
A twenty-week, 30 hr./week supervised field placement. Under the guidance of an instructor, the student is placed in a cooperating social, governmental, or education agency in order that he or she may gain first-hand experience with its organization, programs, and client assignments. Closely supervised work at the agency is supplemented by consultations with the instructor in a seminar designed to integrate theory and practice. (GSWS-412, 421, concurrent with GSWS 413)

Credit 5/Qtr.

GSWS-532 Social Welfare: Profession and Issues
Registration #0516-532
Examines the profession of social work. It will look at the values in social work practice, as stated in the Code of Ethics. Current practice issues of the profession will be studied and discussed. Maintenance issues of the profession such as licensure, third party payments and other topics will also be examined. (GSWS-413, 422)

Class 3, Credit 4

GSWS-533 Social Welfare: Organization
Registration #0516-533 and Systems
An in-depth study of the organization of social welfare services. To include: analysis of agency structure, i.e., board, staff, budget, client needs and services; policy-making processes; the pyramiding of agencies into umbrella systems; power groups, vested interests and coalitions. The role and function of the social worker in this milieu will be explored.S(GSWS-413, 422)

Class 3, Credit 4

GSWS-535 Seminar and Project
Registration #0516-535
For social work students who have completed field experience. The seminar is directly related to the projects that students are working on, and consists of weekly presentations developed around individual student's needs for help and supervision. Students will present current data on their projects' progress, as well as participate in a helping process with other class members. (GSWS-312,413,422)

Class 3, Credit 4

Social Work Electives

GSWS-212 Self-Awareness In the Helping Role
Registration #0516-212
This course helps to develop students' helping skills in essentially three broad areas:

1. Skills in noticing or observing.
2. Observing one's professional use of self in the helping relationship and evaluating the appropriateness of such behavior.
3. Observing the client and evaluating the effect one's response has on him/her.

Students are expected and required to increase their awareness skills and this course offers a unified learning experience where students can concentrate on the theory and practice of awareness skills. (GSWS-210, concurrent with or before GSWS-411)

Class 3, Credit 4

GSWS-213 Gerontology
Registration #0516-213
An introductory study of the second half of the life span with a design to increase understanding of the processes of social accommodation, socialization and social change of the aged as they interact with the community and others. (Introduction to Psychology)

Class 3, Credit 4

GSWS-214 Drug Abuse
Registration #0516-214
This course is designed to familiarize the social work student with the many varieties of dry drugs, drug abuse, drugs and the social scene. Emphasis is placed on a variety of treatment modalities to be used by the social worker when working with drug abusers.

Class 3, Credit 4

GSWS-320 Alcoholism Disability:
Registration #0516-320 Physiology and Psychology
This course presents the chemistry of ethanol, methanol and alcohol and their effects on the body and mind as well as signs, symptoms, addiction and withdrawal. The study of normal and abnormal personality development in the adolescent and later years and the psychological mechanisms lending support to alcohol use in our society is emphasized.

Class 3, Credit 4

GSWS-321 Alcoholism: Interventive Skills and Techniques
Registration #0516-321
Teaches a variety of Interventive skills to those giving care to alcoholics, their families, and communities. Emphasis is placed upon the method of use of these skills. Role play, video tape and case study will be included. (Second year standing)

Class 3, Credit 4

GSWS-322 Alcoholism: Rehabilitation Modalities
Registration #0516-322 and Community Resources
The course analyzes psychological symptoms and diagnosis of the alcoholic and current methods of rehabilitation. Explores structure, function and use of community resources. (Second year standing)

Class 3, Credit 4

GSWS-323 Alcoholism—Supervision in an Alcoholism Setting
Registration #0516-323
Presentation of current supervisory methods and principles with emphasis on their use in agencies serving the alcohol abuser. (Second year standing)

Class 3, Credit 4

GSWS-330 Rural Social Services
Registration #0516-330
The course will identify the historical development, cultural make-up, family life styles and work habits of the nation's migrant population. The historical development, cultural make-up, family life styles and work habits of the nation's rural-poor will also be identified. The course will examine and critically analyze the differences between the migrants and the rural poor and compare them to the characteristics of the urban poor found in contemporary American cities. The manner by which governmental policies and service-delivery systems directed to the rural areas reflect the economic, political, and social conditions during which they are developed will be subjects of concern. The skills of generic rural social work, vis-a-vis, urban social techniques will also be discussed.

Class 3, Credit 4

GSWS-357 Mental Health & Mental Illness from a
Registration #0516-357 Social Work Perspective
This course is designed to give social work students a basic understanding of mental health, mental illness and mental retardation from a social work perspective. The role of the social worker in working with mentally retarded individuals and their families will be included. Students will also be given a general understanding of our current mental hygiene systems. (0514-210)

Class 3, Credit 4

GSWS-313 Women in the Social Work System
Registration #0516-313
This course is designed to sensitize social work students to the specific Concerns of women as a minority group. The course will focus on a woman's cultural upbringing and specific problems and issues related to the worker-client relationship. The student who completes this course will have a better general understanding of the status of women in our society, and a particular awareness of the position of women as workers and clients in the social welfare system.

Class 3, Credit 4

GSWS-314 The Social Worker as Advocate
Registration #0516-314
This course will examine the role of social workers in advocating with and on behalf of clients and others in their efforts to negotiate or bring about needed change in institutions or policies of our society. Discussion of the forces in the social, economic and political environment today which directly affect poverty, racism and related urban crises will be related to examining techniques for achieving change.

Class 3, Credit 4

GSWS-509 Services to Children and Their
Registration #0516-509 Families
This course is designed to give social work students a beginning knowledge of social work services to children and their families. The development of each type of service will be discussed as well as the reasons why each service is needed and for what type of situation. The social worker's role in each area will also be considered. (GSWS-413, 422)

Class 3, Credit 4

GSWS-510 Current Treatment Modalities
Registration #0516-510
A course focusing upon current advanced treatment modalities. To include behavior modification, transactional analysis, parent effectiveness training, Gestalt and reality therapy. Other modalities will be considered. (GSWS-413, 422)

Class 3, Credit 4

GSWS-512 Intervention with Individuals
Registration #0516-512
This course builds upon the methods sequence knowledge base and develops the students' understanding of the specific ways in which these concepts and theories are applied in social casework intervention with individuals and families. Use will be made of case studies, and role play situations to further develop the students' skills in this area. (GSWS-413, 422)

Class 3, Credit 4

GSWS-522 Intervention in Communities
Registration #0516-522
This course examines community intervention as a social work method. Methods of assessing needs, the roles and functions of the community intervention practitioner and alternative models of practice are analyzed. The course will investigate specific applications of community intervention theory to political influence processes, coalition, neighborhood associations, and regionalization. (GSWS-413, GSWS-422)

Class 3, Credit 4

GSWS-532 Intervention with Groups
Registration #0516-532
This course examines social treatment as one form of group work practice. There are different service procedures and approaches which center on the use of client groups, and each may have utility in pursuing distinct service objectives. The course will investigate the scope, techniques and function of the group work concept as practiced in such diverse settings as social service agencies, business, correctional institutions and communities. (GSWS-413, GSWS-422)

Class 3, Credit 4

GSWS-599 Independent Study
Registration #0516-599
A combined student/faculty member effort on a chosen topic beyond the normal sequence of course selections. It provides the self-motivated student, with a creative orientation, the opportunity to develop an autonomous and personal sense of academic growth and achievement. Independent Study may include independent work in an agency setting.

Class variable, Credit variable

The following courses are offered by the College of Continuing Education but may be taken as electives by students enrolled in the Social Work program.

CGES-401 Psycho-Social Aspects of Deafness
Registration #0227-401
This course provides a broad overview of the effects of deafness on individuals, its relation to their social and intellectual development, and an appreciation of the hearing impaired as a person. It provides basic information regarding the nature of sound, anatomy of hearing, and the causes and types of deafness.

Class 3, Credit 4

CSWS-470 **Growth and Development of the Pre-School Child**
Registration #0233-470
The course seeks to examine the basic factors contributing to the growth and development of the pre-school child. Emphasis is put on those factors leading to personality development as described by Freud and Erikson, behavioral patterns as described by S-R theory, and those factors leading to the development of "intelligence" and creativity.

Class 3, Credit 4

CSWS-471 **Day Care Programming**
Registration #0233-471
Essential to the total development of the child are the activities provided to stimulate that development. The course is so designed that newcomers as well as those having worked in child care can appreciate the interrelationships between the various disciplines and developmental tasks. The element of proper planning is introduced.

Class 3, Credit 4

CSWS-472 **Day Care—Materials and the Classroom**
Registration #0233-472
Participants will be given instruction in the use of a variety of program materials and skills to meet the needs of the day care child. Included will be use of dramatics, dance, crafts, arts, music, rhythm, paper bag activities, etc. In addition, creative use of audiovisual equipment will be taught and community resources will be identified.

Class 3, Credit 4

CSWS-473 **Day Care—The Emerging Profession**
Registration #0233-473
This course will explore various aspects of the emerging profession of day care with specific emphasis on history and development, philosophy, roles of various staff members—teacher, teacher aides, supervisor, administrator, board of directors—and their relationship with one another. In addition, the course will explore working with the family, community relationships, referrals, community resources, and the development of goals and objectives in day care programming.

Class 3, Credit 4

CSWS-554 **Supervision**
Registration #0233-554
This course identifies and teaches the supervisory skills required in social work and related agencies. Different methods and techniques are explored. Role play and video tape are used. (CSWS-413, 422)

Class 3, Credit 4

General Studies courses

Language and Literature

GLLC-220 **English Composition**
Registration #0502-220
This required course is to be taken in the lower division, preferably in the freshman year. The purpose of the course is to develop certain language skills needed to write effectively. The specific objectives of the course are the following: to teach students the basic skills required for the discovery, selection, and arrangement of ideas and the expression of such ideas in a manner appropriate to the purpose and audience for writing: to familiarize students with the uses of a library; to acquaint students with the purposes and procedures of documentation; to teach students the skills of accurate proofreading and critical reading of their own prose; to emphasize the necessity for the basic conventions of grammar, usage, spelling, and punctuation; to emphasize critical reading and thinking as essential components of good writing.

Class 3, Credit 4

GLLC-421, 422 **German I, II**
Registration #0502-421, -422
The courses are designed to enable the student to read and understand technical and scientific German.

Class 3, Credit 5/Qtr.

GLLC-501 **Effective Speaking**
Registration #0502-501
The development of the techniques of oral communications as an aid to self-confidence in modern social and business situations. Weekly practice talks with emphasis on organization, clarity, vocal expression, poise, interest, and appropriateness.

Class 3, Credit 5

GLLC-511 **Modern Applications of Language Theory**
Registration #0502-511
The history and theory of communication from basic human communication through the mass media extensional systems.

Class 3, Credit 5

GLLC-314 **Mass Communication**
Registration #0502-514
Content will cover the theoretical and practical aspects of the mass media with particular emphasis on the relationship between government, the media, and the public.

Class 3, Credit 5

GLLC-515 **Uses and Effects of the Mass Media**
Registration #0502-515
An analysis of the “effects” and the “uses and g ratifications” of mass communication research with focus on building mass communication theory. (Note: Students may find GLLC-514 a useful introduction to this course).

Class 3, Credit 5

GLLC-518 **Advanced Creative Writing**
Registration #0502-518
Students are given maximum freedom to write what they are concerned with in as wide a range of genres as they will attempt.

Class 3, Credit 5

GLLC-520 **Vocabulary Building**
Registration #0502-520
Application to the process of vocabulary building of the various disciplines of language study will be provided. Included among these will be applications of dictionary study, etymology, semantics, and structural linguistics. In addition, literary works, periodicals, and newspapers will be examined to strengthen the student’s awareness of the contextual variation in the meaning of words. Ineffective and faulty devices of language usage will also be discussed.

Class 3, Credit 5

GLLC-547 **Practical Writing**
Registration #0502-547
An intensive review of basic expository writing skills with emphasis on regular writing assignments. Class periods will be devoted chiefly to analysis and evaluation by students of their essays. The aim of the course is to enable the student to write unified, coherent essays with reasonable ease and accuracy.

Class 3, Credit 5

GLLC-533 **Creative Interpretation in Sign**
Registration #0502-533
Creative approaches to the interpretation of selected literary classics (prose, poetry, fiction, drama) through the visual medium of sign (sign language and sign-mime).

Class 3, Credit 5

Note: The following Lower Division Literature courses (GLLL-320—336) enrich the student’s self-understanding and cultural awareness through the study of our literary heritage. Readings will be drawn from the great works of the Ancient World, the Medieval-Renaissance period, and modern times. Literary types will include drama, poetry, and prose fiction. The works will be studied in their historical context as well as for aesthetic and intellectual enrichment.

GLLL-320 **Literature and Myth**
Registration #0504-320
A study of the uses of myth in literature, emphasizing a selected group of commonly accepted archetypes and motifs which appear in a variety of literary forms.

Class 3, Credit 4

GLLL-324 Guilt and Expiation
Registration #0504'-324
The course uses a survey approach of Western literature from the ancient world up through the 20th century dealing with the theme of man's sense of guilt and how he handles it.

Class 3, Credit 4

GLLL-325 Thematic Approach to Western Literature
Registration #0504-325
A survey of the major literary genre concerned with certain recurring thematic subjects—love, conflict, religion, evil, death, and the individual—which emphasizes plot, character, setting, style, and theme of respective works.

Class 3, Credit 4

GLLL-326 Literature In Its Critical Perspectives
Registration #0504-326
An analysis of short stories, poems, plays, and the novel from various critical perspectives.

Class 3, Credit 4

GLLL-328 Modern Criticism of Literature
Registration #0504-328
Critical approaches to literature to provide the student with a standard of judgment in literature.

Class 3, Credit 4

GLLL-330 Voyage Literature
Registration #0504-330
The treatment of the voyage in literature from Homer to the present.

Class 3, Credit 4

GLLL-331 Genres of World Literature
Registration #0504-331
Survey of the primary genres of world literature: drama, novel, short story and poetry.

Class 3, Credit 4

GLLL-332 Survey of Western Literature
Registration #0504-332
A chronological survey of the masterpieces of Western literature from the epic of Homer to selected works of 20th century American and European writers.

Class 3, Credit 4

GLLL-334 Studies in the American Novel
Registration #0504-334
A study of selected American novels of the 19th and 20th centuries which have become literary classics.

Class 3, Credit 4

GLLL-335 The Hero in Literature
Registration #0504-335
This course is an introduction to the literature of Western civilization. It will trace the changing nature and treatment of the hero in literature from the time of ancient Greece to contemporary America.

Class 3, Credit 4

GLLL-336 Man and His Fictions
Registration #0504-336
The study of literature as one among the many fabrications of man which help him to define and come to terms with himself, time, the world, and other human beings in the world.

Class 3, Credit 4

GLLL-501 Speculative Fiction
Registration #0504-501
Speculative Fiction is a survey course in contemporary literature presenting conjectural views of man, his world, his society and his beliefs.

Class 3, Credit 5

GLLL-503 Great World Drama
Registration #0504-503
A chronological survey of the major periods of theatrical evolution, with emphasis on the physical theatre and production techniques which influenced the playwrights' works within the respective periods.

Class 3, Credit 5

GLLL-504 Shakespeare: Comedy and History
Registration #0504-504
Several of Shakespeare's comedy and history plays are read and analyzed to reveal their literary excellence and their theatrical power.

Class 3, Credit 5

GLLL-505 The American Spirit in Literature
Registration #0504-505
A survey of the development of American philosophy (political and social) through the study of selected works from the colonial period to the 19th century. Particular attention will be given to the ideas of the writers under consideration and their effect on modern American philosophy.

Class 3, Credit 5

GLLL-506 Literary Symbolism in Short Fiction
Registration #0504-506
Emphasis is on defining literary symbolism and in recognizing this device when it is employed in literary works, with special attention given to the accurate interpretation of symbolic works.

Class 3, Credit 5

GLLL-513 Ecological Awareness in Literature
Registration #0504-513
A chronological examination of selected works dealing with man's relationship to nature.

Class 3, Credit 5

GLLL-515 Contemporary American Novel
Registration #0504-515
The course will cover American fiction written after World War II. Works by contemporary American writers such as Ellison, Mailer, Bellow, and Updike will be examined, with special emphasis being placed on these writers' relation to contemporary American culture.

Class 3, Credit 5

GLLL-516 Literature and Society
Registration #0504-516
Selected works by writers such as Sophocles, Dante, Dickens, Camus and Vonnegut as important works of art that reflect the human condition and implicitly prophesy against particular evils in attitudes or institutions of their times.

Class 3, Credit 5

GLLL-517 Literature of the Bible
Registration #0504-517
A close and rapid reading of selected Old and New Testament books to show the range and variety of literary genres and styles in the Bible.

Class 3, Credit 5

GLLL-522 Mark Twain and the American Dream
Registration #0504-522
Focus will be on the bitter-comic writings of the last part of Twain's career and his various "escapisms."

Class 3, Credit 5

GLLL-524 Contemporary Film
Registration #0504-524
A study of contemporary world films, to be drawn from those presently showing in the Rochester area (theaters, television, film festivals). Emphasis will be on both technical and aesthetic aspects of the films.

Class 3, Credit 5

GLLL-527 Shakespeare: Tragedy and Romance
Registration #0504-527
A generous sample of Shakespeare's tragedy and romance plays is investigated to reveal their literary excellence and their theatrical power.

Class 3, Credit 5

GLLL-528 Great World Novels
Registration #0504-528
A careful reading and analysis of novels selected from the best examples of the genre. The novels are selected to exhibit a wide range of techniques of narration, methods of characterization, and approaches to plot construction.

Class 3, Credit 5

GLLL-529 Literature and Religious Experience
Registration #0504-529
An interdisciplinary course which attempts to explore the complexity and variety of man's personal religious quest and its conflicts as these are portrayed by psychologists and literary artists.

Class 3, Credit 5

GLLL-530 Religions of the East: Hinduism, Buddism
Registration #0504-530
A study of the major religions of the East.

Class 3, Credit 5

GLLL-531 American Literature of the 1920's and 1930's
Registration #0504-531
A study of American writers of the 20th century with particular attention to the beginnings of realism, naturalism and symbolism.

Class 3, Credit 5

GLLL-532 Man, Nature, and Technology
Registration #0504-532
The interdisciplinary ecology course; texts include Commoner, *The Closing Circle.*

Class 3, Credit 5

GLLL-533 The Modern Movement in Literature
Registration #0504-533
Examination of the philosophy and literary achievements of modernism through the works of Mann, Joyce, Proust, Beckett, Faulkner and Borges.

Class 3, Credit 5

GLLL-535 Technology and American Literature
Registration #0504-535
A study of 19th and 20th century short fiction and novels criticizing the impact of technology upon society.

Class 3, Credit 5

GLLL-536 Short Fiction
Registration #0504-536
The short story as a particular form of literature: definition, characteristics and aims.

Class 3, Credit 5

GLLL-538 The Nightmare of Technology: Studies in 19th Century British Writing
Registration #0504-538
Study of British prose and poetry on the effects of industrialism and the social problems in 19th century England.

Class 3, Credit 5

GLLL-539 The Romantic Vision
Registration #0504-539
A study of 19th century European prose and poetry (primarily British) with particular attention paid to the collapse of the Romantic vision, and its gradual absorption into the Aesthetic and Decadent literary traditions of late nineteenth century European literature.

Class 3, Credit 5

GLLL-540 Hero Image in the Theater
Registration #0504-540
An evolutionary survey of the image of the theatrical hero from Ancient Greece to the mid-20th century, with emphasis on the changes which take place in the hero image and the reasons for such character changes.

Class 3, Credit 5

GLLL-541 Literature and Cinematic Adaptation
Registration #0504-541
The analysis of both the literary and cinematic qualities and characteristics of common works, with emphasis on their similarities and differences and their resultant strengths and weaknesses as creative endeavors.

Class 3, Credit 5

GLLL-542 Literature of Violence
Registration #0504-542
An evaluation of the promoting forces, the types, and the effects of violence as ft occurs in literary themes from different periods and backgrounds.

Class 3, Credit 5

GLLL-545 Deaf Studies in Literature
Registration #0504-545
A study of the literature of deafness, with special emphasis on literary works which identify and illuminate "the deaf experience."

Class 3, Credit 5

GLLL-546 Philosophy of Justice
Registration #0504-546
Examination of dissent and private conscience in collision with the claims of order and stability in a democratic society.

Class 3, Credit 5

GLLL-548 Modem Poetry
Registration #0504-548
A close examination of poems of important English and American poets of the 19th and 20th centuries, including several living poets.

Class 3, Credit 5

GLLL-549 Women in Literature
Registration #0504-549
Reading and analysis of literature by and about women, mostly in the 19th and 20th centuries.

Class 3, Credit 5

GLLL-550 Jonathan Swift and the Age of Satire
Registration #0504-550
Vicious satirical writings of Jonathan Swift and other early 18th century authors (Alexander Pope, John Dryden) will be read and analyzed, focusing on the intrigue and scandals marking the political and religious environment of the age.

Class 3, Credit 5

GLLL-551 World Literature in English
Registration #0504-551
The course will cover short stories and novels written in English by Australian, African, Asian, and West Indian authors. The selections will be discussed against the background of the social, political, and cultural milieu in which the authors worked.

Class 3, Credit 5

GLLL-552 Milton: Literature of Revolution
Registration #0504-552
John Milton, the author of *Paradise Lost,* was the English Commonwealth's foremost propagandist and defender of regicide. His major works will be read and analyzed, focusing both on their literary brilliance and how they reflect the religious, moral, political, and philosophical turmoil of the 17th Century.

Class 3, Credit 5

GLLL-555 American Literature in the Industrial Age
Registration #0504-555
This course is a survey of the development of American culture from the Civil War to the early twentieth century. The reading will consist of selected literary and philosophical works of this period, and the course will concentrate on the American response to several developments of the period: the increasing power of technology and industry, the use of America as a world power, the growth of new philosophies and Social Darwinism and Marxism, and the pressure for social change arising from various reform movements.

Class 3, Credit 5

GLLL-560 **Art of the Cinema**
Registration #0504-560
A critical examination of certain films as an integral part of modern culture.

Class 3, Credit 5

Science and Humanities

GSHF-210 **Introduction to the Performing**
Registration #0505-210 **Arts: Music**
An introduction to the nature, form and significance of music and of the listening experience. Emphasis is placed on the development of a personal awareness of music through an examination of its structure, historical development and its purpose to society.

Class 3, Credit 4

GSHF-211 **Introduction to the Performing**
Registration #0505-211 **Arts: Film**
Emphasis on seeing and knowing good films. How the director exploits cinematic techniques to create a work of art is the focus for study and discussion of international cinema.

Class 3, Credit 4

GSHF-212 **Introduction to the Performing**
Registration #0505-212 **Arts: Chorus**
Examination of choral works from the 12th to the 20th century with emphasis on stylistic analysis and performance. Sight-reading and vocal production techniques will also be stressed. Genres include madrigals, motets, masses, chansons, and miscellaneous works by major composers. Some ability to read music is highly desirable.

Class 3, Credit 4

GSHF-213 **Introduction to the Visual Arts**
Registration #0505-213
To develop ability in perceiving worth in objects of art through consideration of fundamental concepts in fine arts, including organization, subject matter and principles of aesthetics.

Class 3, Credit 4

GSHF-503 **Survey of American Architecture**
Registration #0505-503
A survey of American architecture from the 17th century to the present. Stress will be placed on a visual as well as an historical and social analysis of American building art.

Class 3, Credit 5

GSHF-509 **Impressionism to Analytical Cubism**
Registration #0505-509
This course deals with the historical and stylistic aspects of the avant-garde painters of the second half of the nineteenth century and the first decade of the twentieth century. It traces the struggles of these artists to break away from the traditional forms of expression and to attain a new vision of reality.

Class 3, Credit 5

GSHF-512 **Master Drawings Since the**
Registration #0505-512 **Renaissance**
A study of drawings from the 15th to the 20th century, including the work by Leonardo da Vinci, Michelangelo, Durer, Rembrandt and Picasso.

Class 3, Credit 5

GSHF-513 **Oriental Art**
Registration #0505-513
A survey outlining the development of art in India, China and Japan and examining the philosophical circumstances that distinguish Eastern traditions.

Class 3, Credit 5

GSHF-514 **Cubism to the Present**
Registration #0505-514
An investigation into modern man's struggle to preserve his identity in our fast developing technological world as reflected in the vitality and diversity of today's visual arts. Differences and similarities with art forms of earlier eras and other cultures will also be discussed.

Class 3, Credit 5

GSHF-519 **Rembrandt Van Rijn: His Art and Times**
Registration #0505-519
A study of the life, art and times of the Baroque master. Emphasis will be placed on his stylistic evolution, his relation to his society and to the Baroque style, and on his humanistic world view.

Class 3, Credit 5

GSHF-520 **Picasso**
Registration #0505-520
The life and work of one of the most influential artists of our century.

Class 3, Credit 5

GSHF-525 **Major Symphonies**
Registration #0505-525
A non-specialized humanistic approach to the understanding of the people, ideas, and times during which major musical compositions were created.

Class 3, Credit 5

GSHF-526 **Twentieth Century Music**
Registration #0505-526
A survey of major 20th century composers and their works. Emphasis will be placed on the development of music in the classical tradition, experimental music, and jazz.

Class 3, Credit 5

GSHF-527 **Orchestral Music**
Registration #0505-527
Examination of selected orchestral works from the 18th to the 20th century with emphasis on listening and stylistic analysis. Works by Bach, Beethoven, Brahms, Tchaikovsky, Stravinsky, Bartok, and others.

Class 3, Credit 5

GSHF-528 **Romanticism in Music**
Registration #0505-528
A survey of music written during the Romantic Period (19th century), including later trends — Impressionism (Debussy, Ravel) and Neoclassicism (Satie, Stravinsky). Genres include orchestral music, chamber music, piano, song, ballet, and opera. Representative composers are Chopin, Brahms, Wagner, and Tchaikovsky.

Class 3, Credit 5

GSHF-529 **Visual Interpretation of the Drama**
Registration #0505-529
Study of the visual components in a play from the point of view of a theatrical designer. Plays from various countries and time periods will be studied in order to develop skill in interpreting character, literary style and dramatic structure and techniques for communicating this understanding to an audience through stage designs. Students will be expected to master the content of a selected group of plays as well as increase their ability to find visual equivalents through which to render their understanding.
The course is designed for upper division students with interest in dramatic literature, theater or the application of visual design to the performing arts.

Class 3, Credit 5

GSHF-530 **Art, Music and Ideas**
Registration #0505-530
This is a non-specialized course offering the student the opportunity to examine specific works of art and music against the background of ideas and concepts that influenced and animated the life of their times.

Class 3, Credit 5

GSHF-532 **African Tribal Art**
Registration #0505-532
After an investigation of the world of "primitive" man and the function of art in a tribal environment, this course will focus on preliterate societies of sub-Saharan Africa.

Class 3, Credit 5

GSHH-301 **Modern American History**
Registration #0507-301
Political, social, cultural, and economic development of the American people in the modern period.

Class 3, Credit 4

GSHH-302 Modern European History
Registration #0507-302
A thematic analysis of the major social, political, economic and intellectual movements of modern Europe. Special attention is given to the impact of European thought and institutions on the contemporary world.

Class 3, Credit 4

GSHH-303 Latin American History: From Independence
Registration #0507-303 to the Modern Period
Survey of historical development of Latin America.

Class 3, Credit 4

GSHH-310 The Future As History
Registration #0507-310
Through historical analysis from 1200 A.D. to the present, the course will study the social forces from the past that have caused today's major problems. Understanding this, it becomes possible to plan for the future to solve these problems.

Class 3, Credit 4

GSHH-313 Communism, Fascism and Democracy in
Registration #0507-313 Their Theoretical Foundations
A political and historical appraisal of these philosophies. Emphasis is placed upon the claims they make with regard to the individual and the state, and the changes they demand for the future.

Class 3, Credit 4

GSHH-316 The History of the World Since 1945
Registration #0507-316
Survey of the major events of world history since 1945: Europe, Africa, Asia, and the United States.

Class 3, Credit 4

GSHH-320 The Unification of Europe:
Registration #0507-320 Achievements and Perspectives
An analysis of the concept of Europe, of its making and disintegration, of its resilience after two World Wars, of the movement for a political union and of its first achievements: the Common Market and its goals up to 1972.

Class 3, Credit 4

GSHH-508 History of England
Registration #0507-508
A political and constitutional history of England from the Anglo-Saxon period to the present.

Class 3, Credit 5

GSHH-510 Contemporary Middle East
Registration #0507-510
An historical analysis of the origins of the modern Middle East with particular emphasis on the patterns of political developments in the region during the 19th and 20th centuries.

Class 3, Credit 5

GSHH-514 Race and Society
Registration #0507-514
A social, historical, political, religious and anthropological appraisal of the factors which have produced the differences between social appearances and social attainments of the world's population.

Class 3, Credit 5

GSHH-516 The Middle Ages and the Rise of Europe
Registration #0507-516
The Medieval society and its political, religious, economic, and social problems and achievements will be analyzed as the foundation and the cradle of our modern society.

Class 3, Credit 5

GSHH-518 The Advance of Communism
Registration #0507-518
An examination of the expansion of Communism from Marx up to the present time: an analysis of the basic ideas of Marxism, of the rise of communist parties and regimes in West and East Europe, in China and Southeast Asia, in Africa, and on the American continent.

Class 3. Credit 5

GSHH-51S United States-Latin American
Registration #0507-519 Diplomatic Relations
The emphasis in this course will be on analyzing the United States' relations with Latin America from independence to the present.

Class 3, Credit 5

GSHH-520 Crime, Violence and Urban Crisis
Registration #0507-520 in the 20th Century
The course will analyze the causes of the outbreak and rapid increase of violent and criminal trends in the world as the most serious realities of the 20th century.

Class 3, Credit 5

GSHH-522 20th Century American
Registration #0507-522 Diplomatic History
A narration and interpretation of the events and forces which shaped American foreign relations from 1898 to 1950. Special emphasis will be placed on such issues as the Open Door Policy, the Treaty of Versailles, Pearl Harbor and the Yalta Conference.

Class 3, Credit 5

GSHH-523 Religion in Society
Registration #0507-523
This course will examine religion in the West—Christianity, Judaism and atheism—as an integral and interrelated aspect of the totality of society.

Class 3, Credit 5

GSHH-524 The Italian-American Experience
Registration #0507-524
Examines the history and culture of the Italian-Americans from the colonial period to the present.

Class 3, Credit 5

GSHH-525 Culture and Counterculture in
Registration #0507-525 Historical Perspective
This course will examine the cultural, social, political and economic conflicts which were prominent during the 1960's in America and around the world.

Class 3, Credit 5

GSHH-526 The United States and The Third World
Registration #0507-526 Revolutions in the 20th Century
One of the dominant features of the 20th century has been the revolution of rising expectations in the countries of the Third World. This course will 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.

Class 3, Credit 5

GSHH-528 History of Popular Culture
Registration #0507-528 in America
A study of selected special social and cultural issues and topics in American history from the colonial period to thq present, focusing as well on leading personalities.

Class 3, Credit 5

GSHH-529 Military History
Registration #0507-529
An analysis of the causes and nature of war.

Class 3, Credit 5

GSHH-530 19th Century American
Registration #0507-530 Diplomatic History
An examination of American diplomacy from the early years of American independence to the emergence of the United States as a world power. The War of 1812, Monroe Doctrine, and Manifest Destiny are among the topics considered.

Class 3, Credit 5

GSHH-531 The Black Experience in America
Registration #0507-531
This course explores the history of blacks in America and treats it primarily from a social and cultural perspective.

Class 3, Credit 5

GSHH-532 Civil Liberties In American History
Registration #0507-532
The course will teach the history of civil liberties in America. Emphasis will be placed on analyzing Supreme Court cases that explain the current state of civil liberties. This is a companion course to GSHH-538, Social Justice and the Constitution in American History.

Class 3, Credit 5

GSHH-533 China, Russia and the United States
Registration #0507-533 Since 1949
This course is a follow-up of the other two courses on Russia, and on the advance of Communism.

Class 3, Credit 5

GSHH-536 History of Mexico
Registration #0507-536
The historical development of Mexico including the colonial period, independence movement, the liberal-conservative clash, and the revolution of 1910.

Class 3, Credit 5

GSHH-537 Russia: Imperial and Communist
Registration #0507-537
An analysis of the last century of Czarist Russia and of the Communist Regime. Emphasis will be placed on the agricultural, social, industrial, economic, and political situation.

Class 3, Credit 5

GSHH-538 Social Justice and the Constitution
Registration #0507-538 in American History
The course will analyze how well the constitution has met the social and political expectations of citizens. Emphasis will be placed on analyzing Supreme Court cases that explain the current state of social justice. This is a companion course to GSHH-532, Civil Liberties in American History.

Class 3, Credit 5

GSHH-540 Selected Problems In Black History
Registration #0507-540
A seminar approach to the thought of key black leaders (Washington, Garvey, King) and the study of the civil rights and black power movements.

Class 3, Credit 5

GSHH-541 Modern Germany
Registration #0507-541
A study of Germany in the 19th and 20th centuries.

Class 3, Credit 5

GSHH-543 20th Century European
Registration #0507-543 Diplomatic History
The course seeks to appraise the crisis of diplomacy, and the quest for a higher level of political organization in Europe in the age of mass democracies, totalitarianism and contending political ideologies.

Class 3, Credit 5

GSHH-544 19th Century European
Registration #0507-544 Diplomatic History
The course focuses on the relations of the European Great Powers, their rivalries and national jealousies which ultimately resulted in the first total war in the history of humanity.

Class 3, Credit 5

GSHH-545 Revolutionary Leaders in Latin
Registration #0507-545 America
In this course three movements will be 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, it is hoped that the student will come to an understanding of the historical perspective and nature of the social discontent in Latin America.

Class 3, Credit 5

GSHH-546 The Immigrant in American
Registration #0507-546 History
This course traces the history of the Irish, Germans, Jews, and Italians in the United States.

Class 3, Credit 5

GSHH-547 History of Social Discrimination
Registration #0507-547
A study of the discriminatory practices, present and historical, found in the United States. To include the cultural values and problems of acculturation for the American Indian, Black, Puerto Rican, Chicano, Asian, women, and religious groups, with emphasis on its implications to social work.

Class 3, Credit 5

GSSH-550 The Ascent of Man
Registration #0507-550
This course, based on Jacob Bronowski's BBC-PBC television series, analyzes the human, intellectual, religious, political, scientific, and historical development of Western man.

Class 3, Credit 5

GSHN-210 The Face of the Land
Registration #0508-210
The course is concerned with those selected aspects of geology that pertain to surface features of the earth. The aim is to acquaint students with landforms and the processes that produce and change them, and to show that policy for man's use of the land is being developed to protect the surface of the earth and the people who live on it.

Class 3, Credit 4

GSHN-211 Science and Human Values
Registration #0508-211
Concerned with the nature of scientific thought and the effect of scientific thinking and technological development on our values.

Class 3, Credit 4

GSHN-502 Social Consequences of Technology
Registration #0508-502
An attempt to identify, understand, and probe the causes of current technological problems.

Class 3, Credit 5

GSHN-503 Technology and the Individual
Registration #0508-503
A study of the effects on the life of the individual due to the acceleration of technological change.

Class 3, Credit 5

GSHN-504 Energy and the Environment
Registration #0508-504
An analysis in lectures, films, off-campus trips, class discussion, and a course paper, of the twin crises facing this country and the world in the use of energy: depletion of resources and environmental impact.

Class 3, Credit 5

GSHP-210 Introduction to Philosophy
Registration #0509-210
An introduction to some of the major problems in philosophy with readings from classical and/or contemporary sources.

Class 3, Credit 4

GSHP-211 Ethics
Registration #0509-211
An introduction to ethics through an analysis, comparison and evaluation of the main theories that have been offered as systematic ways of making ethical decisions. Readings from classical and/or contemporary sources.

Class 3, Credit 4

GSHP-212 Introduction to Biblical Studies
Registration #0509-212
An introduction to the bases of Jewish and Christian beliefs through the Old and New Testaments and related texts.

Class 3, Credit 4

GSHP-213 Introduction to Critical Thinking
Registration #0509-213
An introduction to philosophical analysis, especially as it may be applied in contexts other than professional philosophy.

Class 3, Credit 4

GSHP-302 Greek and Roman Philosophy
Registration #0509-302
This course will provide an account of Greek and Roman philosophy from what is known as the pre-Socratic period to the early Christian era.

Class 3, Credit 4

GSHP-502 Philosophy of Religion
Registration #0509-502
A critical examination of a number of important issues connected with religion. These include the nature of religion itself, the existence of God, the problem of evil, and questions about the language we use when we talk and write about religion.

Class 3, Credit 5

GSHP-504 Logic
Registration #0509-504
An introduction to the basic principles of logic. The main emphasis will be on symbolic, or formal logic, but some attention may be paid to informal logic as well.

Class 3, Credit 5

GSHP-507 Aesthetics
Registration #0509-507
This course will introduce students to thinking philosophically about the nature of art and its relation to other human experiences. Among the topics considered will be: the aesthetic experience, the relation between morality and art, ugliness in art, and truth in art.

Class 3, Credit 5

GSHP-511 Social Philosophy
Registration #0509-511
An introduction to some of the main problems of social philosophy through an analysis, comparison and critical examination of various views concerning the relation of morality to social policies, the nature of social justice, and the claim that there are certain natural human rights.

Class 3, Credit 5

GSHP-512 Philosophy of Science
Registration #0509-512
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.

Class 3, Credit 5

GSHP-513 Political Philosophy
Registration #0509-513
An introduction to the philosophical foundations of political thought: a critical examination of one or more of the most influential works in the field.

Class 3, Credit 5

GSHP-514 The Great Thinkers
Registration #0509-514
This course will introduce the student to the thought of some of those philosophers who have been most influential in the history of ideas. An attempt will be made to cover in some depth the works of one or more of those “great thinkers”. It is hoped that the student will begin to recognize the enduring nature of some of our most pressing problems, as well as the intellectual foundations of proposed solutions.

Class 3, Credit 5

Social Science

GSSA-205 Deafness in American Culture
Registration #0510-205
Using principles of cultural anthropology, this course investigates the cultural patterns of deaf Americans and how those patterns relate to those of other cultural systems in America.

Class 3, Credit 4

GSSA-210 Cultural Anthropology
Registration #0510-210
A study of the basic institutional patterns of behavior and of thought which the human animal uses to provide the means of life and experience.

Class 3, Credit 4

GSSA-501 Anthropological Research Methods: Explorations
Registration #0510-501 in Subcultural Diversity
This course is designed to expose students from a variety of backgrounds to an alternative means of understanding human behavior through the methods of the cultural anthropologist and to demonstrate that variations in cultural patterning exist in our presumably homogenous society. The primary emphasis in the course will be involvement of students in the actual observation of human behavior and collection of data in a sub-culture of their own selection in the Rochester area.

Class 3, Credit 5

GSSA-525 Planned Society
Registration #0510-525
A study of the principles of economic planning, of political decision making and of institutions of social control required to implement the plans of mankind for human survival. This course features a simulation laboratory.

Class 3, Credit 5

GSSA-530 Man Builds/Man Destroys
Registration #0510-530
A study of the nature, method, and scope of environmental responsibility confronting mankind in the eco-system of the planet earth. A multi-media presentation including the U.N.-SUNY television series.

Class 3, Credit 5

GSSE-210 Introduction to Economics
Registration #0511-210
A study of selected essential concepts of economics, combined with a discussion of some of the current economic problems of the American society, and the policies adopted to solve them. No prior familiarity with economics is required.

Class 3, Credit 4

GSSE-501 Contemporary Economic Systems
Registration #0511-501
An investigation of the functioning of modern capitalist and non-capitalist economies, and their problems. The USA and USSR are used as the main models, with aspects of other economies also included.

Class 3, Credit 5

GSSE-503 Personal Finance
Registration #0511-503
An introduction to basic problems and techniques of managing personal finances, based on the study of such main topics as budgeting, the use of credit, insurance and investment. Considerable emphasis will be placed on investment in stocks and bonds. Students will be required to do a considerable amount of library research, and to prepare research papers.

Class 3, Credit 5

GSSE-508 Urban Economics and Public Policy
Registration #0511-508
The course analyzes the following aspects of urban policy: employment, education and housing. The analytical framework places emphasis on interdisciplinary reasoning and institutional dynamics of policy implementation.

Class 3, Credit 5

GSSE-510 Human Resources
Registration #0511-510
The first section of the course will contain a microeconomic analysis of the labor market. The latter section will contain discussion of topics in human resources including education, manpower planning, and discrimination.

Class 3, Credit 5

GSSE-511 Economics and Politics of
Registration #0511-511 Consumer Protection
The course discusses the analytical background for simulation of decision-making in consumer protection policy from the perspectives of the consumer, the industry and the government. Emphasis is placed on interdisciplinary reasoning and current economic policy.

Class 3, Credit 5

GSSE-515 Contemporary International Economics Problems
Registration #0511-515
The first part of the course will concentrate on major commercial and investment issues in international economics. The second part will focus attention on adjustment mechanisms for a balance of payments disequilibrium and various structural and institutional aspects of the international monetary scene.

Class 3, Credit 5

GSSE-516 The Economics of Underdeveloped Countries
Registration #0511-516
The first part of the course will concentrate on the basic characteristics of “underdeveloped” countries and major limitations on their achieving a higher rate of development. The second part will discuss several policy measures needed to transform “underdeveloped" nations into “developed" nations and will also examine some case studies.

Class 3, Credit 5

GSSE-517 Fiscal Problems of Metropolitan Areas
Registration #0511-517
The course will be divided into two parts. Part one will deal with the existence of a large number of autonomous government jurisdictions in a metropolitan area and the major problems it poses, particularly the problem of efficient supply of local public services. Part two will deal with causes and cures of recent fiscal crisis of urban areas, with special reference to New York City.

Class 3, Credit 5

GSSM-210 Introduction to Political Science
Registration #0513-210
An introduction to the complex issues of politics, political behavior, and types of governmental structures. The purpose of this course is to develop analytical skills so that students as citizens may identify and deal with political alternatives.

Class 3, Credit 4

GSSM-211 American Politics
Registration #0513-211
To promote an understanding of the American political system and some of the major contemporary issues that confront it. Additionally, an analysis of the historical and philosophical roots of democratic political thought and studies of current political, economic, and social problems will be made in an attempt to separate myths from reality. Special emphasis will also be placed on the institutions of government, political parties, and interest groups.

Class 3, Credit 4

GSSM-212 American Political' Development
Registration #0513-212
An examination of the development of the American political system from the Constitutional Convention to the emergence of the Civil War. Emphasis will be placed upon personalities, theories, events, and trends which influenced the political evolution of the United States.

Class 3, Credit 4

GSSM-213 Introduction to Political
Registration #0513-213 Economy
The course will emphasize resource allocation between private and public goods, the costs and benefits of education, organizing and financing of medical and hospital services, problems of tax structure and tax reform, monopoly power and antitrust system, policies toward American agriculture, issues of urban housing and transportation, control of environmental quality.

Class 3, Credit 4

GSSM-215 Ideology and Politics
Registration #0513-215
The course is specifically designed to introduce lower division students to the interrelationship between ideology and politics from national, regional and international perspectives. Apart from nationalism, the ideologies of liberalism, socialism, communism and fascism in their theoretical contents and political implications will be carefully analyzed.

Class 3, Credit 4

GSSM-216 The American Presidency
Registration #0511-216
A study of the role of the presidency in the American political system. Among the topics to be examined are: evolution and expansion of presidential powers, nomination and election of the president, and the process of impeachment. Presidential administrations will be cited to illustrate the various subjects.

Class 3, Credit 4

GSSM-501 American Foreign Policy
Registration #0513-501
A study of the formulation and execution of American foreign policy. Special emphasis will be given to such topics as the American philosophy and ideology and it’s impact upon policy making, diplomatic procedures, the role of public opinion, and the functions of the instruments of government in foreign policy. Additionally, current policies will be discussed.

Class 3, Credit 5

GSSM-503 The Cold War
Registration #0513-503
An examination of the origins and evolution of the Cold War. Emphasis will be placed upon the Russian-American conflict in the post World War II era, but attention will also be given to the Sino-American rivalry during this period.

Class 3, Credit 5

GSSM-504 Twentieth Century America
Registration #0513-504
An examination of the major political, social, and economic developments affecting the United States in the 20th Century. Emphasis will be placed upon the reactions of the various presidential administrations to conditions in both the domestic and foreign fields.

Class 3, Credit 5

GSSM-S07 International Relations
Registration #0513-507
This course is designed to provide the student with an understanding of basic concepts and theories of international relations, American foreign policy, and the major developments in the contemporary world arena. Additionally, selected ideologies, doctrines, and institutions operative in the present international system will be analytically examined in order to shed light on the relationship between myth and objective reality in world politics.

Class 3, Credit 5

GSSM-508 Government and Politics of the Soviet Union
Registration #0513-508
The course is designed to examine various aspects of the Soviet political system. Emphasis will be placed on the role of ideology, the Party apparatus, and governmental institutions. Additionally, aspects of Soviet political culture (e.g., political socialization and the existence of interest group activity) will also be studied.

Class 3, Credit 5

GSSM-510 Comparative Politics
Registration #0513-510
This course is designed to provide a mode of analysis for the study of political systems. There will be a basic overview of such nations as the United States, Great Britain, France, the Federal Republic of Germany, and the Soviet Union, although relevant examples of other nations will be presented when warranted. A study of each nation's governmental process and political culture will be emphasized.

Class 3, Credit 5

GSSM-512 Urban Politics
Registration #0513-512
The course discusses the political development of intergovernmental fiscal relations with focus on problems of urban areas. Students are expected to develop position papers on the role of intergovernmental relations in cooperative federalism.

Class 3, Credit 5

GSSM-513 Foreign Policy of the Soviet Union
Registration #0513-513
A chronological and analytical study of Soviet foreign policy since its inception. Special emphasis will be placed on the importance of ideology, the institutions and people who make policy and the past and present relations with the United States, Western Europe, Eastern Europe, China and the Third World.

Class 3, Credit 5

GSSM-514 Theories of Political Systems
Registration #0513-514
A comparative examination of contemporary political theories viewed from the perspective of the earlier theories out of which they evolved. Emphasis is placed upon the value of theory, its practical application and its limitations.

Class 3, Credit 5

GSSM-520 Politics in China
Registration #0513-520
This course is designed to inform students of the political dynamics of the People's Republic of China. Major emphasis will be given to the historical background, major aspects of the political system, and the foreign relations of China.

Class 3, Credit 5

GSSP-210 Introduction to Psychology
Registration #0514-210
A selection of topics drawn chiefly from social and clinical psychology, learning, motivation, and personality with some reference to neuropsychology when relevant.

Class 3, Credit 4

GSSP-501 Industrial Psychology
Registration #0514-501
Consideration of principles, application and current research in industrial psychology, with particular reference to personnel selection, training, motivation, morale, performance appraisal, leadership and communication.

Class 3, Credit 5

GSSP-503 Abnormal Personality
Registration #0514-503
Description and theories of the nature and development of behavioral disorders. Contemporary treatment procedures will also be discussed.

Class 3, Credit 5

GSSP-504 Attitude Formation and
Registration #0514-504 Persuasion Techniques
The course will focus on current theories of attitude formation, and seek to apply them to contemporary events to achieve an understanding of how those who wish to shape or change attitudes do so.

Class 3, Credit 5

GSSP-508 Psychology of Learning
Registration #0514-508
A study of experimental investigation with emphasis upon the nature of the problems, procedures and theoretical significance of basic learning processes. This course will focus on selected topics related to human learning.

Class 3, Credit 5

GSSP-509 Psychology of Perception
Registration #0514-509
A study of methods and research findings primarily in the field of visual perception together with an evaluation of theoretical interpretations.

Class 3, Credit 5

GSSP-510 Social Psychology
Registration #0514-510
The course will attempt to give 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.

Class 3, Credit 5

GSSP-511 Humanistic Psychology: An Introduction
Registration #0514-511
Sometimes called "the new psychology." Based on the assumption that each individual has inherent powers of growth toward self-realization. Emphasis on conscious awareness, perception, meaningfulness, and uniqueness in human experience.

Class 3, Credit 5

GSSP-512 Psychology of Personality
Registration #0514-512
A consideration of theories of personality classification and development.

Class 3, Credit 5

GSSP-513 Psychology of Motivation
Registration #0514-513
The nature and development of motive and emotion and the role of these processes in adjustment. Covers concepts and theories of motivation.

Class 3, Credit 5

GSSP-514 Behavior Modification
Registration #0514-514
This course will teach you the skills of changing your behavior by controlling your environment and the consequences of your behavior.

Class 3, Credit 5

GSSP-515 Psychology of Human Adjustment
Registration #0514-515
This course will teach you the skills of coping with a variety of everyday experiences. Particular attention will be given to the areas of self validation, interpersonal tactics, and interpersonal relations.

Class 3, Credit 5

GSSP-517 Death and Dying
Registration #0514-517
This course will view America's last taboo subject from a social-psychological perspective. After dealing with topics such as the leading causes of death, 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, and how people can help others face death, and help themselves and others during periods of bereavement.

Class 3, Credit 5

GSSP-518 Psychology of Aging
Registration #0514-518
The Psychology of Aging course will present a psychological overview of human aging with some study of the dynamic problems of the elderly in contemporary society. Psychological aspects of adulthood and aging will be emphasized within the perspectives of an interdisciplinary approach.

Class 3, Credit 5

GSSP-519 Psychology of Altered States
Registration #0514-519 of Consciousness
This course will cover such topic areas as the specialized consciousness in the two halves of the brain, dreaming, hypnosis, meditation, systematic relaxation, and parapsychology. The course format will be discussion/demonstration.

Class 3, Credit 5

GSSP-520 Psychology of Creativity
Registration #0514-520
A psychological investigation of the creative process and creative individuals with a focus on techniques which stimulate creativity.

Class 3, Credit 5

GSSP-521 Psychology and Politics
Registration #0514-521
This course examines how political attitudes are acquired and altered, how politicians and ordinary citizens satisfy psychological needs through participation in politics and how principles of learning can illuminate processes of political leadership, persuasion and control.

Class 3, Credit 5

GSSP-522 Psychology of Art
Registration #0514-522
An introduction to psychological research in the area of cognition (thinking, perception, memory) and the application of these findings to the study of art.
Also included will be a critical examination of certain theories of personality and abnormality in terms of their relevance to the understanding of the artistic process. Emphasis will be on the areas of painting, sculpture, ceramics, photography and film.

Class 3, Credit 5

GSSS-210 Introduction to Sociology
Registration #0515-210
An introduction to the structure, function and development of human societies, with special attention to modern industrial societies in general and U.S. society in particular.

Class 3, Credit 4

GSSS-502 Contemporary Social Problems
Registration #0515-502
Contemporary problems of human living in society will be studied with recourse to local conditions and resources as aids to learning.

Class 3, Credit 5

GSSS-504 Intergroup Relations: American
Registration #0515-504 Racial and Ethnic Minorities
A sociological analysis of relations between ethnic, racial, and religious groups.

Class 3, Credit 5

GSSS-505 Juvenile Delinquency
Registration #0515-505
Problems of juvenile delinquency in the United States: etiology, extent and significance of the problem. This course features an in-depth study of family court and its procedures as well as modern methods of prevention, treatment and control.

Class 3, Credit 5

GSSS-511 Population & Society
Registration #0515-511
Study of demographic variables of mortality, fertility, and migration as they affect the rise and quality of population.

Class 3, Credit 5

GSSS-512 Urbanization: Urban Man
Registration #0515-512 and Society
The social and spatial characteristics of cities are analyzed, encompassing such topics as the reason for urban development, ecological factors, types and networks of settlements, and urbanism as a way of life.

Class 3, Credit 5

GSSS-517 Sociology of Deviant Behavior
Registration #0515-517
Examination of conditions under which deviance develops and changes over time. Study of individual deviance, deviant subcultures, and the transformation of a deviant identity.

Class 3, Credit 5

GSSS-518 Social Protest Movements
Registration #0515-518
The course will examine that pervasive phenomenon of modern life, the social protest movement from a sociological perspective.

Class 3, Credit 5

GSSS-519 Women's Studies:
Registration #0515-519 Selected Topics
An analysis of selected factors that contribute to our understanding of the present status of women.

Class 3, Credit 5

GSSS-520 Educational Sociology
Registration #0515-520 (Undergraduate)
The development of sociological and socio-psychological types of knowledge that have relevancy for or logical connections to educational practices. This course will be based on substantive material about social phenomena making up the social order in which the educational systems are operating and by which they are influenced.

Class 3, Credit 5

GSSS-521 Sociological Seminar
Registration #0515-521
A course of minimum procedural as well as substantive structure which approaches from a sociological perspective, matters of contemporary concern.

Class 3, Credit 5

GSSS-522 Medical Sociology
Registration #0515-522
This course is 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.

Class 3, Credit 5

GSSS-523 Sociology of the Black or
Registration #0515-523 Afrikan Experience
This seminar is designed to study the social movements directed towards social change. Aspects of black or Afrikan life and culture will be dealt with and emphasis is placed on the various ideologies among blacks.

Class 3, Credit 5

GSSS-524 Applied Sociology
Registration #0515-524
This course is an effort to provide 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. (Admission with instructor's approval only)

Class 3, Credit 5

GSSS-525 Sociology of Work
Registration #0515-525
This course will analyze the structural properties, group processes and social meanings of work. Work, like all other social realities, is a product wrought out of social relationships. Both theme/concepts of alienation and positive self regard will be studied within the context of individuals as they maintain their membership in groups related to work settings. This course is an appropriate selection for upper-class day students or continuing education students.

Class 3, Credit 5

GSSS-531 Marriage
Registration #0515-531
Contemporary trends in courtship patterns, male-female relationships and marital systems.

Class 3, Credit 5

GSSS-569 Human Sexuality
Registration #0515-569
An overview of various aspects of human sexuality including basic physiology, sex roles, sexual myths, legal and social issues, premarital and marital sexual behavior, and alternative sexual behavior.

Class 3, Credit 5

GSSS-570 **The Homophiles and Their Society**
Registration #0515-570
This course will examine the world of the homosexual, and an analysis of the diverse types to be found in it.

Class 3, Credit 5

Open Elective or Independent Study
The student has the freedom to select any course within the Institute or to create an independent study project subject to the approval of the student's dean or department chairperson, the faculty sponsor and the dean of the College of General Studies. An independent study course enables the interested student and his or her faculty sponsor to coordinate their efforts on subject and topics that range beyond the normal sequence of course selections. The student may, for example, participate in a volunteer community human service experience.

Credit variable

Service Courses

Service courses are required courses offered by the College of General Studies for specific professional departments. These courses may not be taken as general studies electives.

GLLC-402 **Conference Techniques**
Registration #0502-402
Basic theories of conference techniques including leadership, participation, types, and functions of public and private conferences and their evaluation. Student participation in training, problem solving, and informational-developmental conferences.

Class 4, Credit 4

GLLC-404 **Communication with the Handicapped**
Registration #0502-404
An examination of the communication difficulties with the handicapped. specifically the deaf, blind and others with physical handicaps. To include inter-personal, family, social and rehabilitation modes of communication. (Introduction to Psychology)

Class 3, Credit 4

GLLC-431, 432, 433 **Spanish I, II, III**
Registration #0502-431, -432, -433
This is a specially designed course in conversational Spanish which lays stress upon communications in different languages or in argot, slang, and vernacular of the various groups of clients with whom the social worker is likely to come in contact with. Proficiency in Spanish would satisfy this requirement.

Class 3, Credit 4

GSSE-301, 302 **Principles of Economics I, II**
Registration #0511-301, -302
A study of the basic concepts and principles pertaining to the economic behavior of the consumer and the firm (micro-economics), the economic problems of the nation (macro-economics), and international economic relations.

Class 3, Credit 4

GSSP-203 **Psychology of Childhood and Adolescence**
Registration #0514-203
A systematic, integrated, and interpretive study of a growing person. Includes physical, cognitive, social, moral and emotional development.

Class 3, Credit 4

GLLZ-200 **Basic Communications**
Registration #0518-200
Students will gain an understanding of deafness, plus basic skills which will permit communication with a segment of the deaf population.

Class 3, Credit 4

GLLZ-201, 202, 203 **Manual Communication I, II, III**
Registration #0518-201, -202, -203
A course designed to provide the student with the basic vocabulary of frequently used signs and the American manual alphabet.

Class 3, Credit 4

Graduate Courses in General Studies

GLLL-701 **Film History and Criticism**
Registration #0504-701
A critical examination of certain films as an integral part of modern culture. The emphasis of the course will be historical, with the development of cinema being traced through major films by important directors. There will be an opportunity to pursue individual interests.

Class 3, Credit 5

GSHF-703 **American Architecture**
Registration #0505-703
An examination of American architecture from the 17th century to the present designed for the graduate level of study. Emphasis will be placed on American building art in the late 19th and 20th century.

Class 3, Credit 5

GSHF-705 **Theories of Aesthetics**
Registration #0505-705
A course for the art oriented graduate student centering on the student's search for a supportable and reliable basis for making value judgments about works of art as well as introducing the student to major concepts in aesthetics.

Class 3, Credit 5

GSHF-707 **Cubism to the Present**
Registration #0505-707
Cubism as a way of seeing and as an expression of 20th century thinking. Differences and similarities with art forms of earlier eras and other cultures.

Class 3, Credit 5

GSHF-708 **Oriental Art**
Registration #0505-708
A survey outlining the development of art in India, China and Japan and examining the philosophical circumstances that distinguish Eastern artistic traditions.

Class 3, Credit 5

GSHF-710 **Art, Music and Ideas**
Registration #0505-710
An introduction to and analysis of those ideas, philosophies and human attitudes that are associated with and expressed in major works of art from Giotto and des Prez to Stravinsky, Picasso and Wright.

Class 3, Credit 5

GSHF-711 **20th Century American Art**
Registration #0505-711
An investigation of American art from the Civil War to the present. Emphasis will be placed on the visual arts but many references will be made to music and architecture.

Class 3, Credit 5

GSHF-712 **Arts and Crafts In Tribal Societies**
Registration #0505-712
A study of the function of "primitive" art and the techniques of its production, including the use of clay, stone, fibers, bark, wood, bronze, gold, etc. Hair-styling, body painting and scarification will also be discussed.

Class 3, Credit 5

GSHF-715 **Picasso**
Registration #0505-715
The impact of Picasso and his circle on twentieth century art. Affinities with modern scientific and philosophic attitudes.

Class 3, Credit 5

GSHF-716 **Rembrandt**
Registration #0505-716
A detailed analysis of the art and times of the Baroque master. Emphasis will be placed on the development of his style and technique, on his and other artists' relationship to their society and to the character of the Baroque outlook.

Class 3, Credit 5

GSHF-717 Music Literature
Registration #0505-717
A comparison of various musical styles from the 17th to the 20th century with emphasis on music's relationship to the other fine arts and its socio-cultural environments. Representative composers include Bach, Beethoven, Chopin and Stravinsky.

Class 3, Credit 5

GSHH-701 History of American Educational
Registration #0507-701 Thought and Practice
Traces the history of American education from the pre-Civil War years to the present.

Class 3, Credit 5

GSHH-703 History of the Renaissance
Registration #0507-703
The course will analyze the revival in society, literature, the arts, architecture, and political thought that occurred in Europe from 1300 to 1600. Major emphasis will be given European efflorescence associated with the ideal of Renaissance art and life.

Class 3, Credit 5

GSHP-704 Ethics and Philosophy of
Registration #0509-704 Education
To develop insights into various philosophies of education through a critical examination of their origins and viewpoints.

Class 3, Credit 5

GSSP-701 Developmental Psychology
Registration #0514-701
The course seeks to investigate the broad developmental patterns of normal human behavior, with emphasis on the growth of cognitive, personality, and culturally patterned behaviors.

Class 3, Credit 5

GSSP-702 Educational Psychology
Registration #0514-702
This course is designed to furnish students with an understanding of the basic psychological processes underlying the educational process, and to apply them to concrete situations that may arise for persons doing teaching.

Class 3, Credit 5

GSSP-710 Visual Concepts for Visual Practitioners
Registration #0514-710
An introduction to the analysis of basic principles of visual perception as they apply to the creation and interpretation of visual images, including 3-dimensional scenes, paintings, photographs, sketches, graphics, motion pictures and television. Emphasis will be on providing a structure for a better understanding on how the human visual system represents and relates visual information.

Class 3, Credit 5

GSSP-711 Psychology of Creativity
Registration #0514-711
A psychological investigation of the creative process and creative individuals with a focus on measures which stimulate creativity.

Class 3, Credit 5

GSSS-701 Educational Sociology
Registration #0515-701
The development of sociological and socio-psychological types of knowledge that have relevancy for or logical connection with educational processes. Based on substantive material about social phenomena making up the social order in which school systems are operating and by which they are influenced.

Class 3, Credit 5

College of Graphic Arts and Photography

School of Photographic Arts and Sciences

Biomedical Photography

PPHB-201, 202, 203 Biomedical Photography I
Registration #0901-201, -202, -203
Basic photography program for biomedical photographers with emphasis on theory, craftsmanship and visual communication. Patient photography, close-up and other photography as a foundation for future biomedical photography.

Class 4, Lab. 8, Credit 6/Qtr.

PPHB-211 Survey of Biomedical
Registration #0901-211 Photography
Career opportunities, typical biomedical photography settings, types of photography performed. Ethical, professional, and personal relationships with patient, physicians, research and staff personnel.

Class 1, Credit 1

PPHB-301, 302, 303 Biomedical Photography II
Registration #0901-301, -302, -303
Further study and practice of theory and principles used in biomedical photography, including photomacrography, photomicrography, hospital photography techniques, infrared and ultraviolet light, biological field sti^ies.

Class 2, Lab. 10, Credit 5/Qtr.

PPHB-331, 332, 333 Preparation of Biomedical
Registration #0901-331, -332, -333 Visuals
Study of basic principles of effective visual communication and design. Student will produce slide and slide/tape presentations and exhibition displays.

Lab. F-4, W-4, S-6, Credit 3/Qtr.

PPHB-501, 502, 503 Senior Thesis Production
Registration #0901-501, -502, -503
An investigation, planning, organization and production of an audio-visual presentation, a learning package or an informational program for a biomedical communications client.

Class 2, Lab. 8, Credit 4/Qtr.

Film and Television

PPHF-207 Introduction to Film Making (Super 8)
Registration #0902-207
A basic course for novices. Emphasis is on film making and the use of the medium as an interpretive and expressive form. There is no restriction on the choice of style or content. Learning will take place in a communal, participatory environment so that ideas can be shared and the medium experienced as a total, integrated process.

Short films by contemporary film makers will be screened to familiarize students with the diversity and potential of the medium.

A minimum of two independent film making projects are required of each student. One of these includes the use of sound.

Super 8 equipment and facilities are provided by RIT. Students are responsible for film and processing costs, 1/4 inch recording tape and editing incidentals. Approximate cost to students is $50.00 for the quarter.

Class , Lab., Studio, 7 hours. Credit 3

PPHF-208 Introduction to Film Making II (Super 8)
Registration #0902-208
An exploration of the diverse contemporary forms used to interpret and express subject matter in film. This course provides an opportunity for the student to make films which exploit traditional and experimental uses of camera, editing, sound, and attitudes toward subject matter. Although complete films can be attempted, the primary objective will be to create short film experiments.

Short films by film makers from the past and present will be screened to familiarize students with the diversity and potential of the medium.

Super 8 equipment and facilities are provided by RIT. Students are responsible for film and processing costs, 1/4 inch recording tape and editing incidentals. Approximate cost to students is $50.00 for the quarter. (Introduction to Film Making)

Class , Lab., Studio, 7 hours, Credit 3

PPHF-209 Basic Television Production (Art and Design)
Registration #0902-209
This is an overview course designed to familiarize students with the entire television production process. Emphasis is placed on design of graphics for television, shooting film and slides which conform to video system limitations and operation of the film-chain. Topics covered include basic visualization, camera operation, portable video equipment, studio production techniques and set design. Limited hands-on experiences include half inch portable systems, 'real time" studio production, limited studio electronic assembly techniques and video art techniques. (Permission of the Art and Design Department/SPAS. No previous media experience required.)

Lab and lecture required. Class 3 hrs., Lab. 4 hrs. Spring Quarter only.
Class 3, Credit 3

PPHF-401 Introduction to Film Making and
Registration #0902-401 Conceptual Film Production
Film making as a means of interpretation and expression. Film as a medium of communication, as a structural unity, the main elements of structure, organizational principles—with special application to the conceptual film form. A combined theoretical-practical approach to the dynamics of the film medium. The student is expected to demonstrate technical and theoretical knowledge through a series of film assignments. Production will be in non-sync (Super 8) format. Students furnish film and processing; equipment is furnished by the department.

Class 2, Lab. 6, Credit 4

PPHF-402 Introduction to Non Fiction
Registration #0902-402 Film Production
Film making as a means of interpretation and expression with exclusion of the conceptual film form. Application of the elements of structure and organizational principles appropriate to the main area of emphasis. A combined theoretical-practical approach to the dynamics of the film medium. The student is expected to demonstrate technical and theoretical knowledge of the film making process through a series of film assignments. Production will be in non-sync (Super 8) format. Students furnish film and processing; equipment is furnished by the department. (PPHF-401 or a satisfactory equivalent)

Class 2, Lab. 6, Credit 4

PPHF-403 Introduction to Fiction and Dramatic
Registration #0902-403 Shortfilm Production
Film making as a process of interpretation and expression with an emphasis in the narrative film form as applied to fiction and dramatic short films. Included will be the non-fictional narrative and conceptual film form. Application of the elements of structure are organizational principles appropriate to the main area of emphasis. A combined theoretical-practical approach to the dynamics of the film medium. The student is expected to demonstrate technical and theoretical knowledge of the film making process through a series of film assignments. Production will be in non-sync (Super 8) format. Students furnish film and processing: equipment is furnished by the department. (PPHF-402 or a satisfactory equivalent)

Class 2, Lab. 6, Credit 4

PPHF-407, 408, 409 Film History
Registration #0902-407, -408, -409
Survey of developments in film from the early beginnings to the present. Objective is to explore the uses of the medium within a historical, cultural and theoretical context. Each quarter will emphasize a different film form: 407 fiction feature, 408 documentary, 409 experimental and animation. No prerequisites. Admission during any quarter of the academic year.

Class 3, Credit 3/Qtr.

PPHF-421, 422 Writing for Film and Television
Registration #0902-421, -422
This course explores the writing of non-fiction and fiction for theatrical and non-theatrical films, and television. Experience in the writing of fiction concentrates on the elements of dramatic construction. The exploration of non-fictional writing examines information gathering techniques and methods of investigation. Both non-fiction and fiction are treated as expository, story-telling forms. Students are responsible for writing film or television scripts on subjects of their own choosing and for completing several brief written exercises in areas such as character, dialogue, the interview, suspense, and plot. Although this course is designed primarily to meet the needs of film and television majors, it is not restricted to those students. Winter and Spring Quarter.

Class 2, Lab. 3, Credit 3

PPHF-501 Visualization and Commercial
Registration #0902-501 Film Production
A general review of professional production methods and the theory and practice of visualizing an expressive film continuity. Basic synchronous sound recording is included. (PPHF-403 or permission of the instructor)

Class 2, Lab. 6, Credit 4

PPHF-502 Film Planning and Studio
Registration #0902-502 Operations
Introduction to studio crew work and editing systems for professional film. Budgeting and an elementary view of the economics of production are also included. Film writing is introduced and related to production planning (PPHF-501 or permission of the instructor)

Class 2, Lab. 6, Credit 4

PPHF-503 Film Project with
Registration #0902-503 Synchronous Sound
A short (5-10 min. suggested) film is produced by student teams. Advanced sound editing, sound mixing and A&B roll conforming are included; Cameras, lighting and editing equipment are provided but students are expected to provide sensitized goods.

Class 2, Lab. 6, Credit 4

PPHF-507 Basic Television Production
Registration #0902-507
Provides students with an introduction to the art and technology of video communications featuring a non-technical overview of television imaging. Opportunities include working with the television camera, basic portapak operation and single camera systems. Emphasis is placed on working with graphics and audio production—skills which will help provide potential employment markets. Other topics include "hands on" experience in system hook ups, basic lighting, a brief historical perspective, introduction to video switchers, audio board skills, writing to visuals and basic preproduction planning. Includes a very brief introduction to multicamera studio taping.

Lecture and Laboratory required. Class 2 hrs., Laboratory 4 hrs., Credits 4

PPHF-508 Studio Production Techniques
Registration #0902-508 (or Television
Provides students with an overview and practical experiences common to many "in house" studio facilities. Course includes studio operational procedures and policies. Lectures cover staging, camera blocking, refinement of directing and producing skills, operation of film chains, technical and esthetic limits of the television image, film techniques for television, review of the state of the art equipment, ENG/EFP trends, refinement of pre-production planning skills, special effects generators, understanding signal flow in the studio, working with talent. Key course aspects stress professionalism in studio environment and perceptual awareness.

Laboratory sessions feature practical commercial and educational “real time" studio situations, limited “hands on” experiences in electronic editing and post production techniques plus several demonstrations of topics covered in class. (PPHF-507 or permission of instructor - permission can be given to transfer students with previous television training)

Lecture and Laboratory required. Class 2 hrs., Laboratory 4 hrs., Credits 4

PPHF-509 Advanced Television Production
Registration #0902-509 Techniques
Includes an introduction to the concepts and utilization of industrial/educational training techniques via television, application of film style shooting in television, advanced lighting and staging, problems of remotes, television production, tour of professional facilities, public broadcasting, cable television, selection of equipment, preparation of specifications, patch panels, wave form monitors, camera shading, copyright and other legal problems, budgets, creative use of editing to reduce "in studio" production time and to improve quality and program effectiveness, periodicals and the organizations of broadcasting.

Practical laboratory exercises will include production of an instructional program, lighting and staging exercises, refinement of electronic editing techniques, remote television experiences and preparation of a final “portfolio” production. (PPHF-508)

Lecture and laboratory required as well as field trips and one “off hours” remote production. Lecture 2 hrs., Lab. 4 hrs., Credits 4.

General Photography

PPHG-200 Photography I
Registration #0903-200
A 10-week summer course for students entering the transfer program in photographic illustration and professional photography. This is equivalent of Photography PPHG-201, 202, 203.

Credit 12

PPHG-201, 202, 203 Photography I
Registration #0903-201, -202, -203
A program in basic photography with emphasis on craftsmanship, theory, and visual communications. The major aim is to enable the student to form a broad foundation of understanding and skills necessary for advanced study in photography available in upperclass programs. The completion of this foundation year allows the student to select a more specific program culminating in a bachelor of fine arts or a bachelor of science degree.

Class 3, Lab. 12, Credit 7/Qtr.

PPHG-207, 208, 209 Still Photography
Registration #0902-207, -208, -209
In the first quarter the 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 is covered.

The second and third quarters deal with more advanced techniques and principles of photography.

Class 1, Lab. 6, Credit 3/Qtr.

PPHG-210 Materials and Processes
Registration #0903-210 of Photography
A 10-week summer course for students entering the transfer program in photographic illustration and professional photography. This course is equivalent to PPHG-211, 212, 213 Materials & Processes of Photography.

Credit 6

PPHG-211, 212, 213 Materials and Processes
Registration #0903-211, 212, 213 of Photography
A basic study of the technology of photography, with emphasis on applications to real photographic problems. Learning experiences include workshop projects, demonstrations, lectures, discussions, and readings. Among the topics studied are image formation and evaluation, photosensitive materials, exposure, processing, tone reproduction, visual perception, color theory, variability, quality control, and photographic effects. An independent study project is required.

Class 2, Lab. 1, Credit 3/Qtr.

Photographic Illustration

PPHL-301, 302, 303 History and Aesthetics
Registration #0904-301 -302, -303 of Photography
Covering the history and aesthetics of photography from 1839 to the present, with special emphasis on the development of photographic seeing, and its related effect on other media. A survey of the numerous processes and how their development affected the image-making of their particular period, i.e., daguerreotypes, callitypes, ambrotypes, etc. Student projects are designed to illuminate phases of photographic history best understood by personal visual exploration.

Class 3, Credit 3/Qtr.

PPHL-311, 312, 313 BFA Photography II
Registration #0904-311, -312, -313
This is a common core course which is required of all second year illustration students.

Emphasis is placed on an integrated learning experience as an essential foundation to upperclass study in the various photographic disciplines. The course, therefore, is not taught as a complete body of knowledge, but rather as an open-ended investigation into many areas of technique and image-making.

The course should aid the student to make a selection in one of the four major areas of specialization offered to upperclass BFA degree candidates.

Class 3, Lab. 9, Credit 6/Qtr.

PPHL-401, 402, 403 Photography As a Fine Art I
Registration #0904-401, -402, -403
The major emphasis is placed on the individual’s learning to identify and articulate personal response to his environment through the medium of photography. Students design their own projects and work under the guidance of the professor. Traditional silver, as well as non-silver print-making techniques, may be utilized. (PPHL-303)

Class 2, Lab. 8, Credit 4/Qtr.

PPHL-411, 412, 413 Photojournalism I
Registration #0904-411, -412, -413
Journalistic photography for mass media publication with emphasis on the development of specialized skills in projects dealing with various aspects of reportage and all related editorial problems from caption writing, law and history, to organizational structures, printing processes, layout and design. Special emphasis is placed on the story as a total concept from inception to finished layout. Research and origination of material as well as the study of publications is explored. (PPHL-313)

Class 2, Lab. 8, Credit 4/Qtr.

PPHL-421, 422, 423 Nature Photography
Registration #0904-421, -422, -423
A course designed to help students become more concerned and visually aware of the natural environment. This is accomplished principally by direct involvement through study and photography of major natural forms. The student also acquires valuable basic understanding of the natural world, special photographic techniques and a broader concept of people’s attitudes toward and impact on their environment. (PPHG-203)

Class 2, Lab. 8, Credit 4/Qtr.

PPHL-431, 432, 433 Illustration Photography I
Registration #0904-431, -432, -433
Advanced and extended study of the making of photographs in the studio and on location. Emphasis on the growth of the imagination and aesthetic aspects of creating illusions. Investigation into the photographic medium as a means of communicating ideas. The development of individual vision and self expression through the disciplines of photography, both in black-and-white and color images. (PPHL-313)

Class 2, Lab. 8, Credit 4/Qtr.

PPHL-437, 438, 439 Visual Communications
Registration #0904-437, -438, -439 Workshop
Primarily a photographic course, however, emphasis is placed on experimental approaches to communications. Visual and phychological purpose of media will be explored. This course presupposes a basic background in design, as well as in photography.

Class 2, Lab. 8, Credit 4/Qtr.

PPHL-440 News Writing and News
Registration #0904-440 Reporting
Principles and practices of observing, interviewing, investigating, analyzing, organizing, and writing for publication in the news media. Emphasis will be on actual student work in all phases of news reporting and news writing, and class work will be focused on critical editorial appraisal of student projects.

Class 3, Credit 4

PPHL-501, 502, 503 Photography as a Fine Art II
Registration #0904-501 -502, -503
The major emphasis is placed on the individual's learning to generate and intensify personal statement through the medium of photography. Students select their own projects and work with their own ideas under the guidance of an instructor. Class discussions center around certain common problems found in working with this medium, such as the self-imposition of unnecessary limitations. Development of awareness of the other arts is continued. (PPHL-403 or PPHL-400)

Class 2, Lab. 8, Credit 4/Qtr.

PPHL-511, 512, 513 Photojournalism II
Registration #0904-511, -512, -513
A workshop course with emphasis upon the production of photographic images for publication in mass media. Study includes market research, marketing methods, accepted industry practices, as well as the production of photographic images for the market. (PPHL-413)

Class 2, Lab. 8, Credit 4/Qtr.

PPHL-521, 522, 523 Color Photography
Registration #0904-521, -522, -523 Workshop
A workshop course in which the student designs and executes projects in advanced color photography. Emphasis is on the aesthetic use of color photography techniques. (PPHL-313 or equivalent, and permission of instructor)

Class 2, Lab. 6, Credit 4/Qtr.

PPHL-531, 532, 533 Illustration Photography II
Registration #0904-531, -532, -533
Advanced individual creative approaches to visual problem solving. Conceptual ideas employing the photographic medium are stressed. The student is encouraged to find a personal photographic approach and to develop a portfolio. (PPHL-433 or PPHL-400)

Class 2, Lab. 8, Credit 4/Qtr.

Photographic Processing and Finishing Management

PPHM-201, 202, 203 Basic Principles
Registration #0905-201, -202, -203 of Photography
The program of study is designed to provide photographic marketing students with a thorough knowledge of the basic photographic process in order that they may have an understanding of how photographic products work. The course will include units of study in film characteristics, lighting, optics,photographic chemistry, sensitometry and color theory. Each of these will be related to the actual practice of photography.

Class 2, Lab. 6, Credit 4/Qtr.

PPHM-300 Production Processing and
Registration #0905-300 Finishing
A 10-week summer course which provides an opportunity for students who have completed basic photography to gain an understanding of all aspects of production processing and finishing. They will be involved with machine processing on a full production basis. A hands-on-type of learning experience will be the method most often employed in this course.

Class 2, Lab. 30, Credit 12

PPHM-301, 302, 303 Production Processing and
Registration #0905-301, -302, -303 Finishing
Provides an opportunity for photographic students to gain an understanding of the mechanical, electrical, electronic, chemical, and production concepts of automated processing and finishing. Studdents will be involved with automated processing and finishing on a full production basis. (PPHS-203, or PPHG-213 and PPHG-203)

Class 2, Lab. 8, Credit 4/Qtr.

PPHM-310 Survey of Production
Registration #0905-310 Processing and Finishing
Provides the non-photographic processing and finishing major with an opportunity to become knowledgeable in the operational procedures and services of a processing and finishing laboratory. (PPHM-203)

Class 2, Credit 2

PPHM-320, 321 Mechanics of Photographic
Registration #0905-320, -321 Hardware
The course will cover causes, effects and benefits of the application of basic principles of optics, mechanisms and electronics embodied in the type of hardware handled by retail and wholesale photographic establishments catering to the general public. (PPHM-203)

Class 4, Credit 4/Qtr.

PPHM-401, 402, 403 Photographic Process Control
Registration #0905-401, 402, 403
Statistical methods of studying repetitive processes, with special application to photographic processing; methods of obtaining data about processes, including chemical and physical factors; methods of making process adjustments, including automatic control methods. (PPHM-203)

Class 2, Lab. 6, Credit 4/Qtr.

PPHM-410, 411, 412 Training and Supervision of
Registration #0905-410, -411, -412 Photographic Processing
and Finishing Laboratory Personnel
Provides an opportunity for the processing and finishing management students to experience supervisory and training techniques as they prepare and use training aids and techniques in the actual supervision of the various work areas in the processing and finishing laboratory. (PPHM-303 or PPHM-300)

Class 2, Lab. 8, Credit 4/Qtr.

PPHM-511, 512, 513 Advanced Production Processing
Registration #0905-511, -512, -513 and Finishing
This course taken during the last year of study provides the student with an opportunity to study in depth, on an independent basis, those areas of processing and finishing which the student finds most interesting. This course may also be used to strengthen those areas of interest in which the student feels a weakness. (PPHM-303)

Lab. 12, Credit 4/Qtr.

PPHM-520 Operation, Care and Maintenance of
Registration #0905-520 Photofinishing Equipment
This course will provide the student with an opportunity to gain a thorough understanding of the mechanical, optical, and electrical aspects of the major pieces of photofinishing equipment. This course will employ the latest techniques in programmed learning, demonstrative hands-on experience, and lectures so that the student will be able to operate and perform basic care and maintenance on major pieces of processing and finishing equipment. Broad principles learned here will be applicable over a wide range of equipment. (PPHM-412)

Lab 3, Credit 1

Professional Photography

PPHP-301, 302, 303 Photography II
Registration #0906-301, -302, -303
Advanced applied photography in black-and-white and color with emphasis on craftsmanship, problem solving, and visual communications. Further emphasis is placed on the development of the student's ability to apply creative thinking and contemporary techniques in executing meaningful and effective professional photographs for a wide variety of media and utilization. (PPHP-203)

Class 3, Lab. 11, Credit 6/Qtr.

PPHP-311, 312, 313 Basic Color
Registration #0906-311, -312, -313
Color photographic image-making based on the study of color principles, color vision and color photographic material and processes. Part of this course is a visual design workshop which explores what constitutes an image, concentration in visual awareness, perception and sensitivity. Color transparencies are emphasized in the design workshop, and practices in negative-positive printing, negative analysis, internegative making, transparency duplicating, and the use of special processing techniques are used to emphasize theory.

Class 2, Lab. 4, Credit 3/Qtr.

PPHP-407 AV Preparations and Presentations
Registration #0906-407
A survey of the problems involved in conceiving, constructing and exhibiting audiovisual productions. Special emphasis is placed on photographic techniques and how they relate to other phases of production. (PPHP-313, -303, or PPHL-313)

Class 2, Lab. 8, Credit 4

PPHP-408 Scientific and Technical Applications
Registration #0906-408 of Photography
An introduction into the field of photography as it applies to technical problem solving. Event timing, photo sensing, visible and invisible radiation recording are presented in class and laboratory projects. (PPHP-303, PPHP or PPHL-313)

Class 2, Lab. 8, Credit 4

PPHP-409 Corporate and Special Interest
Registration #0906-409 Publications
A survey of this type of publication with particular emphasis on the photographic problems involved. Skill building assignments to improve competence and an introduction into the problems of the art director, editor, printer, layout person, and writer form the basis of the course content. (PPHP-303, PPHP or PPHL-313)

Class 2, Lab. 8, Credit 4

PPHP-411, 412, 413 Sensitometry
Registration #0906-411, -412, -413
Provides the professional photographer with technical tools for solving photographic problems. Topics include statistical concepts, process control methods, sensitometry, densitometry, tone reproduction systems, color reproduction systems, and image evaluation. (SMAM-212, PPHP-203)

Class 3, Lab. 3, Credit 4/Qtr.

PPHP-421, 422, 423 Advertising Photography
Registration #0906-421, -422, -423
A course built strictly to the standards of professional photography. Only those students who seriously aspire to be professional craftspeople should enroll. The assignments are specific and vary from strictly commercial to advertising illustration. In addition, the student is encouraged to specialize in the direction of his or her own natural ability and interests. Approximately half of the photography will be in color. (PPHP-303 and/or PPHP-313-PPHL-313)

Class 2, Lab. 7, Credit 4/Qtr.

PPHP-431 Forensic Photography
Registration #0906-431
The use of photography in forensic application for business and industry, surveillance, photographic evidence, forgery detection, safety. (PPHP-203)

Class 2, Lab. 6, Credit 4

PPHP-441, 442, 443 Advanced Color Printing
Registration #0906-441, -442, -443
This course is designed to give the student an advanced study in color techniques and theory in relation to quality and creative use of photographic materials. The student may choose subjects for independent study such as the dye transfer process, quality control methods in printing and processing and special masking. (PPHP-313 or some previous experience is required.)

Lab. 8, Credit 4/Qtr.

PPHP-461 Micrographics
Registration #0906-461
A one-quarter course designed to acquaint the professional photography student with a career in the micrographic industry. It is directed to familiarize the student with microimaging techniques and materials utilized in microfilm production situations as well as in media production situations where the creation and reproduction of illustrative imagery is of prime importance. (PPHP-303 required)

Class 1, Lab. 5, Credit 4

PPHP-501, 502, 503 Industrial Photography
Registration #0906-501, -502, -503 Seminar
Depending on the student's interest, the course is subdivided into three areas of emphasis.

(a) AV Preparations and Presentations; a continuation of PPHP-407 to a greater depth on a seminar basis. (PPHP-407 or permission of the instructor)

(b) Instrumentation; a continuation of PPHP-408 to a greater depth on a seminar basis. (PPHP-408, or permission of the instructor)

(c) Corporate and Special Interest Publications; a continuation of PPHP-409, or permission of the instructor)

Class 2, Lab. 3, Studio 5, Credit 4/Qtr.

PPHP-521, 522, 523 Advanced Color Seminar
Registration #0906-521, -522, -523
This course is designed to give advanced students an opportunity to work relatively independently to either develop their portfolios and/or to explore specific areas of interest in depth, either in the picture making areas or in image/materials manipulation techniques. It combines the individual initiative aspects of independent study with the advantages of shared class critiques. Lectures and other profession related experiences. (PPHP-303, -313, or PPHL-313 and permission of instructor are required)

(PPHP-423, -443, or PPHL-433 are suggested)

Class 2, Lab. 6, Credit 4/Qtr.

PPHP-541 Basic Portrait Photography
Registration #0906-541
Basic portraiture with the professional photographer's approach. Black-and-white and color retouching are included and instruction is given in special printing and finishing techniques. (PPHP-303. PPHP-313 or PPHL-313)

Lecture 3, Lab. 2, Credit 4

PPHP-542 Advanced Portrait Photography
Registration #0906-542
Advanced portraiture with the professional photographer's approach. Black-and-white and color retouching are included, and instruction is given in special printing and finishing techniques (PPHP-541)

Lecture 3, Lab. 2, Credit 4

PPHP-543 Contemporary Portrait Photography
Registration #0906-543
Contemporary portraiture with the professional photographer's approach. Black-and-white and color retouching are included, and instruction is also given in special printing and finishing techniques. (PPHP-542)

Lecture 3, Lab. 2, Credit 4

PPHP-551, 552, 553 Special Topics in
Registration #0906-551, -552, -553 Photography
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. (PPHP-303)

Credit variable

Photographic Science and Instrumentation

The two courses, PPHS-200 and PPHS-210, are special intensive summer courses designed for students transferring into the Photographic Science and Instrumentation program, and for others who desire a background in photographic science and instrumentation at an introductory engineering level. Students planning entrance at the third year take both courses concurrently.

PPHS-200 Fundamentals of Photographic
Registration #0907-200 Science I
An intensive course presenting the subject matter normally taken by photographic science and instrumentation students during their first year. Topics include the basic physics and chemistry of photosensitive systems, characteristics of radiation, introduction to sensitometry and tone reproduction, and applied photography.

Credit 9

PPHS-201, 202, 203 Photography for Scientists
Registration #0907-201, -202, -203 and Engineers
An introduction to the theory and applications of radiation-sensitive materials and systems. Physical properties of photographic materials, characteristics of radiation, sensitometric properties of photosensitive materials, processing chemistry, and fundamentals of black-and-white and color photography.

Class 3, Lab 3, Credit 4/Qtr.

PPHS-210 Fundamentals of Photographic Science II
Registration #0907-210
An intensive course presenting the subject matter normally taken by photographic science and instrumentation students during their second year. Topics include the chemistry and physics of black-and-white and color materials and processes as a continuation of the topics covered in PPHS-200. (PPHS-200 or PPHS-203)

Credit 9

PPHS-311 Advanced Sensitometry of Black-and-White
Registration #0907-311 Photographic Materials
The design of sensitometers for exposing photographic materials to light and other forms of radiation; densitometry; the measurement of exposure and processing effects; the analysis of data from sensitometric tests; spectral response measurement; objective and subjective tone reproduction; the performance of the human visual system. The laboratory includes two extended problems on topics chosen by the student. (PPHS-203)

Class 2, Lab. 6, Credit 4

PPHS-312 Applied Processing
Registration #0907-312
Problems in applied processing and the application of analytical chemical techniques to the control of black-and-white and color processing solutions. Processing faults, and image restoration, trouble shooting, archival permanence, ecology and processing machine operation. Statistical techniques application to machine control. (SCHG-206, PPHS-202)

Class 2, Lab. 6, Credit 4

PPHS-313 Color Systems
Registration #0907-313
Introduction to color and color imaging systems; systems of color specification; additive and subtractive trichromatic systems of color recording and reproduction; the technology of color photography; sensitometry and densitometry of color materials; introduction to graphic reproduction and electronic systems. Laboratory work in the exposure and evaluation of color photographic materials. (SMAM-305, PPHS-201 through PPHS-312)

Class 3, Lab. 3, Credit 4

PPHS-401 Radiometry
Registration #0907-401
The course serves as an introduction to the physics of light, its generation, propagation, absorption and measurement. This is combined with an introduction to the human visual process, to general photometry and radiometry, to light sources and to light receivers. (SMAM-205, SPSP-313, PPHS-311)

Class 3, Lab. 6, Credit 5

PPHS-402 Image Microstructure
Registration #0907-402
Introduction to image formation and structure; mathematical models for spread functions of image-forming elements and detectors; superposition and convolution; noise; sinusoidal response functions; figures of merit; characteristics of instruments used for small-scale image measurements. Laboratory work in microdensitometry and subjective image evaluation. (SMAM-305, PPHS-203, SPSP-313)

Class 3, Lab. 5, Credit 5

PPHS-404 Introduction to Scientific Research
Registration #0907-404
A course for third-year students in photographic science and instrumentation designed as preparation for the fourth-year research project. Project selection and the use of scientific literature; preparation of proposals; research notebooks; patents; considerations in data collection and analysis; written and oral presentations. (Third-year status in Photographic Science and Instrumentation or permission of the instructor)

Class 2, Credit 2/Qtr.

PPHS-411 Statistical Inference
Registration #0907-411
Hypothesis testing, confidence intervals, and sample size for variables; introduction to analysis of variance and regression analysis.

Class 2, Lab. 2, Credit 3

PPHS-412 Design of Experiments
Registration #0907-412
Basic designs for experiments, objectives, conclusions, error estimation, data analysis; continuation of analysis of variance and regression analysis; response surfaces and factorials.

Class 2, Lab. 2, Credit 3

PPHS-413 Statistical Quality Control
Registration #0907-413
Basic probability, control charts, sampling plans, power and O.C. curves, and modern applications of product and process control.

Class 2, Lab. 2, Credit 3

PPHS-421, 422, 423 Photographic Chemistry
Registration #0907-421, -422, -423
The chemistry and photographic properties of photographic emulsions and developer solutions at the intermediate level; topics in physical, organic, and analytical chemistry necessary to the continued study of photographic science. (PPHS-312, SCHG-207)

Class 3, Lab. 3, Credit 4/Qtr.

PPHS-501, 502, 503 Research
Registration #0907-501, -502, -503
An investigation of a problem in photographic science or engineering, including planning and execution of experiments, statistical data analysis, and reporting results orally and in a written paper. (PPHS-403, 413)

Class 2, Credit 2 (Winter and Spring)

Class 2, Lab. 6, Credit 4 (Fall)

PPHS-511, 512, 513 Optical Instrumentation
Registration #0907-511, -512, -513
Principles of geometrical and physical optics, image evaluation, optical instruments, and instrumentation. (SMAM-305, SPSP-313, PPHS-303)

Class 3, Credit 3/Qtr.

PPHS-521, 522, 523 Image Systems and Evaluation
Registration #0907-521, -522, -523
An analytical approach to analysis and evaluation of photo-optical and other image recording systems; objective and subjective evaluation techniques and their correlation. The use of convolution, correlation, autocorrelation, and Fourier methods in the analysis of the image recording systems. Laboratory work in the design of photo-optical systems. (PPHS-403, SMAM-305, SPSP-313)

Class 2, Lab. 6, Credit 4 (Fall)

Class 2, Credit 2 (Winter & Spring)

PPHS-531, 532, 533 Theory of the Photographic
Registration #0907-531, -532, -533 Process
An advanced course in photographic theory: sensitivity, emulsions, latent image, and processing of both black-and-white and color materials; chemistry and physics of selected non-silver and other non-conventional processes. (PPHS-423, SPSP-313)

Class 3, Credit 3/Qtr.

PPHS-551, 552, 553 Special Topics in Photographic Science
Registration #0907-551, -552, -553
Topics of special interest, varying from quarter to quarter, selected **from** the field of photographic science and not currently offered in **the** Division's curriculum. Specific topics are announced in advance. **(Not** offered each quarter. Consult staff chairman of the Photographic Science Division)

Class, Credit: variable

PPHS-599 Independent Study
Registration #0907-599
Faculty directed study of appropriate topics on a tutorial basis. Approval of the proposal by the staff chairman of the Photographic Science Division required.

Class , Credit: variable

Graduate Courses (Fifth year of five-year program)

PPHS-711, 712, 713 Theory of the Photographic
Registration #0907-711,-712, -713 Process
Physical structure and optical properties of the silver halide emulsion and their relations to the characteristic curve; chemistry and preparation of emulsions; treatment of theory of sensitivity and latent image formation; chemistry and kinetics of processing; chemistry and physics of selected non-silver processes.

Class 3, Credit 3/Qtr.

PPHS-731, 732, 733 Instrumental and
Registration #0907-731, -732, -733 Photographic Optics
The principles of geometrical and physical optics with application to photographic instrumentation systems. First-order imaging, aberrations and geometrical image evaluation, mirror and prism systems, the eye and vision characteristics, radiometry of optical images, basic instrument systems, electromagnetic waves, polarization, interference and interferometers, coherence, Fraunhofer and Fresnel diffraction, function transfer description of imaging system performance.

Class 3, Credit 3/Qtr.

PPHS-741, 742, 743 Analysis and Evaluation
Registration #0907-741, -742, -743 of Imaging Systems
Complex variables and Fourier analysis with application to the evaluation of imaging systems; properties of optical images, structure of photographic images; methods of photo-optical system evaluation.

Class 2, Lab. 6, Credit 4 (Winter)

Class 3, Credit 3 (Fall and Spring)

PPHS-751, 752, 753 Special Topics in
Registration #0907-751, -752, -753 Photographic Science
Advanced topics of current or special interest, varying from quarter to quarter, selected from the field of photographic science. Specific topics announced in advance. (Not offered every quarter. Consult coordinator of the photographic science graduate program.)

Credit 3/Qtr.

PPHS-890 Research and Thesis Guidance
Registration #0907-890
Thesis based on experimental evidence obtained by the candidate in an appropriate field as arranged between the candidate and his or her advisor.

Credit 9 minimum for MS

PPHS-700 Principles of Photographic Science
Registration #0907-700
A course intended for students who have completed their undergraduate programs in engineering or the sciences and who desire to prepare themselves for entry into the graduate program in photographic science and instrumentation or who desire a working knowledge of photographic science at an undergraduate level. It is an intensive course, assuming working knowledge of undergraduate mathematics, physics and chemistry. Course topics include radiation and radiometry, properties of radiation-sensitive materials, chemistry of photographic processing, sensitometry, tone reproduction, principles of color measurement, color photographic systems, image microstructure, and photographic instruments. The course includes both lectures and laboratory work. (Registration requires consent of the graduate coordinator.

Credit 15 (Summer only)

(Not applicable to the 45 required graduate credits in the photographic science and instrumentation graduate program)

PPHS-701, 702, 703 Principles of Photographic
Registration #0907-701, -702, -703 Science
Equivalent to PPHS-700, but offered in the evening and Saturdays during the regular Fall, Winter and Spring Quarters. (Preliminary admission to MS program in Photographic Science or consent of graduate coordinator)

Credit 5/Qtr.

(Not applicable to 45 required graduate credits)

PPHS-721, 722 Mathematics and Statistics
Registration #0907-721, -722 for Photographic Systems
A special graduate course in mathematics and applied statistics involving those areas of direct concern in design, analysis, and evaluation of photographic systems.

Credit 4/Qtr.

PPHS-731, 732, 733 Instrumental and
Registration #0907-731, -732, -733 Photographic Optics
The principles of geometrical and physical optics with application to photographic instrumentation systems. First-order imaging, aberrations and geometrical image evaluation, mirror and prism systems, and eye and vision characteristics, radiometry of optical images, basic instrument systems, electromagnetic waves, polarization, interference and interferometers, coherence, Fraunhofer and Fresnel diffraction, function transfer description of imaging system performance.

Class 3, Credit 3/Qtr.

PPHS-741, 742, 743 Analysis and Evaluation
Registration #0907-741, -742, -743 of Imaging Systems
Complex variables and Fourier analysis with application to the evaluation of imaging systems; properties of optical images, structure of photographic images; methods of photo-optical system evaluation.

Class 2, Lab. 6, Credit 4 (Winter)

Class 3, Credit 3 (Fall and Spring)

PPHS-751, 752, 753 Special Topics in
Registration #0907-751, -752, -753 Photographic Science
Advanced topics of current or special interest, varying from quarter to quarter, selected from the field of photographic science. Specific topics announced in advance. (Not offered every quarter. Consult coordinator of the photographic science graduate program.)

Credit 3/Qtr.

PPHS-890 Research and Thesis Guidance
Registration #0907-890
Thesis based on experimental evidence obtained by the candidate in an appropriate field as arranged between the candidate and his or her advisor.

Credit 9 minimum for MS

Master of Fine Arts in Photography

PPHG-700 Fundamentals of Photographic
Registration #0907-700 Communication
A summer course for students entering the graduate program with insufficient undergraduate credits in photography and/or the visual arts.
An intensive survey of photographic materials, processes, equipment and practice; workshop in the application of photography to the solution of problems in visual communication and design.
Undergraduate credit (15 hours) will be granted upon completion.

PPHG-701, 702, 703 History and Aesthetics of Photography
Registration #0903-701, -702, -703
An intensive inquiry into the history and aesthetics of photography to the present. Some of the areas of exploration: the rise and development of portrait, architectural and landscape photography in the 19th and 20th centuries; a survey of old and recent processes and how they affect the image-making of their particular period; exploring new frontiers; the photographers of the geological and geograhical U.S. Surveys and NASA moonscapes; “straight” photography vs. pictorialism: 135-year battle; the document and Robert Frank’s *Americans* and the evolution of color photography.

Credit 3/Qtr.

PPHG-705, 706, 707 Student/Faculty Seminar
Registration #0903-705, -706, -707
An all purpose weekly meeting to facilitate communication among all members of the MFA community.

Credit 1/Qtr.

PPHG-720, 721, 722 Photography Work Shop
Registration #0903-720, -721, -722
Photographic communications workshop. Individually planned studies in photographic visual communication as determined by faculty-student consultation based on the student's personal objectives. Research, group critiques, seminars, studio and laboratory practice, field trips.

Credit Total 9

PPHG-725, 726, 727 Photography Core
Registration #0903-725, -726, -727
Major emphasis is placed on the individual's learning to generate and intensify his or her personal statement through photography. Some of the projects are assigned while others are selected by the candidate.
Required for still photography majors.

Credit 3/Qtr.

PPHG-730, 731, 732 Cinematography
Registration #0903-730, -731, -732
Film making workshop. Individually planned studies in cinematography, as determined by faculty-student consultation, group critiques, seminars, studio and laboratory practice, field trips.

Credit Total 9

PPHG-740, 741, 742 Photographic Museum Practice
Registration #0903-740, -741, -742
Museum internship workshop, still or motion picture; research, assigned projects, seminars in history, function and administration of museums, with emphasis on photographic curatorial duties; practice in exhibition planning and development; field trips. This cannot be selected as a minor concentration.

Credit 3-9/Qtr.

PPHG-751, 752, 753 Special Topics Workshop
Registration #0903-751, -752, -753
Advanced 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 3-9/Qtr.

PPHG-799 Independent Project
Registration #0903-799
The student proposes an advanced project to an individual instructor. The student and the instructor are jointly responsible that the material to be covered is appropriate to the student's program and that the number of credits proposed are justified. Both will sign the proposal which must also be approved by the graduate coordinator and the director of the school.

Credit 1-9

PPHG-889 Pre-Thesis Seminar
Registration #0903-889
Development and statement of written thesis proposal with emphasis on research required and exposure to various concepts of MFA thesis possibilities.

Credit 1

PPHG-890 Research and Thesis
Registration #0903-890
Research, execution of a creative project and presentation of an acceptable exhibition with emphasis on technique, design, and communication. The candidate will select his or her thesis subject with the approval of the graduate committee and will deposit a suitable report and record of the thesis with the Institute. Museum majors will plan, assemble and take full responsibility for mounting a major photographic exhibit under the sponsorship of Rochester Institute of Technology, or a major museum or educational institution. The announcement, catalog, reviews and a satisfactory illustrated report of the project must be deposited with the Institute.

Credit 1-12

PPHG-760 Perceptual Principles
Registration #0903-760
An advanced course which provides an applied psychological framework for the ways we select, code, organize, store, retrieve and interpret visual images.

Credit 3

School of Printing

Management Courses

PPRM-201 Introduction to Technical Writing
Registration #0910-201
Basic approach to fundamentals of modern technical writing; review of English and writing skills; consideration of principles, techniques, form and style.

Class 3, Credit 3

PPRM-301 Application of Computers to
Registration #0910-301 the Graphic Arts
A study of the applications of automated data processing involving the graphic arts industry. Topics include historical development, basic theory and concepts, general and special purpose computer applications. Both technical and managerial aspects of applications are considered.

Class 4, Credit 3

PPRM-302 Personnel Relations I
Registration #0910-302
An introductory study of human relations in the printing industry, emphasizing the personnel management aspects of a supervisor’s job. Students study problems of individual behavior and how workers are affected by organizational influences. Case analysis is used extensively.

Class 3, Credit 3

PPRM-310 Industrial Organization and Management
Registration #0910-310
An introductory level course which includes such main topic headings as management fundamentals, planning, controlling, organizing, the behavioral environment and managerial adaptation to changing circumstances. Although some emphasis is put on newspaper industry applications, the fundamentals apply to all organizations.

Class 3, Credit 3

PPRM-401 Estimating I
Registration #0910-401
Introductory course in current estimating practices; the development of hourly costs and production rate standards; costs of materials and outside services; one-color offset press and flat sheet bindery operations; introduction to flat sheet imposition and pre-planning techniques; obtaining and interpreting specifications; design and use of estimating forms; pricing for a profit margin; preparing the quotation. (PPRT-311, PPRM-501)

Class 4, Credit 4

PPRM-402 Estimating II
Registration #0910-402
Continuing study of sheet-fed offset lithography estimating; multi-color offset presses and signature-related bindery operations; signature imposition; camera, layout, stripping and plate processing production standards; phototypesetting and mechanical artwork costs; color separations and the costs associated with process color printing; finishing operations; the application of the computer to estimating procedures. (PPRM-301 and PPRM-401 required; PPRT-312 recommended)

Class 4, Credit 4

PPRM-403 Printing Production Management I
Registration #0910-403
Examines the non-technological functions of production as components of a system, emphasizing organizational alternatives relating to human factors. Includes such topics as organization, systems approach, decision making, production planning and control, purchasing, inventory control, quality control, methods analysis, work measurement. Some simple analytical models based on graphs or elementary algebra are introduced.

Class 3, Credit 3

PPRM-404 Printing Production Management II
Registration #0910-404
Explores certain analytical models which can be used practically in an ordinary printing company. Includes such topics as decision theory, probability concepts, mathematical modeling, break-even and economic-order analysis under conditions of certainty and uncertainty, linear programming using computer, Markov chains, waiting line analysis, game theory, simulation. These topics are considered from conceptual and problem solving viewpoints without emphasis on mathematics beyond college algebra.

Class 4, Credit 4

PPRM-501 Financial Controls I
Registration #0910-501
Gives the line manager an understanding of the firm's financial accounting system so that he or she can work with the accountant to use that system effectively. Includes balance sheet, income, funds and cash statements, ratio analysis and asset vs. expense decisions.

Class 4, Credit 3

PPRM-502 Financial Controls II
Registration #0910-502
Cost accounting systems; measurement and allocation of manufacturing and non-manufacturing costs; uses of full cost information; differential accounting and alternative choice decisions; capital investment decisions; budget preparation, standard cost, variance analysis and the management control process. (PPRM-501)

Class 4, Credit 4

PPRM-503, 504 Statistics of Quality Control I, II
Registration #0910-503, -504
Fundamental concepts of statistics and the application of statistical methods to the control and investigation of processes and operations. (SMAM-201)

Class 4, Credit 4

PPRM-506 Business Law
Registration #0910-506
Elements of the laws of contracts, agency, sales, negotiable instruments, partnerships, corporations, taxes, insurance, libel, copyright, and other laws pertaining to business, printing and publishing.

Class 3, Credit 3

PPRM-507 Computer Estimating Workshop
Registration #0910-507
The design and writing of computer estimating algorithms; use of a full-scale computer estimating system; estimating for web-fed offset presses; estimating for non-lithographic printing processes; business forms and book manufacturing industries practices; addressing, mailing and order fulfillment; pre-planning and break-even analysis; techniques for competitive estimating and pricing. (PPRM-402 required)

Class 4, Credit 4

PPRM-509 Economics of Production Management
Registration #0910-509
Intended as a seminar in management for seniors, this course combines readings in managerial economics with case studies, most of which describe real printing company situations involving price, product or equipment decisions. Students analyze situations; prepare, present and defend arguments for specific courses of action. The student will find it helpful but not mandatory to have completed courses in Financial Controls I & II, Printing Production Management I & II, Principles of Economics.

Class 4, Credit 4

PPRM-510 Personnel Relations II
Registration #0910-510
Advanced study of employer-employee relationships, introduction to major management concepts as they relate to the printing field. Management functions and organization theory are considered in the light of behavioral science. Supervisory practices are analyzed. (PPRM-302)

Class 4, Credit 4

PPRM-511 Labor Relations in Graphic Arts
Registration #0910-511
History and background for organized labor movement; makeup and characteristics of the contemporary labor force; collective bargaining and its effects on wages, hours, and conditions of work; the process of negotiating, administering, interpreting, applying, and enforcing the labor-management contract within the graphic arts area of the modern industrial society.

Class 4, Credit 4

PPRM-512 Collective Bargaining in the Graphic Arts
Registration #0910-512
A study of the strategies and tactics of collective bargaining as applied to the graphic arts. Wage issues, fringe issues, and such concepts as seniority, discipline, grievance procedures, and managerial prerogatives are considered.

Class 3, Credit 3

PPRM-513 Sales In the Graphic Arts
Registration #0910-513
Explores economic, psychological and sociological bases of selling, with emphasis on customer and salesman interplay as well as techniques and practices of creative salesmanship in graphic arts companies. This course aims at benefiting both students considering a career in sales and those who will otherwise work with salesmen, either by supporting their company's salesmen in plant action or by buying from outside salesmen.

Class 4, Credit 4

PPRM-514 Newspaper Management
Registration #0910-514
Consideration of personnel, organization, finance, maintenance, advertising, circulation, and other sources of revenue as they pertain to the metropolitan press; problems and practices of plant supervision.

Class 4, Credit 4

PPRM-515 Legal Problems of Publishing
Registration #0910-515
Legal aspects of news gathering; freedom of the press; state and federal legislation; libel, privilege, obscenity, privacy, copyright, and laws applying to advertising, photography, and publishing.

Class 4, Credit 4

PPRM-516 Marketing in the
Registration #0910-516 Graphic Arts
Primarily from a printing industry viewpoint, the class explores the marketing concepts (organizing a team to find out what customers want to buy and then produce it at a profit). Students examine marketing functions and consider alternative ways to perform them in various company situations.

Class 4, Credit 4

PPRM-518 Purchasing in the Graphic Arts
Registration #0910-518
Role of the purchasing agent in the printing plant. Methods of procurement, purchasing policies and sources of supply. Characteristics of paper, ink, sensitized materials and other graphic arts supplies. Inventory control, economic order quantity, role of trade shops, make or buy decisions, blanket orders, consignment agreements, capital investment decisions and the purchase order as a legal document.

Class 4, Credit 3

PPRM-590 Senior Seminar
Registration #0910-590
Consideration of related graphic arts areas not normally covered in regular courses; investigation of recent and possible future developments in technology, management, and scientific applications, and their implications and probable effects on the industry.

Class 2, Credit 2

PPRM-599 Independent Study
Registration #0910-599
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 Printing. (Generally seniors with qualifying grade point average)

Credits 1 to 5

Technical Courses

PPRT-200 Introduction to Printing
Registration #0911-200
For packaging science students; study of different printing processes; analysis of process advantages and disadvantages relative to a variety of applications; examination of procedures for each process, from design through finished product; practice of basic operations necessary for the production of a simple package printing job.

Class 2, Lab. 3, Credit 3

PPRT-201 Typography I
Registration #0911-201
Conventional rules of good traditional typography are reviewed through familiarization with basic terminology, type classification and typeface recognition; course includes lectures and laboratory exercises on modern composing room procedures.

Class 2, Lab. 3, Credit 3

PPRT-202 Composition Technology
Registration #0911-202
A study of the use, operation, and application of machine principles and mechanisms as related to hot metal and phototypesetting; laboratory projects in setting composition photographically and in hot metal; utilization of various tape systems.

Class 2, Lab. 3, Credit 3

PPRT-203 Layout and Printing Design
Registration #0911-203
A comprehensive introduction of essential requirements and principles of layout and printing design as applied to commercial printing and advertising; practical application of design concepts in solving printing problems. Basic rendering skills are encouraged for model building, interrelationship of idea development, analyzing copy, logic of alphanumeric and related graphic images and copy preparation.

Class 2, Lab. 3, Credit 3

PPRT-204 Relief Press
Registration #0911-204
Theory and practice of letterpress presswork using platen and cylinder presses; techniques, mechanics of equipment, care of equipment and materials used; application of special techniques of letterpresses, diecutting, scoring, numbering, perforating, embossing; makeready methods for line and halftone printing; introduction to flexographic principles and practices used in the industry. Mounting and proofing of plates and pre-press preparation. Press operation and printing on a variety of substrates.

Class 2, Lab. 3, Credit 3

PPRT-205 Gravure Printing
Registration #0911-205
Introductory course designed to survey the gravure printing process and the study of related information regarding applications, techniques, equipment, materials and supplies. The course is conducted by means of lectures, class discussions, demonstrations and supervised laboratory exercises using a 4-color Champlain Web Press.

Class 2, Lab. 3, Credit 3

PPRT-206 Reproduction Photography
Registration #0911-206
A basic course in the fundamental principles, procedures, techniques, and applications of the photographic process as it is related to the production of film negatives or film positives for the major printing processes.

Class 2, Lab. 3, Credit 3

PPRT-207 Printing Plates
Registration #0911-207
Introductory course in the elements of platemaking procedures for letterpress, flexographic, and lithographic plates and gravure cylinders. Theoretical study plus practical involvement in making of various plates.

Class 2, Lab. 3, Credit 3

PPRT-208 Lithographic Press
Registration #0911-208
An introductory study of the principles and methods of offset presswork; press functions; operations and care of presses; exercise in running simple jobs.

Class 2, Lab. 3, Credit 3

PPRT-209 Screen Printing
Registration #0911-209
Theory and practice of screen printing covering areas such as preparation of positives, frames, fabrics, stretching of fabrics, stencil methods, fillers, squeegees, inks, presses, and dryers; experiences in printing of papers, plastics, and irregular shapes; a study of some of the economic aspects of screen printing and its place in the total concept of graphic arts.

Class 2, Lab. 3, Credit 3

PPRT-210 Newspaper Presses
Registration #0911-210
An introduction to major presses used to produce both weekly and daily newspapers. Letterpress and offset presses will be considered, along with gravure presses used for the production of newspaper supplements.

Class 2, Lab. 3, Credit 3

PPRT-213 Principles of Copy Preparation
Registration #0911-213
A basic course involving theory of camera copy requirements through lecture, examples and project work. Includes projects in black and white and color, register, veloxes, silhouettes cropping, "window," etc. Lectures cover all aspects of copy. Directed to those who do not require the depth of involvement given in PPRT 313.

Class 2, Lab. 2, Credit 3

PPRT-301 Typography II
Registration #0911-301
Emphasis is put upon finished typographic problems. Topics included in lectures are typographic movements, design concepts, analysis of current typographic practices, private presses, and bookmaking. The lab work is designed to present interesting and challenging problems to the serious student of typography. (PPRT-201)

Class 2, Lab. 6, Credit 4

PPRT-302 Composition Systems
Registration #0911-302
Detailed study of photocomposition with emphasis on systems approach; introduction to use of computers in composing rooms, and operation of specialized equipment. (PPRT-202)

Class 2, Lab. 3, Credit 3

PPRT-303 Layout and Printing Design
Registration #0911-303
Typical printing design problems with emphasis on typographic arrangements, pictorial arrangement with consideration of production follow-through. Includes design of complete booklet dummy and other commercial items for black-and-white and color reproduction from roughs to comprehensive layout.

Class 2, Lab. 6, Credit 4

PPRT-304 Advanced Relief Press
Registration #0911-304
A study of pressroom problems in letterpress printing on cylinder press equipment; commercial forms, single and multi-color work; makeready system; operation and care of equipment. (PPRT-204)

Class 2, Lab. 6, Credit 4

PPRT-306 Tone Reproduction Photography
Registration #0911-306
The photographic processes as they relate to the measurement and reproduction of tones for the major printing processes. The emphasis will be on the scientific analysis of a complete system of halftone sensitometry and process control. (PPRT-206)

Class 2, Lab. 3, Credit 3

PPRT-307 Lithographic Plates
Registration #0911-307
An advanced lithographic plate course covering the theory and practice of all types of litho plates; their processing, problems, control*. and applications in the industry. Included are related plate department operations such as step and repeat, and work with room-light-contact films.

Class 2, Lab. 3, Credit 3

PPRT-308 Lithographic Press Problems
Registration #0911-308
An advanced course in the theory, practice, and problems of offset presswork; development of technical knowledge of materials and equipment; practice in running multicolor work. (PPRT-208)

Class 2, Lab. 6, Credit 4

PPRT-309 Advanced Screen Printing
Registration #0911-309
Further study of the theory and practice of screen printing covering areas such as experiments with fabrics or screens; stencil forming materials and the effects these have on finished product. Further study into the inks and substrates that are common to the screen printer. Introduction to and running of automatic cylinder screen printing press and container press capable of printing cylindrical, conical and flat objects. (PPRT-209)

Class 2, Lab. 3, Credit 3

PPRT-310 Relief and Gravure Plates
Registration #0911-310
An introduction to the technological requirements involved in producing letterpress, flexographic and gravure plates. Chemical, mechanical, and electronic processes are discussed and illustrated in lecture. There is extensive project involvement in laboratory work on all plate systems.

Class 2, Lab. 3, Credit 3

PPRT-311 Imposition and Finishing
Registration #0911-311
Printing production planning to correlate pre-press and post-press operations. Topics include preparing layouts, forms and a study of how they are affected by various bindery operations. Laboratory experiments include the operation of modern bindery equipment, evaluation and application of adhesives, binding materials and book performance testing. Several projects are followed through from design, signature layout to a finished product, including a gold stamped, hardcover bound book.

Class 2, Lab. 3, Credit 3

PPRT-312 Stripping
Registration #0911-312
Study and practice of film-assembly and imposition of single, and complementary flats. Although negative film stripping of black and white line and halftone is emphasized, the course includes positive flat preparation, basic process color stripping and elementary step and repeat work. Several proofing materials are used as standard practice.

Class 2, Lab. 3, Credit 3

PPRT-313 . Copy Preparation
Registration #0911-313
Preparation of copy for camera; working from layouts, making analysis of requirements; paste-up techniques, methods of pre-separation mechanicals, use of photographic and typographic copy, relation to production steps in follow-up for offset platemaking and photo-engraving; proper instructional specification writing. (PPRT-203)

Class 2, Lab. 6, Credit 4

PPRT-314 Flexography
Registration #0911-314
A study of the theory and practice of flexographic printing; uses and development of flexography; plate and ink requirements; press principles and operation; experiments in printing on a wide variety of surfaces. (PPRT-204)

Class 2, Lab. 6, Credit 4

PPRT-315 Ink and Color
Registration #0911-315
Theory of light and color; basic theory of process color and correction; use of color comparator and spectrophotometer; the study of color systems and color matching systems; theory and application of various ink systems: practice in standard ink mixing and color matching emphasizing offset and letterpress processes; correlation of ink properties with applications: emphasis on relationship of ink to paper and press; study of ink problems and their correction.

Class 3, Lab. 2, Credit 4

PPRT-317 Calligraphic Forms
Registration #0911-317
An introduction to the basics of calligraphy; exercises in use of broad-edge pen to develop primary forms of italic and Chancery Cursive letter styles and skills in rapid writing; consideration of historical origins of letters, use of basic tools, understanding of methods and disciplines stressed.

Class 2, Lab. 3, Credit 3

PPRT-319 Newspaper Design
Registration #0911-319
A study of the methods of designing modern newspaper pages; a look at a variety of front page design methods as well as inside pages; placement of editorial content and ads; problems involved in designing section pages and special pages and editions; the standard format vs. the tabloid format; page sizes, column widths, and space between columns.

Class 2, Lab. 3, Credit 3

PPRT-320 Newspaper Production
Registration #0911-320
A study of the methods of producing a newspaper by the use of photocomposition systems and the offset process. Students organize a staff, design a newspaper, set type, paste up paper, go to camera, make plates and go to press.

Class 2, Lab. 3, Credit 3

PPRT-321 Web Offset
Registration #0911-321
An analytical study of the technological developments in web offset; emphasis on the interrelationship of procedures, materials, and equipment; practical laboratory projects on a commercial four-unit perfecting web offset press. (PPRT-208)

Class 2, Lab. 3, Credit 3

PPRT-322 Circulation and Mailrooms
Registration #0911-322
A study of the organization and functions of newspaper circulation departments. An overview of equipment and techniques used in modern newspaper mailrooms.

Class 3, Credit 3

PPRT-323 Newspaper Color
Registration #0911-323
A study of the basic theory, materials and methods used in the graphic arts for the reproduction of color for newsprint.

Class 2, Lab. 3, Credit 3

PPRT-324 Newspaper Composition
Registration #0911-324
A study of composition techniques used in the publishing of weekly and daily newspapers, with emphasis on the systems approach to newspaper production.

Class 2, Lab. 3, Credit 3

PPRT-329 Production Applications
Registration #0911-329 of Book Design
A course intended to give the student an understanding of how a book designer functions within a book publishing firm. Emphasis is placed upon the many factors involved in book design decisions, including the important relationship between book design and book production in producing a readable, functional book. (PPRT-301, PPRT-303, or instructor s approval)

Class 3, Credit 3

PPRT-330 Newspaper Production II
Registration #0911-330
The production of a newspaper by photocomposition methods and the offset process. A continuation of PPRT-320 Newspaper Production I in more depth, with special emphasis on presswork on the Goss Community Offset Press. Also, emphasis will be made on the use of color in newspaper production. (PPRT-320)

Class 2, Lab. 3, Credit 3

PPRT-401 Typographic Workshop
Registration #0911-401
Allows the student to create and solve a typographic problem of his own choice. Complete freedom is given and experimentation is encouraged, giving the student the opportunity to meet his own objectives and satisfaction.
The project or projects that the student chooses should be of significant interest to the student to warrant taking this course. (PPRT-301)

Class 2, Lab. 6, Credit 4

PPRT-402 Applications of Electronics to Graphic Arts
Registration #0911-402
A basic course in the fundamentals of electricity and electronics covering DC, AC and semiconductors. Theory and application are combined as major topics and studied implicating numerous graphic arts machines and devices. Students will perform laboratory experiments using basic electronic components and instruments

Class 2, Lab. 3, Credit 3

PPRT-403 Layout and Printing Design
Registration #0911-403
A project course with design problems which involves students in converting their designs into the actual camera copy, trying various media, learning to identify art techniques and printing processes; more individualized approaches emphasized, more advanced principles applied. (PPRT-303)

Class 2, Lab. 6, Credit 4

PPRT-406 Color Separation Photography
Registration #0911-406
Color separation and color correction methods in the graphic arts industry; color theory, masking requirements, tone reproduction for color, color proofing systems, electronic scanners.

Class 2, Lab. 3, Credit 3

PPRT-410 Introduction to Paper
Registration #0911-410
This course begins with a discussion of papermaking fibers, pulping procedures, papermaking machines, and proceeds to show how they affect paper properties and printing characteristics. Laboratory experiences include making paper from various raw materials, physical and optical testing of paper and paper identification.

Class 2, Lab. 3, Credit 3

PPRT-501 Development of Printing Types
Registration #0911-501
Present-day typefaces studied with relationship to their historical development and current use; type classification and nomenclature.

Class 3, Credit 3

PPRT-506 Advanced Color Reproduction
Registration #0911-506
Further study of color measurement and color reproduction. The emphasis will be on the analysis of a color reproduction system using such tools as color measurement instrumentation, visual color evaluation, color tone reproduction, and process control (PPRT-406)

Class 2, Lab. 3, Credit 3

PPRT-591 Reproduction Photography
Registration #0911-591
An intensive course designed to enable photography students to gain a basic understanding of the various printing processes, the application of photography to each, with an emphasis on problems involved in obtaining optimum tone and color reproduction of their photographs.

Class 2, Lab. 3, Credit 3

PPRT-592 Printing Plates
Registration #0911-592
A specialized course for photography students to develop understanding of various imaging methods and characteristics, processing steps, applications, and major problems of platemaking.

Class 2, Lab. 3, Credit 3

PPRT-593 Printing Presses
Registration #0911-593
Course offered for photography students; theory and practice of the methods of relief, planographic, flexographic and intaglio processes.

Class 2, Lab. 3, Credit 3

Graduate Courses
Master of Science in Printing

Printing Education

PPRE-701 Introduction to Graphic Arts Education
Registration #0908-701
A prerequisite course for most students working in the printing education major. A study of historical trends along with the development and overview of philosophy and methodology, including a survey of current industrial education teaching problems.

Credit 4

PPRE-702 Teaching Methods in Graphic Arts
Registration #0908-702 Education
The study of the criteria necessary for selecting the methods, procedures, and materials relevant to planning and executing an effective lecture or demonstration lesson.

Credit 4

PPRE-712 Lithographic Press Methodology
Registration #0908-712
A study of the principles, materials, and equipment used in lithographic presswork, set-up and operation of sheet-fed presses. An independent graduate research project is required.

Credit 4

PPRE-713 Typographical Procedures
Registration #0908-713
An introductory course in the basic tenents of traditional typography. Areas that will be covered are: terminology, style, copyfitting, point systems, legibility, initials and typeface recognition. Laboratory demonstrations will be given to illustrate the theoretical areas covered in the lectures.

Credit 4

PPRE-714 Color Separation Photography
Registration #0908-714
Color separation and color corrections: color theory, masking requirements, tone reproduction for color, color proofing systems, electronic scanner. An independent graduate research project is required.

Credit 4

PPRE-720 Photographic Reproduction
Registration #0908-720 Technology
The fundamental principles, procedures, techniques, and applications of the photographic process as it is related to the production of film negatives or film positives for the major printing processes. An independent graduate research project is required.

Credit 4

PPRE-721 Screen Printing
Registration #0908-721
Theory and practice of screen printing including preparation of positives, frames, fabrics, stretching of fabrics, stencil methods, fillers, squeegees, inks, presses, and dryers; experiences in printing of papers, plastics and irregular shapes. An independent graduate research project is required.

Credit 4

PPRE-860 Practice Teaching in the Graphic Arts
Registration #0908-860
A 10-week teaching experience in a school offering an appropriate exposure for the student teacher in the areas of student relationships and understanding, development of teaching methods and procedures, and a supervised involvement in the duties of the cooperating teacher.

Credit 12

Printing Management

PPRM-701 Computers in the Graphic Arts
Registration #0910-701
Introduction to basic computer characteristics; function of hardware components in relation to software requirements; discussion of computer languages as they relate to applications in printing. An independent graduate research project is required.

Credit 4

PPRM-702 Computers in Management
Registration #0910-702
Discussion of printing requirements in relation to computer system configurations; applications of computers to management and production control problems; investigation of computer-oriented production control techniques. (PPRM-701)

Credit 4

Printing Technology

PPRT-701 Research Methods in Graphic Arts
Registration #0911-701
Theory and application of principles of laboratory oriented research in the graphic arts, analysis of research techniques, interdisciplinary relationships, conditions for technology transfer and synergism; status of research in the graphic arts including organization, basic vs. applied research and organization of literature including patents, illustrations of techniques and research programs and methods followed in various research situations; systematic study theory of scientific methods including induction, deduction, hypothetico-deduction, hypothesis formation, theory development, etc.

Credit 4

PPRT-702 Graphic Reproduction Theory
Registration #0911-702
Analysis of the basic theories of graphic reproduction and study of the principles underlying prevalent and proposed printing processes; special topics such as classification and description of the various light-sensitive systems as applied to the graphic arts, ink transfer theory, present and proposed systems of printing based on electrostatics, electrolysis, magnetism and lasers; study of hybrid systems and the significance and application of interdisciplinary methods.

Credit 4

PPRT-703 Statistical Inference
Registration #0911-703
Descriptive statistics, patterns of variability, measures of variability, working with the normal curve, tests of hypotheses for means, tests of hypotheses for variance, internal estimates for means, internal estimates for variance, sample size for variables, introduction to analysis of variance, and applications of applied statistics to graphic arts.

Credit 5

PPRT-704 Design of Experiments
Registration #0911-704
Analysis of variance, components of variance, crossed vs. nested experiments, studying individual effects, introduction to matrix algebra, regression analysis, planning experiments from a statistical point of view, basic experimental designs, factorial experiments, fractional factorials, determination of optimum conditions, introduction to nonparametrics and quality control concepts (as time allows).

Credit 5

PPRT-705, 706, 707 Application of Mechanics and Electronics to
Registration #0911-705, -706, -707 Materials, Machine Design, and Processes in Printing
Force systems, elementary dynamics, work, power, energy, stress and strain, axial loads, beams, torsion bars, and columns, particularly as applicable to printing equipment and processes. Design of machine elements; bearings, gears, shafts, fasteners, and frames. Application of basic circuits to electronic devices and systems.

Credit 4/Qtr.

PPRT-708 Introduction to Systems Analysis
Registration #0911-708
Problems of systems analysis in printing operations for the highest quality product at the minimal cost including optimal floor designs and methods study. (PPRM-701)

Credit 4

PPRT-709 History of Printing Technology
Registration #0911-709
A study of the forces which have influenced the development of printing with emphasis upon the technological factors involved; examinations of the relationships of aesthetics and craft concepts to modern industrial techniques.

Credit 4

PPRT-710 Introduction to Paper
Registration #0911-710
A study of the interrelationships of paper, ink and printing processes; emphasis is placed upon physical and optical properties of paper, including the pulping and papermaking, paper testing and problem solving. An independent graduate research project is required.

Credit 4

PPRT-711 Tone and Color Analysis
Registration #0911-711
Methods of instrumentation necessary for the evaluation and process control of printed tone and color and the photographic intermediate images required for the photomechanical reproduction of tohe and color.

Credit 4

PPRT-712 Printing Plate Methodology
Registration #0911-712
Elements of platemaking procedures for letterpress, flexographic and lithographic plates, and gravure cylinders, theoretical study plus practical involvement in making of various plates. An independent graduate research project is required.

Credit 4

PPRT-714 Relief Press Methodology
Registration #0911-714
Theory and practice of letterpress presswork using platen and cylinder presses; techniques, mechanics of equipment, care of equipment and materials used; application of special techniques on letterpresses, die cutting, scoring, numbering, perforating, embossing; makeready methods for line and halftone printing; introduction to flexographic printing. An independent graduate research project is required.

Credit 4

PPRT-715 Gravure
Registration #0911-715
An introductory course designed to survey the gravure printing process and the study of related information regarding applications, techniques, equipment, materials and supplies. The course is conducted by means of lectures, class discussions, demonstrations and supervised laboratory exercises using a 4-color web press. An independent graduate research project is required.

Credit 4

PPRT-716 Layout and Printing Design
Registration #0911-716
A comprehensive introduction of essential requirements and principles of layout and printing design as applied to commercial printing and advertising; practical application of design concepts in solving printing problems. Basic rendering skills are encouraged for model building, interrelationship of idea development, analyzing copy, logic of alphanumeric and related graphic images and copy preparation. An independent graduate library research paper or project is required.

Credit 4

PPRT-717 Copy Preparation
Registration #0911-717
Preparation of copy for camera; working from layouts, making analysis of requirements; paste-up techniques, methods of pre-separation mechanicals, use of photographic and typographic copy, relation to production steps in follow-up for offset platemaking and photoengraving; proper instructional specification writing. An independent graduate project is required.

Credit 4

PPRT-718 Imposition and Finishing Procedures
Registration #0911-718
Printing production planning to correlate pre-press and post-press operations. Topics include preparing layouts, forms and a study of how they are affected by various bindery operations. Laboratory experiments include the operation of modern bindery equipment evaluation and application of adhesives, binding materials and book performance testing. Several projects are followed through from design, signature layout to a finished product, including a gold-stamped, hardcover bound book. An independent graduate research project is required.

Credit 4

PPRT-719 Photocomposition
Registration #0911-719
Emphasis on use and operation of composing machines; introduction to use of computers in printing; operation and application of photocomposition; practice on specialized equipment. An independent graduate research project is required.

Credit 4

PPRT-720 Ink and Color
Registration #0911-720
Theory of light and color; basic theory of process color and correction; use of color comparator and spectrophotometer; The study of color systems and color matching systems; theory and application of various ink systems; practice in standard ink-mixing and color matching emphasizing offset and letterpress processes; correlation of ink properties with applications, emphasis on relationships of ink to paper and press; study of ink problems and their correction. An independent graduate research project is required.

Credit 4

PPRT-850 Research Projects
Registration #0911-850
Individual research projects in which independent data is collected by the student, followed by analysis and evaluation. A comprehensive written report is required. Consent of adviser required.

Credit variable

PPRT-890 Research and Thesis Guidance
Registration #0911-890
An experimental survey of a problem area in the graphic arts.

Credit variable

College of Science

SSEG-201 Contemporary Science—Biology
Registration #1018-201
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. (F, W, S)

Class 4, Credit 4

SSEG-202 Contemporary Science—Chemistry
Registration #1018-202
The overall intent of this course is to relate the important role of chemistry to issues of immediate and contemporary concern. Basic chemistry principles are discussed qualitatively and then applied to environmental concerns, energy, pesticides, food and drugs, and the properties of polymers. Lap-dissolve projection, current films and invited speakers are integrated into the lecture schedule. (F, W, S)

Class 4, Credit 4

SSEG-203 Contemporary Science—Physics
Registration #1018-203
Introductory science for non-science students. Several topics such as space exploration, relativity, nuclear energy, and lasers are discussed and explained simply, 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 is offered for the small-group meetings once a week, which reinforce the material given in demonstration lectures and audiovisual presentations. (F, W, S)

Class 4, Credit 4

SSEG-204 Contemporary Science—Mathematics
Registration #1018-204
A basic survey of mathematical structures as well as an introduction to problem solving. Topics will be chosen from foundations of mathematics, algebra, topology, number theory, graph theory, and probability theory. These structures will be examined as they occur naturally in modern settings. (F, W, S)

Class 4, Credit 4

NO TE: From time to time special courses may be ottered in the Contemporary Sciences series, e.g., Environmental Geology, Oceanography, etc.

NOTE: Quarter ottered follows course description in parentheses; F-Fall; W-Winter; S-Spring; SR-Summer.

Biology

SB IB-550 Biology Seminar
Registration #1001-550
Written and oral reports and their discussion by class members covering topics of current interest in the biological sciences. (W, S)

Class 2, Credit 2

SBIB-559 Special Topics—Biology
Registration #1001-559
Advanced 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 specified prerequisites, contact hours, and examination procedures. (Offered every quarter)

Class variable, Credit variable

SBIB-599 Independent Study—Biology
Registration #1001-599
Faculty directed study of appropriate topics on a tutorial basis. This course will generally be used to enable an individual to pursue studies of existing knowledge available in the literature. (Offered every quarter.)

Class variable, Credit variable.

Molecular & Cellular Biology

SBIC-320 Histology
Registration #1002-320
Detailed study of the structure and function of normal and abnormal vertebrate tissue (SBIG-201) (W)

Class 2, Lab. 4, Credit 4

SBIC-401 Immunohematology
Registration #1002-401
Composition of blood, blood groups, and the chemistry and immunology of blood-like substances. Chemical genetics of blood groups with reference to practical applications in hospital procedures. Antigen-antibody reactions and compatibility of blood groups will be emphasized in the laboratory. (F)

Class 3, Lab. 3, Credit 4

SBiC-402 Immunology
Registration #1002-402
Fundamental study of nature of antigens and antibodies, the mechanisms of agglutination, precipitation, complement fixation, anaphylaxis; the theoretical and practical aspects of the immune response, immunological tolerance, and allergic reaction. Laboratory work: preparation, standardization, and assays of antigens and antibodies. (F)

Class 2, Lab. 3, Credit 3

SBIC-403 Cell Physiology
Registration #1002-403
An in-depth study of the structure and physiology of membrane bound organelles, molecular genetics, and the biochemistry of genetic events. (SBID-421, SCHO-232) (F- alternate years)

Class 3, Lab. 3, Credit 4

SBIC-404 Introductory Microbiology
Registration #1002-404
Principles of anatomy, biochemistry, genetics, taxonomy, ecology of viruses, bacteria, molds, algae, and protozoa. Useful and harmful activities. Basic laboratory techniques, microscopy, staining, counting, identifying. (SBIG-201) (F)

Class 3, Lab. 4, Credit 5

SBIC-405 Medical Microbiology
Registration #1002-405
Pathogenic micro-organisms, host-parasite relationships, epidemiology, public health, virology, pathogenic molds, principles of immunology. Advanced laboratory techniques, anaerobiosis, assays, quant, tests, isolating and identifying pathogens. (SBIC-404) (W)

Class 3, Lab. 3, Credit 4

SBIC-406 Virology
Registration #1002-406
Molecular biology, chemistry, epidemiology and clinical aspects of viruses: morphology, genetics, immunology, environmental effects; methods of isolation, cultivation, identification; assays. Human virus diseases. (W)

Class 4 Credit 4

SBIC-408 Immunobiology
Registration #1002-408
An investigation of the development of an immune response in laboratory animals using a wide variety of methods. Each student follows an immune response in a group of animals during the quarter. (SBIC-402) (W-alternate years)

Class 1, Lab. 6, Credit 3

SBIC-409 Plant Anatomy
Registration #1002-409
A detailed study of the cellular structure and development of plant tissues and organs. (SBIG-201, SBIG-202, SBIG-203) (W-alternate years)

Class 3, Lab. 3, Credit 4

SBIC-410 Hematology
Registration #1002-410
Descriptions of normal and abnormal human red and white blood cells. Study of the structure of hemoglobin, chemical and physical properties of blood cells, hemostasis, and coagulation mechanisms. Laboratory testing procedures used for the diagnosis of anemias, leukemias, and coagulation disorders. (SBIG-203) (S)

Class 3, Lab. 3, Credit 4

Developmental, Genetic & Environmental Biology

SBID-340 General Ecology
Registration #1003-340
Introduction to ecosystem ecology stressing the dynamic interrelationships of plant aad animal communities with their environments. A study to include such ecological factors as energy flow and trophic levels in natural communities, plant responses and animal behavior, population dynamics, biogeography and representative ecosystems. (SBIG-203) (F)

Class 3, Lab. 3, Credit 4

SBID-420 Plant Ecology
Registration #1003-420
A consideration of the nature and variation of plant communities with a discussion of factors which limit, maintain, and modify communities both locally and regionally. Field studies of various plant communities will be conducted. (SBIG-203, SBID-240) (S-alternate years)

Class 3, Lab. 3, Credit 4

SBID-421 Genetics
Registration #1003-421
Genes and cytoplasmic factors as units of inheritance; the nature and origin of inheritable characteristics and variations. Principles of inheritance in plants, animals, and humans. (SBIG-202, -203) (S)

Class 3, Lab. 3, Credit 4

SBID-422 Developmental Biology
Registration #1003-422
Study of the processes of growth, differentiation and development which lead to the mature form of an organism. Both plant and animal systems are considered. (SBIG-203) (W)

Class 2, Lab. 6, Credit 4

General Biology

SBIG-201, 202, 203 General Biology
Registration #1004-201, -202, -203
Basic principles of modern cellular biology including cell structures and the materials which make up cells; physiological processes and their mechanisms in cellular functions; principles of genetics and evolution; organic systems; principles of ecology. The three quarters may be taken in any sequence. No prerequisite is needed for any sequence of the course. (201-F, SFt; 202-W, SR; 203-S, SR) (Corequisite SBIG-205, -206, -207)

Class 3, Lab. 3, Credit 4

SBIG-204 Communication Skills for the
Registration #1004-204 Biological Sciences
Designed to increase skill in recording, describing, and interpreting biological procedures, observations, and concepts. Emphasis will be placed on clarity and precision of expression as well as principles of good English. (W)

Class 1, Credit 1

SBIG-205, 206, 207 General Biology Laboratory
Registration #1004-205, -206, -207
Laboratory work to complement the lecture material of General Biology (SBIG-201, 202, 203). The experiments are designed to illustrate concepts, develop laboratory skills and techniques, and improve ability to make, record, and interpret observations. (Corequisite SBIG-201, -202, -203) (F-205, W-206, S-207)

Lab. 3, Credit 1

SBIG-210** Microbiology in Health and Disease
Registration #1004-210
An introduction to microorganisms, their relationship to the environment and human health, and the causes, prevention and treatment of infectious diseases.

Class 3/4, Credit 3/4

SBIG-211** Human Biology
Registration #1004-211
An introduction to the structure and function of the human body. (W)

Class 4, Credit 4

SBIG-213** Biology of Human Reproduction
Registration #1004-213
The study of the anatomy, functioning and diseases of the human reproductive systems. An introduction to human heredity, inherited diseases, and birth defects. (F)

Class 4, Credit 4

SBIG-220** Microbiology in Health and Disease
Registration #1004-220 Laboratory
Laboratory culturing, handling and identification of microorganisms with special emphasis on the relationship of bacteria to food handling and preservation, the production of food products by bacteria, and the prevention of food-borne diseases.

Lab. 3, Credit 1

SBIG-221** Cell Biology
Registration #1004-221
The basic structure and functioning of the cell, including ultrastructure, metabolism, reproduction, and cellular interaction. (F)

Class 3, Lab. 3, Credit 4

SBIG-311 Introduction to Pathology
Registration #1004-311
An introduction to the terminology and concepts of the pathophysiological nature of diseases and the clinical and laboratory methods used in diagnosis of diseases. (SBIG-201, -202 or 210,211) (S) '

Class 3, Credit 3

SBIG-315** Medical Genetics
Registration #1004-315
A survey of selected human variations and diseases of medical importance, with emphasis on the underlying genetic principles (SBIG-203, or equivalent) (W).

Class 2, Credit 2

SBIG-440** Environmental Microbiology
Registration #1004-440
Micro-organisms in water and sewage, biological and medical aspects. Methods for detection, isolation, and enumeration. Treatment methods for eliminating and controlling harmful organisms. (S, SR)

Class 3, Lab. 2, Credit 4

Organismal Biology

SBIO-301 Invertebrate Zoology
Registration #1006-301
Biology of invertebrate animals with reference to classification, structure, function, and ecology. (F)

Class 3, Lab. 3, Credit 4

SBIO-302 Vertebrate Zoology
Registration #1006-302
Morphology, physiology, behavior classification, and ecology of chordates. (W)

Class 3, Lab. 3, Credit 4

"Not acceptable for biology credit for biology majors.

SBIO-303 Comparative Vertebrate Anatomy
Registration #1006-303
A comparative study of the organ systems of representative members of the vertebrates with emphasis on structural changes which occur during evolution. (Minimum of 8 credits in biological science.) (S)

Class 3, Lab. 3, Credit 4

SBIO-304 Botany
Registration #1006-304
Distribution of the major groups of plants and their adaptation to their particular environment. (W)

Class 3, Lab. 3, Credit 4

SBIO-305, 306 Physiology and Anatotny
Registration #1006-305, -306
Cellular make-up of the body and aggregation into functional units. Tissues, organs, and systems and their relationship in terms of their structure and function. (SBIG-201, -202, SCHG-217) (305-W, 206-S)

Class 3, Lab. 3, Credit 4

SBIO-410 Plant Physiology
Registration #1006-410
Physiological phenomena in the growth and development of higher plants. Water relationships, photosynthesis, tran§location, mineral nutrition, growth, hormonal control and reproduction. (Minimum of 10 credits in biological science.) (S-alternate years)

Class 3, Lab. 3, Credit 4

SB 10-411 Systematic Botany
Registration #1006-411
Study of diversity existing in vascular plants, its origin and its organization into a heirarchy of categories, orders, and families. Laboratory experience in collection, identification, and study of vascular plants with special emphasis on local flora. Practice in use of manuals and interpretation of morphological characters. (SBIO-304) (S-alternate years)

Class 3, Lab. 6, Credit 4

SBIO-412 Parasitology
Registration #1006-412
Structure, life cycle, and control of human parasites. Emphasis on forms of diagnostic importance. (Minimum of 10 credits in biological science.) (S)

Class 3, Lab. 3, Credit 4

SBIO-413 Comparative Animal Physiology
Registration #1006-413
A comparative study of the physiological mechanisms of the animal kingdom. An interpretation of the physiological variations in terms of evolutionary significance, morphological variation and ecological conditions. (SBIG-201, 202) (F)

Class 3, Lab. 3, Credit 4

SBIO-620 Introduction to Pharmacology
Registration #1006-620
The chemical properties, metabolism and excretion of drugs and their effects on physiological systems such as cardiovascular, renal, gastro-intestinal, respiratory, endocrine, and central nervous systems. Antimicrobial and cancer chemotherapeutic agents will also be discussed. (SBIO-305, 306 and permission of the instructor) (F)

Class 3, Lab. 3, Credit 4

SBIO-705 Advanced Physiology
Registration #1006-705
An in-depth study of the functions of the human body. Both the chemical and physical factors of normal physiology will be studied along with the modified functions that are a result of disease. (SBIO-305, 306, SCHB-602, 603) (S)

Class 3, Credit 3

Biological Techniques

SBIT-320 Small Animal Surgery
Registration #1007-320
A course designed to prepare the student for small animal handling, biological administrations and preparations, minor surgery and autopsies. (SBIG-201, 202, or permission of the instructor). (W)

Class 1, Lab. 3, Credit 2

SB IT-430 Radiation Biology
Registration #1007-430
Effects of radiation upon living tissue, both harmful and beneficial. Morphological changes, genetic effects, and pathological changes in both plant and animal tissues. Use of radioisotopes in plant and animal research. (Minimum of 20 credits in biological science.) (F)

Class 2, Lab. 6, Credit 4

SBIT-431 Histological Technique
Registration #1007-431
Preparation of plant and animal tissues for slide mounts. Techniques in paraffin and frozen sectioning. Sectioning on the rotary and sliding microtomes and multiple staining techniques. (SBIG-201) (S)

Class 1, Lab. 4, Credit 3

SBIT-432, 433 Biology Laboratory Techniques
Registration #1007-432, -433
Instrumental and experimental methods of analysis of biological material. The first quarter stresses the principles of laboratory instruments, which include photometry, fluorometry, electrophoresis, chromatography, and radioactive particle counters. The second quarter is devoted to applications in the clinical laboratory. (432-F, W, 433-S)

Class 2, Lab. 6, Credit 4

SBIT-470 Advanced Radiation Biology
Registration #1007-470
A study of the biological effects of ionizing radiation, and uses in the medical and biological laboratories. Emphasis will be placed upon dosages and responses. (SPSP-351 or SBIT-430) (S)

Class 3, Lab. 3, Credit 4

SBIT-541, 542, 543 Biology Research
Registration #1007-541, -542, -543
Faculty directed student projects or research usually involving original laboratory work and/or calculations over a period of at least two quarters.

Class variable, Credit variable

SBIT-770 Introduction to Electron Microscopy
Registration #1007-770
An introduction to the theory and practice of electron microscopy. Laboratory experience includes fixation, staining, sectioning, and mounting of selected tissue samples as well as operation and maintainence of a medium resolution electron microscope. (Offered upon sufficient request)

Class 1, Lab. 6, Credit 3

Chemistry

SCHA-261, 262, 263 Introduction to
Registration #1008-261, -262, -263 Chemical Analysis
An introduction to qualitative and quantitative analysis. Introduction to the chemistry of inorganic ions by qualitative analysis. Classical methods of gravi metric analysis and titration analysis based on acid-base, precipitation, oxidation-reduction and complex formation as well as non-aqueous solvent acid-base reactions, introduction to electro-chemical techniques, and fundamentals of spectroscopy are stressed. Equilibrium concepts and statistical evaluation of results are incorporated. (261-F, 262-W, 263-S)

Class 2, Lab. 5, Credit 3

SCHA-311 Analytical Chemistry—Instrumental Analysis
Registration #1008-311
Elementary treatment of instrumental theory and techniques, properties of light; refractive index; ultraviolet, visible and infrared spectrophotometry; emission spectroscopy; flame photometry; electrochemistry; Nernst Law; pH meters and electrodes (SCHC-212) (F)

Class 3, Lab. 4, Credit 4

SCHA-312 Analytical Chemistry—Separations
Registration #1008-312
Inorganic and organic separations; Raoult and Henry Laws; phase rules; distillation; extraction; adsorption and surface effects; electrophoresis, chromatography including gas, liquid, column, paper, thin layer, and ion exchange. (SCHC-212) (W)

Class 3, Lab. 4, Credit 4

SCHA-711 Instrumental Analysis
Registration #1008-711
Principles of and instrumentation for: CW and FT NMR spectroscopy; magnetic deflection and quadrupole mass spectroscopy; DC pulse cyclic and anodic stripping voltammetry; amperometric titrations; specific ion electrodes; computer control of instruments

Lee. 3, Credit 3

SCHA-720 Instrumental Analysis Laboratory
Registration #1008-720
^{1}H and ^{13}C NMR Spectroscopy; mass spectrometry; voltammetry; coulometry; potentiometry; amperometry computer interfacing with experiments.

Lab. 5, Credit 2

SCHB-702 Biochemistry
Registration #1009-702
Introduction to biological chemistry. Chemical structures, reactions and physiological functions of molecular components of cells: amino acids, sugars, lipids, nucleotides and selected biopolymers. Solution behavior, catalytic properties and structure of proteins and enzymes. (SCHO-232, SCHP-433) (SR, F)

Class 3, Credit 3

SCHB-703 Biochemistry—Metabolism
Registration #1009-703
Bioenergetics principles; catabolism of carbohydrates, fatty acids and amino acids: photosynthesis, biosynthesis of carbohydrates, lipids, and nitrogenous compounds; active transport; metabolic diseases. (SCHB-702) (W)

Class 3, Credit 3

SCHB-704 Biochemistry—Nucleic Acids &
Registration #1009-704 Molecular Genetics
The biochemistry of inheritance, expression of genetic information, protein biosynthesis, differentiation, viral and bacterial infection and the “origin of life." (SCHG-702) (S)

Class 3, Credit 3

SCHB-605, 606 Biochemistry—Case Studies
Registration #1009-605, -606
Biological and clinical case studies of biochemistry. The cases are arranged to be correlated with the lecture topics of Biochemistry, SCHB-702, 703. (Concurrent registration in SCHB-702, 703) (605-F, 606-W)

Class 1, Credit-1

SCHC-201 Chemical Literature
Registration #1010-201
A survey of the techniques used to monitor the chemical literature. Chemical Abstracts, Science Citation index and Beilstern are covered. Technical writing is required. The structure and development of journals, theses, monographs, reviews and textbooks are covered. (SCHC-211, -212) (S)

Class 2, Credit 2

SCHC-211,212 General Chemistry
Registration #1010-211, -212
For science and photoscience majors and others who desire an in-depth study of general chemistry. Atomic structure and chemical bonding; thermodynamics and equilibrium; chemical equations and chemical analysis; gases; acids and bases; oxidation-reduction; chemical kinetics. Course stresses problem solving applications of chemical principles. (211 -F, 212-W)

Class 3, Credit 3

SCHC-402 Introduction to Research
Registration #1010-402
Introduction to laboratory research projects of interest to chemistry faculty members. Students desiring to pursue active undergraduate research will investigate research opportunities with faculty members. Preparation and presentation of a research proposal in this course is a prerequisite to participation in research. (SCHO-431, SCHP-441) (F, W)

Class 1, Credit 0

SCHC-541, 542, 543 Chemistry Research
Registration #1010-541, -542, -543
Faculty directed student projects or research usually involving laboratory work and/or calculations that could be considered of an original nature. (SCHC-402) (F,W,S,SR).

Class variable, Credit variable

SCHC-599 Independent Study—Chemistry
Registration #1010-699
Faculty directed study of appropriate topics on a tutorial basis. This course will generally be used to enable an individual to pursue studies of existing knowledge available in the literature.

Class variable, Credit variable

SCHC-772 Special Topics—Chemistry
Registration #1010-772
Advanced courses which are of current interest and/or logical continuations of the courses already being offered. These courses should be structured as ordinary courses and should have specified prerequisites, contact hours, and examination procedures.

Class variable, Credit variable

SCHG-201 General Chemistry
Registration #1011-201
One quarter survey of general chemistry for non-science majors, e.g., Dietetics and other Health Related Professions majors. (F)

Class 3, Credit 3

SCHG-202 Organic Chemistry
Registration # 1011-202
One quarter survey of the fundamentals of organic chemistry that are essential to an understanding of biological molecules and biochemistry. (W)

Class 3, Credit 3

SCHG-203, 204 Biochemistry
Registration #1011-203, -204
A two quarter survey of biochemistry for non-science majors, e.g., Dietetics and other Health Related Professions majors. (SCHG-202) (S)

Lee. 3, Rec. 1, Credit 4

SCHG-205, 206, 207 Chemical Principles Laboratory
Registration #1011-205, -206, -207
A laboratory course for photoscience, mathematics, and physics majors who are taking general chemistry (SCHC-211, 212) and Introduction to Organic Chemistry (SCHO-230) concurrently. Laboratory experiments are designed to complement the lecture material in these courses. (205-F, 206-W, 207-S)

Lab. 3, Credit 1

SCHG-208, 209 College Chemistry
Registration #1011-208, -209
For engineering students. The concepts of energy and the work function is discussed in terms of industrial chemical processes. Topics include applications of the gas laws, equilibrium theory, nuclear and electrochemistry, thermodynamics, and modern instrumental methods of structure analysis. Students will have two lectures and one recitation period per week. One additional lecture period is scheduled for chemistry demonstration material, problem review and simulated laboratory experiments. (208-F, 209-S)

Class 4, Credit 4

SCHG-211 General Chemistry Laboratory
Registration #1011-211
Laboratory course to accompany SCHG-201. Emphasis on introduction to methods of chemical analysis, qualitative and quantative techniques. (F)

Lab. 3, Credit 1

SCHG-212 Organic Chemistry Laboratory
Registration #1011-212
Laboratory course to accompany SCHG-202. Emphasis is on representative examples of typical organic techniques and syntheses. (W)

Lab. 3, Credit 1

SCHG-215, 216, 217 General and Analytical Chemistry
Registration #1011-215, -216, -217
Principles of chemistry presented for students in medical technology and the life sciences. (215-F, 216-W, 217-S)

Class 3, Credit 3

SCHG-225, 226, 227 General and Analytical
Registration #1011-225, -226, -227 Chemistry Laboratory
Laboratory sequence to accompany SCHG-215, 216, 217. Experiments in inorganic chemistry, separation techniques and quantitative analysis. (225-F, Lab. 3, Credit 1) (226-W, Lab. 3, Credit 1) (227-S, Lab. 6, Credit 2)

SCHG-271 Chemistry of Water
Registration #1011-271
Basic training in general chemistry assuming no prior experience, concentrating on those aspects important in the field of water conservation. Laboratory work trains the student in volumetric analysis. (F, W)

Class 2, Lab. 3, Credit 3

SCHG-272 Chemistry of Water
Registration #1011-272
Chemistry of organics, metals, construction materials, radioactive and other environmental pollutants, and other substances related to water analysis. Laboratory practice in water analysis, including use of instrumentation. (S, SR)

Class 2, Lab. 3, Credit 3

SCHG-281, 282, 283 General Chemistry
Registration #1011-281, -282, -283
For printing students. Aspects of general chemistry of widest applicability to graphic arts technology; first quarter includes definitions of terms, basic concepts and laws; second quarter devoted to properties of solutions and organic materials; third quarter deals with applications in ink, paper, photo-lithographic processes and other topics as time allows. (28.1 -F, 282-W, 283-S)

Class 3, Lab. 2, Credit 4

SCHI-762, 763 Inorganic Chemistry
Registration #1012-762, -763
The properties and structures of the elements and their compounds in relation to electronic and stereo-chemical principles. (SCHO-433, SC HP-443) (762-S, SR; 763-F, W)

Class 3, Credit 3

SCHO-230 Introduction to Organic Chemistry
Registration #1013-230
Introduction to the structure and reactivities of organic molecules for physical science majors. An overview of the structure, nomenclature, bonding, and reactivity of the various functional groups. Chemistry of alkenes, alkynes, and aromatic molecules. (SCHC-212 or permission of instructor) (S)

Credit 3, Class 3

SCHO-231, 232 Organic Chemistry
Registration #1012-231, -232
Types of organic compounds, names, and structures, preparations, properties, and reactions. Laboratory work emphasizes techniques; involves preparations and analysis. (SCHG-216 or SCHC-212) (231-F, 232-W)

Class 3, Lab. 3, Credit 4

SCHO-233 Organic Chemistry
Registration #1013-233
Chemistry of the major classes of compounds of direct biological significance: carbohydrates, proteins, nitrogen heterocycles. Basic mechanisms of organic reactions and methods of elucidation, including spectrophotometry. (SCHO-232) (S)

Class 3, Lab. 3, Credit 4

SCHO-431, 432, 433 Organic Chemistry
Registration #1013-431, -432, -433
A rigorous survey of the reactions of all major functional groups. Conformational Analysis, Stereochemistry and Spectral (IR, NMR) analysis are also covered. Prior coursework in Organic Chemistry is required. (SCHO-230 or its equivalent) (431 -S, SR, 432-F, W) (433-S, SR)

Class 2, Credit 2

SCHO-435, 436 Preparative Organic Chemistry
Registration #1013-435, 436
Synthesis of Organic Compound utilizing a variety of laboratory techniques. Purification and Spectral Characterization will be routinely used. (SCHO-230). (SCHO-431 should be taken concurrently with SCHO-435 and SCHO-432 with SCHO-436).

Lab. 6, Credit 2

SCHO-437 Systematic Identification of Organic
Registration #1013-437 Compounds
A laboratory course utilizing chemical and spectural (largely IR and NMR) techniques to identify and characterize organic compounds. (SCHO-432, 436) (SCHO-433 should be taken concurrently) (437-S, SR)

Lab. 6, Credit 2 |

SCHO-737 Advanced Organic Chemistry
Registration #1013-737
Several of the following advanced topics in organic chemistry are covered: polyfunctional compounds, modern synthetic methods, stereochemistry, conformational analysis, free radical reactions, natural and synthetic polymers. (SCHO-433) (Offered upon sufficient request)

Class 3, Credit 3

SCHO-739 Advanced Organic Chemistry
Registration #1013-739
Topics include activation parameters, kinetic and non-kinetic treatment of mechanism elucidation, linear free energy concepts, quantitative analysis of conformational and electronic effects, simple Huckel Molecular Orbital Theory, electrocyclic reactions, acidity functions, and primary and secondary isotope effects. (SCHO-433, SCHP-443) (Note: SCHO-737 recommended but not required) (Offered upon sufficient request)

Class 3, Credit 3

SCHO-736 Spectrometric Chemical Identification
Registration #1013-736 of Organic Compounds
The theory and application of nuclear magnetic resonance, infrared, mass spectrometry, and ultraviolet spectra as applied to organic structure determination are covered in this course. (SCHO-433)

Class 2, Credit 2

SCHO-738 Advanced Organic Qualitative Analysis
Registration #1013-738
A laboratory course utilizing chemical and spectral (largely IR and NMR) analysis for the identification of complex organic compounds. (738-S, SR)

Lab. 6, Credit 2

SCHP-340 Introduction to Physical Chemistry
Registration #1014-340
Properties of gases, kinetic molecular theory; Boltzmann distribution functions; non-ideal behavior; first law of thermodynamics; heat capacities. Euler's theorem and homogeneous functions; thermochemistry; and introduction to the second law. (SCHC-213) (S)

Class 3; Lab. 3, Credit 4

SCHP-441, 442, 443 **Physical Chemistry**
Registration #1014-441, -442, -443

Atomic theory, states of matter, chemical thermodynamics, molecular properties, solutions, equilibria, phase rule, electrochemistry, kinetics, surface chemistry, and photochemistry, (SCHP-340, SPSP-311) (441-F, W, 442-S, SR; 443-F, W)

Class 3, Lab. 3, Credit 4

SCHP-741 **Chemical Thermodynamics**
Registration #1014-741

A study of the basic fundamentals of thermodynamics and their use in deriving the interrelationships of thermodynamic functions. Applications to thermochemistry, chemical and phase equilibria are made. (SCHP-443, SMAM-307) (Offered upon sufficient request.

Class 3, Credit 3

SCHP-742 **Survey of Physical Chemistry**
Registration #1014-742

This course will present the elements of physical chemistry to students whose interests are in those areas (such as biology, health related professions, printing, photography, etc.) in which they may have had a minimal exposure to physical chemistry. Molecular structure, thermodynamics, and kinetics will be discussed with a minimum of mathematics. (SCHG-215, 216, 217, SCHO-231, 232 or consent of instructor) (W)

SCHP-747 **Principles of Magnetic Resonance**
Registration #1014-747

A development of the principal ideas of magnetic resonance including the theory of resonance line-shapes, magnetic interactions, experimental considerations, and spectral analysis. These concepts are discussed in terms of nuclear magnetic, nuclear quadrupole, and electron spin resonance spectroscopy, and no previous knowledge of the subject material is assumed. (SCHP-443, SMAM-307) (Offered upon sufficient request)

Class 3, Credit 3

SCHT-241 **Chem Tec I (General)**
Registration #1015-241

Safety in the chemical laboratory, toxicity of chemicals, use of compressed gases, laboratory notebooks, separation techniques, paper and gas chromatography, properties of gases and their measurement, common units and conversion factors, weighing techniques, density of solids and liquids, chemical equilibrium, visible spectrophotometry, ionic and covalent bonding. (F)

Class 3, Lab. 9, Credit 6

SCHT-242 **Chem Tec II (Analytical)**
Registration #1015-242

Periodicity and chemical properties. Qualitative detection of common metallic and non-metallic ions. Sampling techniques and sample preparation. Quantitative analysis by gravimetric and titrimetric procedures—acid base and redox. Measurement of pH. (W, S)

Class 3, Lab. 9, Credit 6

SCHT-243 **Chem Tec III (Organic)**
Registration #1015-243

Techniques of handling organic compounds; recrystallization and melting points, distillation, extraction. Refractive index and optical activity. Reactions of functional group classes. Infra-red spectrophotometry. (SR, F)

Class 3, Lab 9, Credit 6

SCHT-244 **Chem Tec IV (Organic)**
Registration #1015-244

Continuation of classes and reactions of organic compounds. Synthetic techniques, vacuum distillation, gas chromatography. (W, S)

Class 2, Lab 9, Credit 5

SCHT-305 **Chemical Specialty (Spectrometry)**
Registration #1015-305

Quantitative analysis including trace analysis by spectrometric methods involving visible, infra-red, ultra-violet and atomic absorbtion. Techniques of sample preparation, spectral scanning and measurement using a variety of instruments. Interpretation of spectra. (SR, F)

Class 2, Lab. 6, Credit 4

SCHT-306 **Chemistry Speciality**

Registration #1015-306

The final academic quarter of the Chem Tec curriculum is designed so that students are given the opportunity to develop more definite options as to their own individual goals. The student may elect to branch-off into one of three areas of specialization; advanced instrumental techniques, the development of synthetic techniques in organic chemistry and polymer technology. (W, S)

Class 2, Lab. 6, Credit 4

SCHT-307, -308 **Research Familiarization**
Registration #1015-307, -308

A chemical technician does exploratory work following general directions with little or no formal supervision and is often encouraged to innovate after consultation with his or her supervising chemist or engineer. In this context each student will have the opportunity to work alongside one of our faculty or graduate students and perform a number of tasks related to the progress of a research operation. The choice of a faculty supervisor is left to the student. (307-F, SR)

Credit variable

SCHT-309 **Glassblowing Techniques**

Registration #1015-309

This course is designed to introduce and train each student in small scale scientific glassblowing techniques. Proficiency will be developed in rod manipulation, ring seals, construction of apparatus annealing, use of a simple lathe and hand-torch work. (F, SR)

Lab. 4, Credit 2

Graduate Courses
Master of Science in Chemistry and Master of Science in Clinical Chemistry

SCHA-711 **Instrumental Analysis**
Registration #1008-711

Theory, applications and limitations of instrumental methods in qualitative, quantitive, and structural analysis. Topics covered include flourescence and phosphorescence, Raman, mass spectrometry, nuclear magnetic resonance, X-ray and radiochemistry, and electrochemistry. (SCHA-312)

Class 3, Credit 3

SCHB-702 **Biochemistry**
Registration #1009-702

Introduction to biological chemistry. Chemical structures, reactions and physiological functions of molecular components of cells: amino acids, sugars, lipids, nucleotides and selected biopolymers. Solution behavior, catalytic properties and structure of proteins and enzymes. (SCHO-433 or SCHO-232)

Class 3, Credit 3

SCHB-703 **Biochemistry—Metabolism**
Registration #1009-703

Bioenergetics principles: catabolism of carbohydrates, fatty acids and amino acids; photosynthesis, biosynthesis of carbohydrates, lipids, and nitrogenous compounds; active transport, metabolic diseases. (SCHB-702)

Class 3, Credit 3

SCHB-704 **Biochemistry—Nucleic Acids and**
Registration #1009-704 **Molecular Genetics**

The biochemistry of inheritance, expression of genetic information, protein biosynthesis, differentiation, viral and bacterial infection and the "origin of life." (SCHB-702)

Class 3, Credit 3

SCHC-850 **Media Design Project**
Registration #1010-850

Students in small groups will design, produce, test and evaluate a media form or device for use in the teaching of science at the two-year college level.

Credit 2-4

SCHC-851 Media Design Seminar
Registration #1010-851
A seminar workshop on evaluation and critique, human information processing, and instructional systems management as applied to media production.

No Credit

SCHC-852 Internal Internship
Registration #1010-852
Students in small groups will be assigned to a particular general chemistry course for a minimum of one quarter for the purpose of investigating more efficient utilization of the instructional media, recitation/laboratory periods, and computer aided instruction. Various ways will be explored to assist hearing-impaired and first-year students with remedial work as well as provide advanced work for rapid learners and those with advanced high school preparation.

Credit 2

SCHC-899 Independent Study—Chemistry

Credit variable

SCHC-772 Special Topics—Chemistry
Registration #1010-772
Advanced courses which are of current interest and/or logical continuations of the course already being offered. These courses should be structured as ordinary courses and should have specified prerequisites, contact hours, and examination procedures.

Class variable, Credit variable

SCHC-859 External Research
Registration #1010-859
Industrial internship research.

Credit 0-16

SCHC-870 Chemistry Seminar
Registration #1010-870

Credit 1

SCHC-879 Research and Thesis Guidance
Registration #1010-879
Hours and credits to be arranged. Chemical research in a field chosen by the candidate, subject to approval of the department head and advisor.

Credit variable

SCHI-762, 763 Inorganic Chemistry
Registration #1012-762, -763
The properties and structures of the elements and their compounds in relation to electric and stereochemical principles; inorganic laboratory techniques. (SCHO-433 and SCHP-443)

Class 3, Credit 3

SCHC-762, 763 Advanced Inorganic Chemistry
Registration #1012-762, -763
Theories of molecular geometry; hard-soft, acid-base theory; transition metal chemistry, crystal and ligand field theories, spectroscopic interpretation; reaction mechanisms. (SCHI-762)

Class 3, Credit 3

SCHO-737 Advanced Organic Chemistry
Registration #1013-737
Several of the following advanced topics in organic chemistry are covered: polyfunctional compounds, modern synthetic methods, stereochemistry, conformational analysis, free radical reactions; natural and synthetic polymers. (SCHO-433)

Class 3, Credit 3

SCHO-739 Advanced Organic Chemistry
Registration #1013-739
Selected topics in physical organic chemistry including: techniques for elucidation of mechanism (kinetic, linear free energy relationships, isotope effects), molecular orbital theory, electrocyclic reactions. (SCHO-433 and SCHP-443. Note: SCHO-737 is recommended but not required)

Class 3, Credit 3

SCHO-736 Spectrometric Chemical Identification
Registration #1013-736 of Organic Compounds
This course is concerned with the theory and application of nuclear magnetic resonance, infrared, mass spectrometry, and ultraviolet spectra as applied to organic structure determination. (SCHO-433)

Class 2

SCHO-738 Systematic Identification of
Registration #1013-738 Organic Compounds
The laboratory utilizes systematic chemical and spectral tests to deduce the structure of organic compounds. (SCHO-433)

Class 2

SCHO-832 Stereochemistry
Registration #1013-832
Advanced treatment of steric relationships and stereoisomerism in organic compounds. (SCHO-433, SCHP-443)

Class 3, Credit 3

SCHO-833 Heterocyclic Chemistry
Registration #1013-833
The preparation, properties, and reactions of heterocyclic systems, especially heteroaromatic rings. (SCHO-433)

Class 3, Credit 3

SCHO-835 Organic Chemistry of Polymers
Registration #1013-835
Introduction to the chemistry of synthetic, high molecular weight polymers and a survey of their diverse structures and properties. Mechanisms of condensation, free radical and ionic polymerization. (SCHO-433)

Class 3, Credit 3

SCHP-741 Chemical Thermodynamics
Registration #1014-741
A study of the basic fundamentals of thermodynamics and their use in deriving the interrelationships of thermodynamic functions. Thermodynamic properties of gases will be calculated based on spectroscopic data. (SCHP-443 and SMAM-307)

Class 3, Credit 3

SCHP-742 Survey of Physical Chemistry
Registration #1014-742
This course will present principles of physical chemistry to students who have an interest in the health related sciences. Molecular structure, thermodynamics and kinetics will be discussed with a view to their biological applications. (SCHG-217, SCHO-232)

Class 3, Credit 3

SCHP-743 Chemical Kinetics
Registration #1014-743
Methods of investigating the kinetics of chemical reactions and the theories used to interpret their results. Focus on homogeneous reactions in gas and liquid phases. Discussions of references from recent chemical literature. (SCHP-443)

Class 3, Credit 3

SCHP-744 Quantum Mechanics
Registration #1014-744
Matrix formulation of quantum mechanics, variations and perturbational methods, the uncertainty relations, particle in a box, tunneling, harmonic oscillator, angular momentum and magnetic resonance, the hydrogen atom and more complex atoms. (SCHP-443)

Class 3, Credit 3

SCHP-745 Quantum Chemistry
Registration #1014-745
Application of quantum mechanics to problems of chemical interest. Group theory; calculations of vibrational frequencies and selection rules for complex molecules; molecular orbital energies of complex molecules. (SCHP-744)

Class 3, Credit 3

SCHP-746 Physical Chemistry of Polymers
Registration #1014-746
Study of the theoretical and experimental aspects of polymer characterization. In addition, theoretical considerations of the configuration of polymer chains and statistical thermodynamics of polymer solutions will be related to experimental results (SCHP-443)

Class 3, Credit 3

SCHP-747 Principles of Magnetic Resonance
Registration #1014-747
A development of the principal ideas of magnetic resonance including the theory of resonance line shapes, magnetic interactions, experimental considerations, and spectral analysis. These concepts are discussed in terms of nuclear magnetic, nuclear quadrupole, and electron spin resonance spectroscopy. (SCHP-443)

Class 3, Credit 3

Mathematics

SMAC-265 Discrete Mathematics
Registration #1022-265
An elementary survey of topics from modern applied mathematics that are discrete in nature, including number theory, set theory, machine computation, Boolean algebra, graphs, probability, matrix algebra, difference equations. Applications are stressed. (S)

Class 4, Credit 4

SMAC-365 Combinatorial Mathematics
Registration #1022-365
An introduction to the mathematical theory of combination, arrangement and enumeration of discrete structures. Emphasis is on structural, not quantitative aspects of problems. Topics include enumeration, recursion, inclusion-exclusion, block designs, Polya counting theory. (SMAM-253) (S)

Class 4, Credit 4

SMAC-465 Linear Programming
Registration #1022-465
A presentation of the type of problem to be solved. A review of pertinent matrix theory including convex sets and systems of linear inequalities. The simplex method of solution, artificial bases, duality, parametric programming. Applications. (SMAM-432)

Class 4, Credit 4

SMAC-466 Integer Programming
Registration #1022-466
The optimization of functions of integers, theory and practice of branch and bound, implicit enumeration, cutting plane duality and related solution techniques, heuristics, applications. (SMAC-465)

Class 4, Credit 4

SMAC-4§7 Theory of Graphs and Networks
Registration #1022-467
The basic theory of graphs with applications to problems in transportation, communications and computer networks. Mathematical techniques for analysis of design, performance, and reliability of network structures modeled by graphs. (SMAM-431 or permission of instructor)

Class 4, Credit 4

SMAC-565 Game Theory
Registration #1022-565
Introduction to the theory of games with solution techniques and applications. Graphs, matrix games, linear inequalities and programming, convex sets, the minimax theorem, n-person games, Pareto optimality (SMAM-431 or permission of instructor)

Class 4, Credit 4

SMAC-566 Non-Linear Optimization Theory
Registration #1022-566
The theory of optimization of non-linear functions of several real variables. Unconstrained optimization (Newton-Raphson, steepest ascent and gradient methods), constrained optimization (LaGrange multipliers, Kuhn-Tucker theorem, penalty concept, dynamic programming), computational aspects (rates of convergence computational complexity). (SMAM-432 and SMAM-305)

Class 4, Credit 4

SMAC-567 Theory of Optimal Control
Registration #1022-567
Solutions to the optimal control problem via variational method, Pontrijagin maximum principle, dynamic programming. Linear, time-optimal control processes (controlability, stability. Observability, the synthesis problem.) Implementation of optimal control, system design, computational aspects. Introduction to non-linear processes and recent research interests. (SMAM-432 and SMAM-412)

Class 4, Credit 4

SMAM-201, 202, 203 Algebra, Trigonometry and Analytic
Registration #1016-201, -202, -203 Geometry
A sequence of courses covering essential skills and concepts in such topics as solutions of equations, graphying, exponents and radicals, exponential and logarithmic functions and their applications, trigonometric functions and applications, vectors, determinants, inequalities and conic sections. (201-F, 202-W, 203-S)

Class 3, Credit 3

SMAM-204 Modern Algebra
Registration #1016-204
Topics include a review of the fundamentals of algebra; solution of linear fractional and quadratic equations; functions and their graphs; polynomial, exponential, logarithmic and circular functions; systems of linear equations. (F)

Class 4, Credit 4

SMAM-210, 211 Freshman Seminar
Registration #1016-210, -211
An orientation program for entering mathematics majors to give them information and guidance concerning the various aspects of mathematics and the numerous programs from which they may choose. (210-F, 211-W)

Class 1, Credit 1

SMAM-214, 215 Introductory Calculus
Registration #1016-214, -215
214: A non-rigorous introduction to the study of differential calculus. The following topics will be covered: functions and graphs, limits, continuity, the derivative and its significance, the algebra of derivatives, chain rule, related rates, maxima and minima.
215: A continuation of SMAM-214, dealing with an introduction to integral calculus. The following topics will be covered: definite integral, area, work and distance problems, volumes, fundamental theorem of calculus, approximation techniques, exponential and logarithmic functions, applications, introduction to differential equations. (SMAM-204 or equivalent) (214-F, W; 215-S)

Class 3, Credit 3

SMAM-216, 217 Mathematics of Business and Finance
Registration #1016-216, -217
An introduction to selected topics from those areas of mathematics used extensively in business and finance applications. These topics are useful to any student interested in their personal finances or the operation of a small business.
216: Lines, curves, break-even analysis, interest, cash flow, annuities, business applications and matrices, operations with matrices, systems of linear equations.
217: Optimizing business applications with linear programming methods, Simplex method, transportation and assignment problems, non-rigorous introduction to the derivative, modeling, optimization of applications through differentiation including profit-revenue-cost problems. (SMAM-202 or equivalent) (216-W, S,; 217-S)

Class 3, Credit 3

SMAM-221, 222, 223 College Mathematics
Registration #1016-221, -222, -223
A survey of selected topics from college algebra, trigonometry, analytic geometry and differential calculus generally useful for laboratory technicians. The emphasis is placed on understanding of concepts problem solving and graphs. The topics are divided roughly as follows:
221: Algebra (exponential, log & trig functions; linear equations, curve fitting and special graph papers.)
222: Complex numbers, vector algebra, introduction to limits, graphing of algebraic and exponential functions.
223: Basic differential calculus with strong emphasis on exponential processes.
(221-F, 222-W, 223-S)

Class 4, Credit 4

SMAM-521, 522 Probability Theory
Registration #1016-521, -522
Selected topics in applied probability and statistics to meet the needs and interest of the students. (SMAM-305, SMAM-352 or permission of instructor) (521-F, W; 522-S, SR)

Class 4, Credit 4

SM AM-531, 532 Abstract Algebra
Registration #1016-531, -532
531: A review of pertinent basic set theory and number theory. Groups, subgroups, cyclic and permutation groups, LaGrange's theorem, quotient groups, isomorphism theorems, applications to scientific problems.
532: The basic theory of rings, integral domains, fields, modules, the theory of vector spaces in the context of modules. Applications of the theory of vector spaces to differential equations and problems in engineering such as stability of control systems. (SMAM-341 or permission of instructor) (531-F, W,; 532-S, SR)

Class 4, Credit 4

SM AM-551 Topics in Algebra
Registration #1016-551
Topics in abstract algebra to be chosen by the instructor either to give the student an introduction to topics not taught in SMAM-531, 532 α to explore further the theory of groups, rings, or fields. (Permission of instructor) (F, W)

Class 4, Credit 4

SMAM-552 Topics in Analysis
Registration #1016-552
Topics in analysis to be chosen by the instructor, either to introduce the student to topics not covered in SMAM-411, 412, or to explore further the topics covered there. (SMAM-341, SMAM-412) (S, SR)

Class 4, Credit 4

SM AM-559 Special Topics—Mathematics
Registration #1016-559
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. These courses will be structured as ordinary courses and will have prerequisites, contact hours, and examination procedures specified in advance.

Class variable, Credit variable

SMAM-561, 562 Complex Variables
Registration #1016-561, -562
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's and Laurent's series; singularities; residues; analytic continuation; conformal mapping. A more in-depth study of analytic function theory than SMAM-420. (SMAM-305 and either SMAM-341 or permission of instructor) (561-F, W; 562-S, SR)

Class 4, Credit 4

SM AM-571, 572 Topology
Registration #1016-571, 572
Metric spaces, topological spaces, separation axioms, compactness, connectedness, product spaces. (SMAM-412 or permission of instructor) (571-F, W; 572-S, SR)

Class 4, Credit 4

SMAM-599 Independent Study—Math
Registration #1016-599
Faculty directed study of appropriate topics on a tutorial basis. This course will generally be used to enable an individual to pursue studies of existing knowledge available in the literature.

Class variable, Credit variable

SMAM-711 Engineering Mathematics
Registration #1016-711
A brief introduction to analytic functions. Cauchy theory, linear transformations, Taylor and Laurrent series, residue theory with applications to real integrals and Fourier integrals. (F, W)

Class 3, Credit 3

SMAM-712 Engineering Mathematics
Registration #1016-712
Partial differentiation, curvilinear coordinates, line integrals, vector calculus, curl, divergence, theorems of Greene, Gauss, Strokes. (S, SR)

Class 3, Credit 3

SM AM-620 The Fourier Transform
Registration #1016-620
This course provides an introduction to an important mathematical tool for the analysis of linear systems. Topics covered are: a Fourier integral theorem; the Fourier transform and its inverse; an introduction to generalized functions; the Dirac delta function; evaluating transforms; convolution; serial products; the sampling theorem; Rayleigh, power, convolution, and auto-correlation theorems; the discrete Fourier transform; the fast Fourier transform. (SMAM-420) □□□

Class 4, Credit 4

SMAT-420 Introduction to Solution
Registration #1019-420 of Engineering Problems
Application of algebra and trigonometry to solution of engineering problems. Development and application of differential calculus to electromechanical problems. Introduction to integration.

Class 4, Credit 4

SMAT-421, 422 Solution of Engineering
Registration #1019-421, -422 Problems, I, II
Application of principles of mathematics and physics to the solution of engineering and technical problems. To include the principles of calculus applied to solutions of problems in mechanics, thermodynamics, electric circuits, and vibrations.

Class 4, Credit 4

SMAM-2S1, 252, 253 Calculus
Registration #1016-251, -252, -253
A standard first course in calculus intended for students majoring in mathematics, a science or engineering with the major emphasis placed on understanding the concepts and using them to solve a variety of physical problems. The subject matter is divided as follows:
251: Two-dimensional analytic geometry, function, limits, the derivative and its formulas (in terms of algebraic functions). Applications of the derivative, introduction to anti-differentiation.
252: The transcendental functions. Anti-derivatives by various methods. The definitive integral applications to area, work, etc. Numerical integration.
253: Parametric equations, polar coordinates, more techniques of anti-differentiation, improper integrals, indeterminate forms. Application of integrals to volumes, moments. Infinite series. (251-F.252-W, 253-S)

Class 4, Credit 4

SM AM-300 Transfer Math
Registration #1016-300
Content includes material taught in SMAM-253 and SMAM-305. (SR)

Class 8, Credit 8

SMAM-305 Calculus
Registration #1016-305
A continuation of SMAM-253 treating partial derivatives, multiple integrals, 3-dimensional analytic geometry and vector algebra. (SMAM-253) (F, SR)

Class 4, Credit 4

SMAM-306 Differential Equations
Registration #1016-306
A first course. Solutions in closed form for a few common types of first order equations. Applications to a variety of physical problems. Second order linear equations, methods of undetermined coefficients and variation of parameters, independence and the Wronskian. Applications to vibrating systems. Numerical techniques Runge-Kutta. More applications. Power series solutions. (SMAM-305) (W)

Class 4, Credit 4

SMAM-307 Differential Equations
Registration #1016-307
Topics include LaPlace transform, systems of linear differential equations, some Fourier series and their use in partial differential equations. Numerical techniques in boundary value problems. (SMAM-306) (S)

Class 4, Credit 4

SMAM-308 Engineering Mathematics
Registration #1016-308
Topics will be chosen from among matrix algebra, vector analysis and applications of boundary-initial value problems to suit students' academic discipline. (SMAM-306) (S)

Class 4, Credit 4

SMAM-309 Statistics
Registration #1016-309
Handling of statistical data; measures of central tendency and dispersion; sample space, events; probability and its basic laws; conditional probability; basic rules of counting; binomial, geometric, Poisson and normal distributions; sampling distributions; estimation of population mean; t-distributions, testing of hypothesis concerning the mean and difference between means. Use of chi-square in testing statistical independence and inestimating variance. (W, S)

Class 4, Credit 4

SMAM-341 Foundations of Higher Mathematics
Registration #1016-341
A study of basic concepts involved in mathematics, a development of mathematical reasoning, and their applications to various mathematical topics. Students will be involved in the development of concepts and presentation of results. Content includes logic, switching circuits, sets equivalence relations, functions, inverses, permutations, limits, algebraic concepts, applications. (S)

Class 4, Credit 4

SM AM-351, 352 Introduction to Probability
Registration #1016-351, -352 and Statistics
Discrete and continuous probability; random variables; probability, density, and distribution functions. Measures of central tendency and dispersion. Sampling theory; confidence limits; correlation. (SMAM-253) (351-F„ S, SR; 352-W, S)

Class 4, Credit 4

SMAM-361 Mathematical Modeling
Registration #1016-361
The course will emphasize problem solving, formulation of the mathematical model from physical considerations, solution of the mathematical problem, testing the model and interpretation of results. Problems will be selected from the physical sciences, engineering, economics. (SMAM-352, SMAM-306) (S)

Class 4, Credit 4

SMAM-410 Advanced Calculus
Registration #1016-410
Topics from multi-dimensional calculus, Fourier series, special functions, special techniques for differential equations and asymptotic expansions. Alternate topics may be chosen to suit special needs of students. (SMAM-306 or SMAM-308) (Offered upon sufficient demand)

Class 4, Credit 4

SMAM-411, 412 Real Variables
Registration #1016-411, -412
Functions of one and of several variables are considered with the basic concepts of sequence, series, continuity, differentiation, and integration studies in depth. Included are the Heine-Borel, mean value, Taylor, and implicit function theorems. (SMAM-305 and either SMAM-341 or permission of instructor) (411-F, W; 412-S, SR)

Class 4, Credit 4

SMAM-420 Complex Variables
Registration #1016-420
A study of the complex number system and preliminary items leading to the concepts of an analytic function. Integrals of complex functions, Cauchy integral theorem, Cauchy integral formulas. If time allows, topics such as Taylor and Laurent series, singularities, residues, conformal mapping, and special transformations are discussed. (SMAM-305) (F, W)

Class 4, Credit 4

SMAM-431, 432 Linear Algebra
Registration #1016-431, -432
A first course in the algebra of matrices and n-tuple vectors over the complex numbers. Topics include systems of linear equations, their solution by several different algorithms, stability of solutions; vector and matrix algebra; inner products and norms of vectors, linear independence, dimension, rank; Gram-Schmidt theorem; matrix inversion and determinants; eigen values, eigenvectors and their approximation.
413; A survey of most of these topics with the emphasis on computation and application to physical problems and as such is a course aimed at all students of engineering and science with minimal mathematical prerequisites.
432; Will pursue the topics to greater depth and will lay more emphasis on theory. It is intended for the more serious student of mathematics. (431-F, W, S; 432-S, SR)

Class 4, Credit 4

SM AM-501, 502 Advanced Differential Equations
Registration #1016-501, -502
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. (SMAM-307) (501-F, W; 502-S SR)

Class 4, Credit 4

SMAM-511, 512 Numerical Analysis
Registration #1016-511, -512
Numerical techniques for interpolation, differentiation, quadrature, solution of differential equations, non-linear equations, eigenvalue problems. Discussion of error propagation and estimation. Emphasis is on techniques appropriate for digital computers. (SMAM-306, ICSP-215) (511-F, W; 512-S, SR)

Class 4, Credit 4

Physics

SPSP-200 Physics Orientation
Registration #1017-200
Introduction to physics as a profession and opportunities for physicists in inter-disciplinary efforts. Introduction to the literature of physics. (F)

Class 1, Credit 0

SPSP-201, 202 Physics in the Arts
Registration #1017-201 -202
A study of topics from the world of art in which the underlying physical laws have influenced the art form and its development. A weekly laboratory will allow study of the relation of an art form to basic optical, mechanical, and electrical physics and in addition will provide time for the development of student projects. (W, S)

Class 2, Lab. 2, Credit 3

SPSP-205, 206, 207 General Physics
Registration #1017-205, -206, -207
General physics for engineering students. Mechanics, heat, sound, and electricity and magnetism, making moderate use of calculus, (co-registration or credit in SMAM-252, 253) (205-W; 206-S; 207-F)

Class 3, Credit 3

SPSP-211, 212, 213 College Physics
Registration #1017-211, -212, -213
An elementary course in college physics. Mechanics, heat, sound, light, and electricity and magnetism, with some elements of modern physics. (SMAM-203 or SMAM-223) (211-F, W; 212-W, S; 213-F, W, S)

Class 3, Credit 3

SPSP-214, 215, 216 Physics for Graphic Arts
Registration #1017-214, -215, -216
An introductory course in college physics covering the fundamentals of mechanics, heat, sound, light, electricity and magnetism, and some modern physics, with emphasis on topics having application in the printing industry. (SMAM-203) (214-F; 215-W; 216-S)

Class 3, Credit 3

SPSP-217, 218, 219 Physics for Graphic Arts Lab
Registration #1017-217, -218, -219
The labs for these courses will include experiments related to the principles and theories discussed in the corresponding lectures (SPSP-214, 215, 216) (F, W, S)

Lab. 2, Credit 1

SPSP-271, 272, 273 College Physics Lab
Registration #1017-271, -272, -273
The labs for these courses will include experiments related to the principles and theories discussed in the corresponding lectures. (SPSP-211, 212, 213). (F, W, S)

Lab. 2, Credit 1

SPSP-275, 276, 277 General Physics Lab
Registration #1017-275, -276, -277
The labs for these courses will include experiments related to the principles and theories discussed in the corresponding lectures (SPSP-205, 206, 207). (F, W, S)

Lab. 2, Credit 1

SPSP-301 Electronics for Technologists
Registration #1017-301
A laboratory-oriented course to provide the science or technology student with a basic understanding of electronics and instrumentation. Particular emphasis is placed on systems encountered in chemical laboratories. (SPSP-213) (W, S)

Class 1, Lab. 6, Credit 3

SPSP-311, 312, 313 University Physics
Registration #1017-311, -312, -313
An intensive course in general physics, using calculus, for majors in the sciences. Mechanics, heat, sound, electricity and magnetism, and light. Two parallel labs are available for this course, one a 2-hour lab and the other a 3-hour lab. Physics majors have to take a 3-hour lab, others may opt for either of the labs. (Co-registration or credit in SMAM-252, 253) (311-F, W; 312-W, S; 313-F, S)

Class 4, Credit 4

SPSP-314, 315 Introduction to Modem Physics
Registration #1017-314, 315
An introductory survey of modern physics at the sophomore level. Fundamentals of relativity, atomic phenomena, introduction to quantum physics, elementary wave mechanics, nuclear physics, statistical mechanics, and solid state physics. (SMAM-305, SPSP-207, or SPSP-313) (314-W; 315-S)

Class 4, Credit 4

SPSP-319 Electrical Processes in Solids
Registration #1017-319
Electronic properties of conductors and semiconductors, junction characteristics, operating principles of solid state devices. Theory and application. (SPSP-315 or permission of instructor) (W, S)

Class 4, Credit 4

SPSP-321 Introduction to Laboratory Techniques
Registration #1017-321
A.C. circuits, the oscilloscope, vacuum systems.

Class 2, Lab. 3, Credit 3

SPSP-331 Introduction to Electricity and Electronics
Registration #1017-331
Fundamentals of electricity-construction and measurements of electrical and electronic circuits encountered in a scientific laboratory. (S)

Class 4, Lab. 3, Credit 5

SPSP-341 Foundations of Scientific Thinking
Registration #1017-341
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 science at the college level.) (F, W)

Class 2, Credit 2

SPSP-351, 352, 353 Radiation Physics
Registration #1017-351, -352, -353
The physics of nuclear radiation and the electronics used in its detection and monitoring. Application of radioactivity to nuclear medicine. (SPSP-213, SMAM-223 required; SMAM-309 recommended) (351-F; 352-W; 353-S)

Class 4, Lab. 3, Credit 5

SPSP-371, 372, 373 University Physics Lab
Registration #1017-371, -372, -373
The labs for these courses will include experiments related to the principles and theories discussed in the corresponding lectures (SPSP-311, 312, 313) (F, W, S)

Lab. 3, Credit 1

SPSP-380 Theoretical Physics I
Registration #1017-380
Introduction to the theoretical concepts and techniques used in the description of physical phenomena: fields, periodic phenomena, quantization, etc. (SPSP-314, SMAM-306)

Class 3, Credit 3

SPSP-401, 402 Intermediate Mechanics
Registration #1017-401, -402
Particle dynamics, systems of particles, motion of a rigid body, gravitational fields and potential, moving coordinate systems, generalized coordinates. Lagrange's equations, mechanics of continuous media. (SMAM-306, SPSP-313) (401-F; 402-S)

Class 4, Credit 4

SPSP-411, 412 Electricity and Magnetism
Registration #1017-411, -412
Electric and magnetic fields using vector methods, Gauss's law, theory of dielectrics, Ampere and Faraday laws, vector potential, displacement current, Maxwell's equations. (SMAM-308, SPSP-401) (411 -F; 412-S)

Class 4, Credit 4

SPSP-415 Thermal Physics
Registration # 1017-415
Fundamental principles of classical thermodynamics, kinetic theory, statistical mechanics, and low temperature physics. Applications to physical problems. (SMAM-306, SPSP-313) (F alternate years)

Class 4, Credit 4

SPSP-421, 422 Experimental Physics
Registration # 1017-421, -422
Advanced laboratory work in physics, with experiments selected from one or more of the following branches of physics: mechanics, acoustics, heat, electro-magnetism, and physical optics. (SPSP-313 plus co-registration or credit in any one of these: SPSP-401, 411, 415, 455) (421 -F, 422-S)

Class 1, Lab. 3, Credit 2

SPSP—431, 432 Electronic Measurements
Registration # 1017-431, -432
Laboratory course in electrical and electronic measurements and instrumentation, with theory of electron emission, electron tubes, and solid state devices as needed. (SPSP-313, SPSP-321) (431-F, 432-S)

Class 2, Lab. 3, Credit 3

SPSP-455 Optical Physics
Registration # 1017-455
Introduction to wave phenomena as applied to the electromagnetic spectrum. Interaction of radiation with matter. (SMAM-305, SPSP-313) (F alternate years)

Class 4, Credit 4

SPSP-501 Theoretical Physics II
Registration # 1017-501
Application of advanced, mathematical methods to physics. (SMAM-308 plus co-registration or credit in SPSP-401 and SPSP-411) (S)

Class 4, Credit 4

SPSP-521 Advanced Experimental Physics
Registration # 1017-521
Advanced laboratory experiments and projects in atomic physics, nuclear physics, or solid state physics. Special emphasis on experimental research techniques. (SMAM-307, SPSP-421) (F)

Lab. 6, Credit 2

SPSP-531, 532 Solid State Physics
Registration # 1017-531, -532
The structure of solids and their mechanical, thermal, electrical, and magnetics properties. (SMAM-307, SPSP-552) (531-S, 532-offered upon sufficient request)

Class 4, Credit 4

SPSP-541, 542, 543 Physics Research
Registration # 1017-541, -542, -543
Faculty directed student projects or research usually involving laboratory work and/or calculations that could be considered of an original nature.

Class variable. Credit variable.

SPSP-550, 551 Physics Seminar
Registration # 1017-550, -551
Discussions of contemporary developments in physics. Special emphasis on technical literature search, preparation and presentation of technical papers. (Senior physics majors.) (550-F, 551-S)

Class 1, Credit 1

SPSP-552 Atomic Physics and Quantum
Registration # 1017-552 Mechanics
Elements of relativistic mechanics and of wave mechanics, quantum theory, Schroedinger's equation and its solutions, atomic spectra and atomic structure. (SPSP-501; SPSP-315 or permission of instructor. (F)

Class 4, Credit 4

SPSP-553 Nuclear Physics
Registration # 1017-553
A study of the structure of the atomic nucleus as determined by experiment and theory. Description and quantum mechanical analysis of nuclear properties, radioactivity, and nuclear reactions. (SPSP-552) (S)

Class 4, Credit 4

SPSP-559 Special Topics—Physics
Registration #1017-559
Advanced 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 specified 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; Astro-physics; Astronomy.

Class variable, Credit variable

SPSP-599 Independent Study—Physics
Registration # 1017-599
Faculty directed study of appropriate topics on a tutorial basis. This course will generally be used to enable an individual to pursue studies of existing knowledge available in the literature.

Class variable, Credit variable

Health Related Professions

SHPG-201 Issues, Trends and Careers
Registration #1026-201 in Health Professions
A panel-type seminar covering a variety of concerns in the health care system. Topics will be on career options, legislation, educational needs, community services, health institutions, and social implications. Panelists will respond to questions from the class. A short paper discussing one of the topics will be required at completion.

Class 1, Credit 1

SHPG-401 Introduction to Radioimmunoassay
Registration #1026-401
Combination lecture/laboratory in radioimmunoassay. Theory and basic principles; instrumentation; specific assays; quality control and future trends in RIA. (W)

Credit 2

SHPR-301 Respiratory Therapy I:
Registration #1027-301 Gas, Aerosol/Humidity
The therapeutic techniques and applications of medical gas and aerosol therapies and their theoretical bases are covered in lecture, laboratory, and clinical practice.

Credit 7 (126 clock hours)

SHPR-302 Respiratory Therapy II: Cardiorespiratory
Registration #1027-302 Drug Administration
The properties of aerosols and cardiorespiratory drugs, methods of aerosol generation, and therapeutic techniques of cardiorespiratory drug administration are covered in lecture, laboratory, and clinical practice.

Credit 4 (74 clock hours)

SHPR-303 Respiratory Therapy III: IPPB Therapy
Registration #1027-303 and Pulmonary Drainage
The physiological principles and therapeutic techniques of IPPB, deep breathing, and chest physical therapy are covered in lecture, laboratory, and clinical training.

Credit 8 (154 clock hours)

SHPR-304 Respiratory Therapy IV: Pulmonary
Registration #1027-304 Function Testing
The physiological principles underlying pulmonary function testing and the theory and operation of equipment utilized in testing are covered in lecture, laboratory, and clinical practice.

Credit 4 (77 clock hours)

SHPR-305 Respiratory Therapy V: Continuous Ventilation
Registration #1027-305 and Airway-Trach Care
The theoretical bases for, operation of, and clinical indications for continuous mechanical ventilation and patent airway maintenance are covered in lecture, laboratory, and clinical practice.

Credit 9 (172 clock hours)

SHPR-306 Respiratory Therapy VI: Cardiopulmonary
Registration #1027-306 Resuscitation and Emergency Care
The physiological bases of cardiac failure/arrest and the theory and procedures of resuscitation techniques are covered in lecture, laboratory, and clinical practice.

Credit 2 (35 clock hours)

SHPR-307 Respiratory Therapy VII:
Registration #1027-307 Infection Control
The theory and techniques for infection control relative to respiratory therapy and aseptic patient care.

Credit 2 (38 clock hours)

SHPC-859 External Research
Registration # 1023-859
Clinical intership research.

Credit 1-16

SHPC-811, 812, 813 Advanced Clinical
Chemistry Laboratory I, II, III
Registration # 1023-811, 812, 813
A series of three independent laboratory courses in advanced clinical chemistry techniques that is designed to complement lecture material covered in each of the advanced clinical chemistry lecture courses. In-depth studies of several different methods of separation and analyses of clinically significant compounds are carried out. Topics include isoenzyme analyses, radioimmunoassay techniques and toxicological studies.

Lab. 6, Credit 2

SHPC-820, 821, 822 Advanced Chemistry I, II, III
Registration #1023-820, -821, -822
A three-course sequence in modern techniques and methodology of clinical chemistry with emphasis on quality control, instrumentation, and automation. This shall include modern general methods of analytical chemistry, the technical aspects of the tests used, and the principles of the methods involved. Additionally, an understanding of normal and abnormal values shall be stressed in relationship to health and disease. (SBIT-432, 433 or equivalent; SCHB-603)

Class 2, Credit 2/Qtr.

SHPC-879 Clinical Chemistry Research
Registration # 1023-879
Hours and credits to be arranged. Research in a field chosen by the candidate, subject to approval of the department head and advisor.

Credit variable

SHPC-899 Independent Study
Faculty directed study of appropriate topics on a tutorial basis. This course will generally be used to enable an individual to pursue studies of existing knowledge available in the literature.

Class variable, Credit variable

Institute College

School of Engineering Technology

Upper-Division Civil Engineering Technology

ITEC-420 Hydraulics
Registration #0608-420
Study of liquid flow in pipes and open channels, hydrostatic pressures and forces, stability, devices to measure pressure, velocity, and flow, pump selection, development of pump characteristic curves, and the introduction to design of sewer and water lines.

Class 3, Lab. 3, Credit 4

ITEC-428 Report Writing
Registration #0608-428
The principles of organizing data and information into clear and concise engineering memos, trip reports, and business letters. The techniques of library research, and oral reports using video tapes of student presentations are also stressed.

Class 3, Credit 2

ITEC-432 Water & Wastewater Transport Systems
Registration #0608-432
Discussion of surface and groundwater sources. Introduction to well hydraulics. The hydraulic design of sanitary and storm sewer systems, and water distribution systems.

Class 2, Recitation 3, Credit 3

ITEC-434 Environmental Pollution
Registration #0608-434
The study of various forms of pollution including air, thermal, noise, erosion, pesticides, radiation, and visual pollution, with the investigation of the sources, measurement, methods of control, legislation, codes, and enforcing agencies. Several expert-guest speakers will also lecture.

Class 3, Credit 3

ITEC-438 Principles of the Treatment
Registration #0608-438 of Water and Sewage
An introduction to water and wastewater treatment interpretation of analyzed physical, chemical, and biological parameters of water quality with regard to the design and operation of treatment processes and to the control of the quality of natural water; fundamental principles and applications of physical, chemical and biological processes employed in water and wastewater treatment; analysis of waste assimilative capacity of streams.

Class 3, Lab. 2, Credit 4

ITEC-510 Design of Water Treatment Facilities
Registration #0608-510
Principles of water treatment plant design; conceptual and hydraulic design of water purification and conditioning facility. The topics discussed include the design of a rapid sand filtration plant with water softening treatment.

Class 3, Lab. 2, Credit 3

ITEC-513 Computer Techniques in Civil
Registration #0608-513 Engineering Technology
Designed to complement Computer Techniques, ICSP-205, as an introduction to problem oriented languages such as COGO, STRESS, and other proprietory systems.

Lab. 2, Credit 1

ITEC-514 Land Planning
Registration #0608-514
The basic concepts of zoning: residential, commercial, industrial, agricultural; concepts of flood plains, green belts, protection of wetlands, wild and scenic river designation, wilderness areas are studied as well as the functions of zoning and planning boards.

Class 2, Credit 2

ITEC-516 Structural Analysis and Design I
Registration #0608-516
The analysis and design of continuous reinforced concrete beams and frames are reviewed as well as the method of moment distribution and ultimate design theory using ACI Code. A design project is emphasized.

Class 3, Recitation 2, Credit 4

ITEC-520 Design of Wastewater Treatment Facilities
Registration #0608-520
Principles of wastewater treatment plant design; conceptual and hydraulic design of activated sludge and trickling filter plants are studied. Tertiary treatment facilities, such as nitrogen and phosphorous removal will be discussed.

Class 3, Lab. 2, Credit 4

ITEC-527 Soil Mechanics and Foundations
Registration #0608-527
The properties of soils, stresses and settlement in soils, seepage, slope stability, earth pressures on structures, determination of bearing capacity, types of foundations and their interrelation with the supporting soil are explored.

Class 3, Lab. 2, Credit 4

ITEC-544 Contracts and Specifications
Registration #0608-544
A study of the contract documents; the relationship between the owner, engineer, and contractor; various types of contracts and specifications are studied as well as an introduction to engineering law.

Class 3, Credit 3

ITEC-546 Professional Principles and Practices
Registration #0608-546
A treatment of legal and ethical aspects of the profession; review of codes of ethics and current professional problems; several guest speakers representing different segments of the civil engineering field.

Class 1, Credit 1

Civil Technology Electives

ITEC-549 Environmental Engineering Project
Registration #0608-549
Theory and laboratory study of certain aspects of water pollution control treatment processes. Students are required to prepare a technical paper based on the laboratory findings.

Class 2, Lab. 6, Credit 4

ITEC-550 Construction Practices
Registration #0608-550
An introduction to basic construction management and organization with CPM scheduling, estimating, bidding, heavy construction techniques, methods, and equipment applications.

Class 3, Recitation 2, Credit 4

ITEC-552 Structural Analysis and Design II
Registration #0608-552
Analysis and design of steel structures using AISC code; topics include high-strength bolts, welding, design of building frames, study of typical contract and shop drawings.

Class 3, Recitation 2, Credit 4

ITEC-556, 557 Wastewater Treatment Plants Operation and Control f & II
Registration #0608-556, -557
A self-paced audio-visual course. Emphasis on the functional aspects of wastewater treatment plants' operation. Discussion of the significance of the results of laboratory analysis and their interpretation and application to the control of treatment processes.
Prerequisite: ITEC-438 and consent of instructor

Credit 1-4

ITEC-599 Independent Study
Registration #0608-599
A supervised investigation within a civil technology area of student interest. Consent of the instructor is required.

Credit 1-8

Construction

ITEC-422 Elements of Building Construction
Registration #0608-422
Elements and details of building construction; study of fundamental design concepts; building codes; foundations; wood, steel and concrete construction methods; floor and wall systems; and introduction to construction specifications and management.

Class 4, Credit 4

ITEC-444 Mechanical Equipment for Buildings
Registration #0608-444
Presentation of mechanical and electrical equipment used in building construction; the pertinent codes will be studied; emphasis will be given to energy aspects of equipment design and selection.

Class 3, Credit 3

ITEC-450 Construction Management
Registration #0608-450
Construction company organization, time and resource scheduling for construction operations (CPM); role of the construction manager; project finance; cash flow; bonding and insurance.

Class 4, Credit 4

ITEC-460 Construction Equipment
Registration #0608-460
Fundamentals of equipment selection; determining equipment requirements based upon the design and capabilities of currently available construction machinery.

Class 3, Credit 3

ITEC-470 Timber Design and Construction
Registration #0608-470
Application of structural design methods to timber; concrete forms, temporary bracing, shoring, ground support, piles, scaffolding.

Class 4, Credit 4

ITEC-500 Labor Relations
Registration #0608-500
Introduction to labor law, area practices, labor negotiations, trade unions, jurisdictional considerations.

Class 3, Credit 3

ITEC-508 Cost Estimates
Registration #0608-508
An introduction to the fundamentals of cost estimating and bidding construction projects; labor and material takeoffs, equipment costs, overhead, and profit.

Class 3, Credit 3

Upper-Division Electrical Engineering Technology

ITEE-310 Electricity
Registration #0609-310
An introduction to electricity for photo management majors. Topics covered are basic circuit analysis and the D.C. operation of diodes, transistors, vacuum and gas tubes. Some electronic circuit analysis is covered.

Class 3, Lab. 3, Credit 4

ITEE-311 Electronics I
Registration #0609-311
Continuation of ITEE-310. Analysis of A.C. circuits is covered. Power supplies and circuits used in the 5s printer are analyzed. Additional circuits relating to photography are covered. (ITEE-310)

Class 3, Lab. 3, Credit 4

ITEE-312 Electronics II
Registration #0609-312
Continuation of ITEE-311. Digital circuits and transistors are covered. Circuits used in the 2610 and 2620 printers are analyzed. Electro-optic devices are discussed. (ITEE-311)

Class 3, Lab. 3, Credit 4

ITEE-401 Circuit Theory I
Registration #0609-401
An introductory course in the use of LaPlace transforms to determine the complete response of circuits containing independent and dependent sources, resistance, inductance, and capacitance. Application of basic circuit theorems to the solution of transformed networks. (SMAT-420 concurrently)

Class 3, Lab. 2, Credit 4

ITEE-402 Circuit Theory II
Registration #0609-402
Frequency response of network functions as solved by use of pole-zero diagrams and Bode diagrams. Mutual inductance. The Fourier series solution of circuits with non-sinusoidal inputs. (ITEE-401)

Class 3, Lab. 2, Credit 4

ITEE-404 Control Systems I
Registration #0609-404
Analysis of closed loop control systems for stability, accuracy, response time; Routh's and Nyquist's stability criteria, gain and phase margin, static error coefficient, lead and lag compensating networks. (ITEE-402, SMAT-422)

Class 3, Lab. 2, Credit 4

ITEE-411 Electrical Principles for Design I
Registration #0609-411
A service course offered to non-electrical majors studying in the technical disciplines; covers basic electrical circuits, network theorems, applications of Ohms and Kirchoff's laws in D C and A C. circuits, power and energy concepts, efficiency, and metering

Class 3, Lab. 3, Credit 4

ITEE-412 Electrical Principles for Design II
Registration #0609-412
A review of A.C. resonance in series and parallel circuits, three-phase circuits, rotating machines and their application; transformers, semiconductor theory, bridges, power supplies, and phase shifting circuits. (ITEE-411)

Class 3, Lab. 3, Credit 4

ITEE-414 Basic Electrical Principles
Registration #0609-414
Basic survey of important aspects of electricity including important laws of electrical networks for both A.C. and D C.; emphasis is placed on such topics as power factor, efficiency, costs of electricity, lighting, line losses, breakers and fusing, transformers, motors and three-phase fundamentals. (SMAT-421)

Class 3, Lab. 3, Credit 4

ITEE-424 Logic & Digital Devices
Registration #0609-424
The analysis and simplification of logic equations using Boolean algebra with application to semiconductor integrated circuits and relay circuits. Truth tables and Karnaugh map reduction techniques, sequential circuits, state tables and counter circuits are also studied

Class 3, Lab. 2, Credit 4

ITEE-428 Linear Amplifier Design
Registration #0609-428
The design of transistor bias networks to meet specific circuit requirements is discussed. A study of the design and analysis of bi-polar and FET amplifiers is done with emphasis placed on low and high frequency response characteristics. Also discussed are tuned amplifiers, special considerations necessary in dealing with transistor arrays, and transient response characteristics. (SMAT-421, ITEE-402 concurrently)

Class 3, Lab. 3, Credit 4

ITEE-499 Co-operative Education
Registration #0609-499
One quarter of appropriate work experience in industry.

Credit 0

ITEE-S20 Electrostatic and Magnetic Fields
Registration #0609-520
Basic principles of electrostatic fields including vector analysis, Coulomb's law, field intensity, Gauss's law, energy and potential difference, potential gradient, conductors, dielectrics, capacitance, and experimental mapping methods. (SMAT-422)

Class 3, Lab. 2, Credit 4

ITEE-521 Electromagnetic Fields and Antennas
Registration #0609-521
The time varying fields, Maxwell's equations, characteristic impeance and radiation patters of the dipole antenna are explored. Design of antenna arrays for UHF-VHF and microwave application are also discussed; microwave antenna design. (ITEE-520)

Class 3, Lab. 2, Credit 4

ITEE-524 Microwave Systems
Registration #0609-524
Microwave power sources, waveguide transmission systems, measurement of standing waves, impedance, power flow in waveguides, solid state microwave devices, and microwave communication system design are discussed. (IT£E-520)

Class 3, Lab. 3, Credit 4

ITEE-526 Semiconductor Physics
Registration #0609-526
Theoretical description of p-n junctions and semi-conductor phenomena; transistor and FET models are developed to obtain parameters; solid state device characteristics are derived. (ITEE-428)

Class 4, Credit 4

ITEE-532 Power Amplifier Design
Registration #0609-532
Design of Class A and B low frequency power amplifiers including distortion analysis, feedback, and class C, R.F. power amplifier design using transistors. Thermal considerations for power transistors and heat sink design are included. (ITEE-428)

Class 3, Lab. 3, Credit 4

ITEE-534 Communication Systems I
Registration #0609-534
An introduction to AM, DSB, SSB and FM modulation systems and their spectrums. Circuitry for their generation and demodulation; frequency division multiplex and the analysis of mixing circuits; the Sampling Theorem and its application to time division multiplex. (ITEE-428)

Class 3, Lab. 2, Credit 4

ITEE-535 Communication Systems II
Registration #0609-535
Pulse modulation systems including, pulse amplitude modulation, pulse width modulation and pulse position modulation; pulse code modulation as applied to voice and to digital data transmission; introduction to noise and its effect on communication system performance; introductory information theory; analysis and design of communication systems. (ITEE-534)

Class 4. Credit 4

ITEE-536 Control Systems II
Registration #0609-536
Design of control systems for specific application and performance criteria; a study of control motors and components for D.C./A.C. control systems; application of control theory to the solution of practical system problems (ITEE-404)

Class 3, Lab. 2, Credit 4

ITEE-538 Digital Computer Design I
Registration #0609-538
Design of logic circuits using 7400 series TTL gates; a study of TTL flip-flops, one shots and oscillator circuits; design of arithmetic circuits, shift registers and counters. (ITEE-424, 540)

Class 3, Lab 2, Credit 4

ITEE-539 Digital Computer Design II
Registration #0609-539
A continuation of ITEE-538 with application of logic circuits to computer design. Multiplexers, semiconductor memories, ALUs and their applications to computers and microprocessors are considered. The basic operation of computers, and computer systems are examined. Machine language programming, indexing and indirect addressing and interrupt programming are introduced. Peripheral devices and interfaces are discussed if time permits. (ITEE-538)

Class 3, Lab. 2, Credit 4

ITEE-540 Pulse Circuit Design
Registration #0609-540
The response of R-C circuits to pulse and square waves; switching characteristics of transistors: rise, fall, and storage time; clipping and clamping circuits; design of transistor logic gates and inverters; design of multivibrators, Schmitt triggers, differential amplifiers, comparators, trigger and counting circuits. (ITEE-428)

Class 3, Lab. 2, Credit 4

ITEE-542 Microprocessors
Registration #0609-542
An introductory course in Microprocessors emphasizing the Motorola 6800 and Intel 8085. the topics covered include the CPU, ROMS, RAMS, programming and interface ICs. Practical applications of microprocessors are also considered. (ITEE-539)

Class 2, Lab. 4, Credit 4

ITEE-543 Minicomputers, Controllers and
Registration #0609-543 Peripherals
A study of popular minicomputers and most common peripherals that they use. The course includes the PDP-8, PDP-11, and NOVA minicomputers. Peripherals include TTYs, MODEMS, tape drives, disc drives, cassettes, card readers, line printers, and D/A and A/D converters. Methods of interfacing these peripherals to minicomputers and microprocessors are emphasized. (ITEE-539)

Class 2, Lab. 4, Credit 4

ITEE-544 Integrated Circuit Theory & Applications
Registration #0609-544
Brief introduction to fabrication. Small scale logic (TTL, ECL, CMOS), medium scale logic (FF, counters, registers) and large scale logic (memories, microprocessors, CCDs) are discussed from a hardware point of view with applications. Linear ICs such as the OP-AMP, VR and communication circuits are analyzed. (ITEE-424, 540)

Class 3, Lab. 2, Credit 4

ITEE-545 Applications of Linear
Registration #0609-545 Integrated Circuits
A study of the applications of linear integrated circuits including summers, integrators, differentiators, active filters, analog computation, comparators and regulators. Actual and ideal characteristics are compared and studied. (ITEE-428)

Class 3, Lab. 2, Credit 4

ITEE-546 Industrial Electronics
Registration #0609-546
Design of SCR/Triac control circuits for D.C. and A.C. motors; control of lights and heating elements with D C. power supplies and polyphase rectifier circuits; speed control of D C. and A.C. motors: process control systems utilizing solid state electronic circuits. (ITEE—532)

Class 3, Lab. 2, Credit 4

ITEE-548 D.C. and A.C. Machine Design
Registration #0609-548
The theory, principles of operation and application of A.C. and D.C. rotating machines; the characteristics of shunt, series and compound D.C. motors and generators are explored with torque-speed characteristics, power efficiency and applications of single phase and three phase motors. (ITEE-402)

Class 3, Lab. 3, Credit 4

ITEE-550 Power Systems I
Registration #0609-550
Basic elements of a power system, energy sources, substation configuration, load cycles, single phase circuits, balanced and unbalanced three phase circuits, power factor correction, and transmission line configurations and impedances are covered. (ITEE-402, SMAT-422)

Class 3, Lab. 3, Credit 4

ITEE-551 Protective Relaying
Registration #0609-551
The physical construction and characteristics of electromechanical relays, short circuit calculation and line, bus, transformer and motor-generator protection are studied. Solid state relays, instrument transformers, and telecommunications and supervisory control are included. (ITEE-402 or equivalent)

Class 3, Lab. 3, Credit 4

ITEE-552 *i* Power Systems II
Registration #0609-552
Voltage regulation and efficiency of transformers, per unit systems, symmetrical components, lightning protection, energy conservation, switching surges, and system voltage regulation are included. Equal area criterion of transient stability are covered. (ITEE-^50)

Class 4, Credit 4

ITEE-554 Electronic Optic Devices
Registration #0609-554
Basic photometry is discussed. Light emitting and light receiving devices are covered with circuits and applications. Optics is introduced with laser theory and fiber-optics.

Class 3, Lab. 2, Credit 4

ITEE-556 Transmission Lines and Filters
Registration #0609-556
General transmission line equation and approximations; lossless transmission line and analysis using the Smith chart; matching stub design for transmission lines; Butterworth filter design principles and applications. (ITEE-402)

Class 3, Lab. 2, Credit 4

ITEE-580 Senior Project
Registration #0609-580
Selected independent study of design project by electrical technology students with the approval of the department.

Class/Lab. as required. Credit 4

Upper-Division Mechanical Engineering Technology

ITEM-301 Engineering Graphics
Registration #0610-301
A basic course in engineering drawing. Topics include lettering, line quality, use of instruments, sketching, orthographic projection, pictorials, sections, auxiliary views, and dimensioning.

Recitation 6, Credit 2 or 3

ITEM-404 Applied Mechanics of Materials
Registration #0610-404
The basic concepts of strength of materials as applied to mechanical design are reviewed in depth. The course includes the study of the concepts of stress and strain, the stress-strain relationship and combined stress. Applications of these concepts to beams, shafts, columns, shrink fits, and curved beams are covered. (ITEM-408, or equivalent)

Class 3, Credit 3

ITEM-405 Applied Dynamics
Registration #0610-405
Examines the principles of kinematics and the basic laws of motion as applied to the design and analysis of mechanical components and systems. (ITEM-404, SMAT-421 or concurrent)

Class 3, Recitation 2, Credit 4

ITEM-406 Dynamics of Machinery
Registration #0610-406
A study of the kinematics and kinetics of machine elements such as gears, cams linkages, and the dynamic balancing of machinery. (ITEM-405)

Class 3, Recitation 2, Credit 4

ITEM-407 Mechanical Engineering Technology Laboratory
Registration #0610-407
A course in mechanical laboratory techniques and the preparation of laboratory reports; experimental work in materials testing, strength of materials, experimental stress analysis, metallurgy, and metalography; individual instruction in the preparation of laboratory reports. (It is intended that students enroll concurrently in ITEM-404 and ITEM-414).

Class 2, Lab. 4, Credit 4

ITEM-408 Introduction to Strength of Materials
Registration #0610-408
Elements of statics and strength of materials. Topics include plane equilibrium, friction, stress, strain, torsion, and the bending of beams. Principles of statics and deflection will be demonstrated.

Class 3, Recitation 2, Credit 4

ITEM-411 Engineering Materials
Registration #0610-411
A study of the physical properties of metallic and non-metallic materials; a survey of manufacturing processes including casting, molding, metal removal, metal forming, and welding; field trips are made to local manufacturing installations. For non-mechanical majors.

Class 3, Lab. 2, Credit 4

ITEM-414, 415 Materials Technology I, II
Registration #0610-414, -415
A two quarter course involving a study of materials, their structure and their characteristics. Topics covered include atomic and crystal structure, phases and phase diagrams, physical properties, corrosion and oxidation, diffusion in metals, recovery, recrystallization and grain growth, age hardening and heat treatment of metals. The effect of processes such as welding on the metallurgy of the part will be examined. Organic and ceramic materials will also be studied. (Prerequisite for ITEM-415 is ITEM-414)

I. Class 3, Credit 3

II. Class 3, Lab. 2, Credit 4

ITEM-425 Statistical Quality Control
Registration #0610-425
The basic concepts of statistics and probability are studied as they apply to quality control, including the study of control charts, sampling procedures, and the planning, organizing, and installation of quality controls in the industrial setting.

Class 3, Recitation 2, Credit 4

ITEM-431 Production Management
Registration #0610-431
A study of modern industrial organization and how it is managed. Techniques of decision making will be studied in problem areas related to manufacturing.

Class 4, Credit 4

ITEM-436 Engineering Economics
Registration #0610-436
This course covers some of the factors involved in the engineering economy. Capital financing and budgeting, depreciation and valuation, risk and uncertainty, break-even studies, replacement costs, and selections between alternatives are typical of the topics covered.

Class 4, Credit 4

ITEM-437 Cost and Value Analysis
Registration #0610-437
The use of decision theory and the nature of man-machine systems in analyzing manufacturing and design projects. Integration of economic factors with design and production criteria. Use of linear programming and computers in performing value engineering analysis. Techniques of estimating costs will be studied and used. (ICSP-205)

Class 3, Credit 3

ITEM-441 Thermodynamics and Heat Transfer
Registration #0610-441
The first and second laws of thermodynamics and their applications. Thermodynamic properties of working fluids including pure substances and ideal gases. The concepts of work and heat, to the basic concepts of heat transfer is also included.

Class 4, Credit 4

ITEM-451 Vibration and Noise
Registration #0610-451
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 and structures. Environmental tests for vibration and shock. Methods of vibration and noise analysis will be demonstrated. (SMAT-422)

Class 4, Credit 4

ITEM-461 Mechanics of Fluids
Registration #0610-461
A study of the fundamentals of fluid statics and dynamics. Applications of the principles of pumps, turbines, flow measurement, pipe flow, and fluid power. (ITEM-441)

Class 3, Credit 3

ITEM-465 Thermofluid Laboratory
Registration #0610-465
Laboratory experiments in thermodynamics, fluid mechanics, and heat transfer. (ITEM-441, 461)

Class 1, Lab. 2, Credit 2

ITEM-470 Numerical Control Applications
Registration #0610-470
The philosophy and use of numerical control in manufacturing. The course will review manual programming, examine different applications of numerical control, and introduce computer assisted programming techniques. Numerical control machine tools will be demonstrated.

Class 4, Credit 4

ITEM-472 Tool Engineering
Registration #0610-472
The selection of tools for production, specification of tools, jigs, fixtures, dies, production type gages, selection of tooling for automatic machines, and determining assembly tooling are studied.

Class 3, Lab. 2, Credit 4

ITEM-480 Methods Analysis
Registration #0610-480
Principles and applications of basic methods and techniques for improvement of the worker-job-time relationship, job standards and recording, and work-space design for efficient use of labor.

Class 3, Recitation 2, Credit 4

ITEM-490 Production Planning
Registration #0610-490
An introduction to plant design, problems in factory planning, preparation of plant layout, quantitative tools used in solving layout problems, common problems in plant layout, and work simplification principles and practice. (ITEM-480)

Class 3, Recitation 2, Credit 4

ITEM-491 Material Control
Registration #0610-491
The fundamental principles in the control of industrial production in relation to forecasting purchasing, inventory, production planning, routing, and scheduling.

Class 4, Credit 4

ITEM-499 Mechanical Technology Co-op
Registration #0610-499

Class 0, Credit 0

ITEM-506 Machine Design
Registration #0610-506
The study of the static and dynamic failure of machine elements and the design and analysis of fasteners, springs, shafts and bearings. (ITEM-405)

Class 3, Recitation 2, Credit 4

ITEM-507 Design Practice
Registration #0610-507
Introduction to design codes such as ASME Boiler and Pressure Vessel Code, ASTM Standards, National Electrical Code, and individual study of a design problem; the study of the use of these engineering codes and standards in design.

Class 3, Recitation 2, Credit 4

ITEM-508 Special Topics in Machine Design
Registration #0610-508
The study of topics such as clutches, brakes, couplings, belts, chains and/or vibrations in machinery.

Class 3, Lab. 2, Credit 4

ITEM-514 Special Topics in Material Forming
Registration #0610-514
A study of the principles of material shaping; the effects of temperature, friction, and other factors affecting tool life, machinability and formability will be examined.

Class 3, Lab. 2, Credit 4

ITEM-521 Logic Control Systems
Registration #0610-521
The analysis and design of logic control systems using Boolean algebra. Emphasis is placed on the control of machines with fluid and relay logic. Introduction to electronic programmable controls. The concepts of ordinary and timed sequence control and machine protection are covered. Logic control systems will be demonstrated.

Class 4, Credit 4

ITEM-530 Instrumentation
Registration #0610-530
A basic approach to calibration and use of pressure, temperature, flow, humidity, and liquid level measurement instruments. Techniques of test, calibration, and proper use of instruments will be demonstrated.

Class 4, Credit 4

ITEM-535 Analog Control Systems
Registration #0610-535
An introduction to the basic concepts of analog process control. The feedback control concept, system components, transfer functions of system components, frequency response technique of system design, and optimizing system performance. Actual system performance and system tuning procedures will be demonstrated.

Class 4, Credit 4

ITEM-540 Thermal Technology
Registration #0610-540
Application of thermodynamics to internal combustion engines, compressors, steam cycles, refrigeration, and air conditioning. (ITEM-441)

Class 3, Lab. 2, Credit 4

ITEM-550 Topics in Machine Design
Registration #0610-550 for Electrical Majors
Principles of dynamics and strength of materials as applied to electrical components and subsystems; topics include shaft and bearing design, vibration of rotors, material selection, lubrication, environmental and human factors considerations.

Class 4, Credit 4

ITEM-599 Independent Study
Registration #0610-599
A supervised investigation within a mechanical technology area of student interest. Student must submit written proposal and have it approved prior to registering.

Credit variable (1-4)

ITEM-445 Thermofluid Apparatus
Registration #0610-445
A study of the application, specification, and operation of steam generators, prime movers, heat exchangers, compressors and pumps. Also, performance evaluation of such apparatus and thermal systems; Strategies of energy conservation.

Lecture 3, Lab. 2

ITEM-500, 501 Systems Design Project I, II
Registration #0610-500, -501
An individual student project in systems design. The student integrates his program, co-op experiences, and independent studies in the solution of a system design project and presents his findings in written and oral presentations.

Class 2, Lab. 4, Credit 4

ITEM-522 HVAC Control Systems
Registration #0610-522
An introduction to controls used in association with HVAC systems. The course integrates controls with HVAC processes to arrive at appropriate control and instrumentation systems. The course examines individual instruments, instrument and control systems, monitoring systems, and computer control.

Class 4, Credit 4

ITEM-541 Alternative Energy Applications
Registration #0610-541
The major emphasis of this course is in the area of solar energy. System design of solar hot water and space heating systems, solar-assisted heat pumps. Other alternative sources of energy are also discussed; wind energy, and solid waste.

Class 4, Credit 4

ITEM-442 Heat Transfer
Registration #0610-442
A first course in heat transfer. The theory and application of the fundamentals of heat conduction, convection, and radiation. The design and applications of heat transfer apparatus.

Class 3, Lab. 2, Credit 4

ITEM-480 Methods Analysis
Registration #0610-480
Principles and applications of basic methods and techniques for improvement of the worker-job-time relationship, job standards and recording, and work-space design for efficient use of labor.

Class 3, Recitation 2, Credit 4

ITEM-490 Production Planning
Registration #0610-490
An introduction to plant design, problems in factory planning, preparation of plant layout, quantitative tools used in solving layout problems, common problems in plant layout, and work simplification principles and practice. (ITEM-480)

Class 3, Recitation 2, Credit 4

Community/Junior College Relations

Note: Graduate courses applicable to the MS in business technology are listed under College of Business. A more detailed statement of course objectives, assumed prior knowledge, and topics to be covered is available through the CCJCR office.

IJCG-701 The Two-Year Colleges
Registration #0604-701
The study of the philosophies, organizations, developments, finance, goals, curricula, and spirit of the two-year college.

Credit variable (1-3 credits)

IJCG-702 Teaching, Learning, Content,
Registration #0604-702 & Environment
Advising/counseling relationships, learning styles, student activities, motivations, developmental education, and the implications of the “open door" policy are investigated.

Credit variable (1-3 credits)

IJCG-703 **Management of Learning**
Registration #0604-703
Systems of curriculum planning, and cognitive styles, goals, objectives, evaluation, measurement, and productivity are studied as they relate to the accountability of faculty, students, and administration.

Credit variable (1-4 credits)

IJCG-704 **Instructional Techniques**
Registration #0604-704
To develop professional competence in direct applications and uses of various learning styles, including television, special audiovisuals, prepared lectures, seminars, computer assisted instruction, and programmed learning.

Credit variable (1-4 credits)

IJCG-750 **Seminar**
Registration #0604-750
This is a series of interdisciplinary discussions led by course participants from different teaching disciplines and outside resource persons. The topics concern the challenges involved in teaching, and in educational planning, leading to a better understanding of the total learning by the two-year college students.

(All degree candidates should enroll once in Seminar).

Credit 2

IJCG-752 **Goal Projections and New Developments**
Registration #0604-752 **in Selected Career Disciplines**
This is a series of specialized seminars on new knowledge, trends, and projected competency goals for different career curricula. Each scheduled section of this course will concentrate on an identified cluster of associate degree-certificate programs.
The participants will understand the current and projected knowledge and be able to apply such information to their own teaching.

Credit 2

IJCG-760 **Collective Bargaining in**
Registration #0604-760 **Community Colleges**
An introduction to the collective bargaining process. This workshop course includes various role implications, legal aspects, impact analysis, strategies, preparations, procedures, and mock negotiation sessions.

Credit 2

IJCG-761 **Administration of Technology Education**
Registration #0604-761
This course introduces the student to the various administrative techniques and roles that are expected of technology department chairmen in the two-year colleges. Topics such as management by objectives, human relations, budgeting, equipment and facility planning, union contracts and negotiating are included. Other topics may be included according to the needs and desires of the class. Guest lecturers and discussion leaders will be invited to address the class as appropriate.

Credit 4

IJCG-840 **Internship**
Registration #0604-840
An individual arrangement with an appropriate community or junior college will be made for those persons not having sufficient experience. This will provide definite teaching assignments and responsibilities, together with participation in other faculty functions, including advising, committee work, planning, and student evaluation on a full semester or term basis at a two-year college. Supervision, assistance, and evaluation will be provided by a mentor in the participating college and by the CCJCR.

Credit 3 to 6

IJCG-850 **Special Projects**
Registration #0604-850
This course provides for independent study, investigation, or research activity in subject matter areas not formalized by the Center's program, but having specialized value to the field of community college teaching. Projects may be directed at teaching, curriculum development, or instructional technology. Proposals require approval by the director.

Credit variable (1-6)

Engineering Technology

IJCT-705 **Thermodynamics**
Registration #0606-705
The first and second laws of thermodynamics are applied to fundamental problems in mechanical engineering technology.

Credit **4**

IJCT-707 **Engineering Concepts**
Registration #0606-707
A special graduate level course to update knowledge in statics and dynamics of rigid bodies. Modern mathematical techniques, i.e., vectors, matrices, and Cartesian tensors are used.

Credit **4**

IJCT-708 **Engineering Technology Analysis**
Registration #0606-708
A comprehensive review of differential and integral calculus. Other topics included are partial differentiation, multiple integrations, dot product, cross product, multiple integration, solution of first and second order differential equations; LaPlace transforms and Fourier series. The course provides the mathematical background needed by engineering technology faculty. Selection of topics to be emphasized is based on the preassessment of course participants' understanding. This course is a prerequisite for most other courses in the IJCT series.

Credit **4**

IJCT-710 **Science and Technology of Materials**
Registration #0606-710
The intent of this course is to develop in the student an understanding of the properties of crystalline and non-crystalline materials, metals, alloys, polymers, ceramics, and glass, based on their micro or macro structures.

Credit 3

IJCT-711 **Microelectronics**
Registration #0606-711
Principles of physical basis of active and passive solid state devices are introduced; manufacturing processes of assembly of passive circuit package; discussion of thick/thin film circuit techniques, hybrid circuit assembly, and integrated circuit techniques.

Credit **3**

IJCT-713 **Computers in Engineering Technology I**
Registration #0606-713
Introduction to digital computer programming and the application of computer programs to the solution of technical problems in engineering technology education. Programming languages such as FORTRAN, BASIC, and APL are introduced and used as appropriate based upon the pre-assessment of student knowledge. Prerequisite knowledge should include mathematics through college calculus.

Credit **4**

IJCT-714 **Computers in Engineering Technology II**
Registration #0606-714
This course continues the study, use, and application of digital computers to solve engineering technology problems. Additional programming languages and programming techniques are included. Programming assignments are pertinent to the student's area of specialty.

Credit **4**

IJCT-715 **Electromechanical Systems I**
Registration #0606-715
Introduction to the concepts and principles of electromechanical systems and components. The underlying unifying concepts of electrical, fluid, mechanical and thermal systems are examined. Various types of transducers such as temperature, displacement, force, electropneumatic and electrohydraulic are studied. Other topics include thermistors, thermocouples, strain gauges, control valves, open and closed loop systems and digital systems.

Credit 3

IJCT-716 Electromechanical Systems'll
Registration #0606-716
The study of the major components and subsystems required for the operation of numerically controlled machines and other industrial applications of electromechanical technology.

Credit 3

IJCT-717 Electrical Measurements
Registration #0606-717
This course presents the various fundamental electrical measuring devices, instruments, and transducers which the mechanical engineer is likely to encounter. Basic principles and applications are stressed.

Credit 3

IJCT-718 Applications of Linear Integrated Circuits
Registration #0606-718
Linear integrated circuits including operational amplifiers, voltage regulators, and commercial amplifiers. Examination and analysis of manufacturer specifications for standard units. Includes numerous examples of practical applications.

Credit 3

IJCT-719 Communication Theory
Registration #0606-719
To provide the student with the basic principles and applications of communication theory in system design.

Credit 3

IJCT-720 Integrated Physics
Registration #0606-720
The course objectives include the synthesis and integration of a wide variety of physics topics that are the basis of electrical, mechanical, and optical technology, and the understanding of their common concepts, structures, and terminology.

Credit 4

IJCT-721 Digital Fundamentals
Registration #0606-721
Boolean algebra with extensive applications to digital systems.

Credit 3

IJCT-722 Digital Integrated Circuits
Registration #0606-722
A comprehensive introduction to modern techniques of digital logic circuit design incorporating MSI and LSI devices. Specific devices to be included are multiplexers, demultiplexers, read-only memories, programmable read-only memories and programmable logic arrays; introduction to microprocessors; the 6800 system as well as the 8080 system will be examined. (0606-721 or the equivalent)

Credit 3

MCT-725 Numerically Controlled Machines
Registration #0606-725
Basic principles and capabilities of N/C; N/C machine and its controls; increment and absolute systems, point-to-point and continuous path systems, manual programming; use of computers and programs for N/C, N/C turning; design criteria and managing of N/C; non-machining applications.

Credit 3

IJCT-727 Advanced Electrical Measurements
Registration #0606-727
A continuation of Electrical Measurements (IJCT-717) stressing current industrial applications, electronic instrumentation, and troubleshooting. Biomedical applications will be included.

Credit 3

IJCT-728 Active Filter Design
Registration #0606-728
This course deals with modern approaches to the design of frequency selective filters. Concepts of transfer functions, poles and zeros, and graphical evaluation of frequency response are discussed. Following this, the classical filter approximations (e.g., Butterworth, Chebyshev, and Elliptic) are developed for low pass, band pass, and high pass passive designs. The final portion of the course includes the design of active R-C filters using operational amplifiers

Credit 3

IJCT-730 Electric Power Transmission
Registration #0606-730
A survey of modern power systems including symmetric components, transmission line constants, relaying and control techniques, system stability and economic operation. The impact of large power solid state electronics and ecological studies is discussed.

Credit 3

IJCT-731 Mechanical Design
Registration #0606-731
The study of the static and dynamic failure of machine elements; the design and analysis of fasteners, springs, shafts, bearings, gears, clutches, and brakes.

Credit 3

IJCT-732 Manufacturing Organization
Registration #0606-732 and Management
The study of the principles of manufacturing organization and management as they relate to teaching the material in the two-year college.

Credit 3

IJCT-751 Engineering Technology Seminar
Registration #0606-751
A series of discussions to analyze and propose solutions for instructional problems peculiar to teaching technical courses. Guest discussion leaders are invited at appropriate times. Individual projects are assigned.

Credit 1

IJCT-770 Minicomputers in Engineering Technology
Registration #0606-770
An introduction to minicomputer hardware and software. Includes practical examples of suitable applications in community college engineering technology education. Emphasis on programming, basic architecture and interfacing, and system maintenance. A working knowledge of basic digital electronics is assumed.

Credit 4

Career Information Specialist

IJCC-741 The Nature of Work
Registration #0615-741
This course deals with historical analyses of work, diverse and changing work-leisure values, economic and political factors, and the influence of science and technology. Topics include: work from the artisan through cottage industries to the large conglomerates and multinational companies of today, the advance of science and technology will be analyzed in terms of its impact on society as a whole and work in particular, the impact of industrialization, business cycles, new economic and political philosophies and their relationship to the changing concepts and possibilities of work. The changing nature of work in post-industrial America will be analyzed.

Credit 2

IJCT-742 Career Decision Making Concepts
Registration #0615-742
Based upon prior knowledge of basic sociological and psychological constructs, this course concentrates on the processes and influences involved in choices regarding careers. The relative and collective impacts of peers, teachers, friends and relatives, immediate family, and professional advisors are analyzed. Additional course goals include applications of processes such as socialization; acculturation; assimilation; status and role playing; and perception to related activities such as career education-orientation-advising. Current psychological research relating personality/self concepts/motivation to career decision making will be studied. A special topic involves the problems of communicating information on emerging careers to individuals to effect real and valid perceptions.

Credit 3

IJCC-743 Education/Business/Industry Interrelationships
Registration #0615-743
A study of the interrelationship of the world of formal education to the business, industrial, and labor communities. Constraints, problems, and values of cooperative effort will be studied in relation to organizations of varying size. Elementary, secondary and post-secondary education, differing size business organizations and industrial groups that involve differing levels of technical specialization are studied.

Credit 2

IJCC-744 Legal Aspects of Career Plans
Registration #0615-744
The principal goal is that the participant will have a sufficient knowledge of general law and government agency rulings that control career decisions. Topics include: constitutional law, affirmative action, union affiliation for closed and open shops, exempt and non-exempt employment, collective bargaining, the several labor departments and their functions, job qualifications and requirements, handicapped persons, civil service regulations, laws relating to various cooperative education arrangements, and employment related liability. The student will then examine conflicts between the law and selected practices or procedures. (Assumed prior knowledge of the nature of constitutional, statutory, civil and common law.)

Credit 2

IJCC-745 Career Concepts: Production
Registration #0615-745

Credit 3

IJCC-746 Career Concepts: Commerce
Registration #0615-746

Credit 3

IJCC-747 Career Concepts: Services
Registration #0615-747

Credit 3

These three courses form a single set and are separated only to facilitate registration and scheduling flexibility.

Each of these three courses concentrates on particular careers. Production includes manufacturing, construction, mining, skilled trades, design and engineering related fields, and food processing and the field of agriculture, fisheries, etc. Commerce covers general business, banking and finance, sales and advertising, communications, hospitality and tourism, retail and wholesale distribution and related fields. Service includes allied health careers, education, government and civil service, law and criminal justice careers, and other service careers.

Each course is designed to present a foundation view of several types of a particular employer. Investigated will be systems of career opportunities, management, personnel policies, employer/employee relations, required training/educational levels, manpower long-range projections, philosophies, in-house education and training, competitive relationships, national/international affiliations, and civic/humanitarian expectations.

IJCC-748 Information Retrieval Systems in Career Planning
Registration #0615-748
The primary goal is the ability to use several data based computer systems for the storage and retrieval of career information, this includes a sufficient understanding of the computer systems, languages and dictionaries for efficient utilization.

Additional goals are an awareness of other systems based upon media and print materials, and the ability to evaluate various systems. (Satisfaction of all foundation studies)

Credit 2

IJCC-749 Manpower Forecasting Fundamentals
Registration #0615-749
Two different purposes that depend on a common base are goals for this course. The common base is an understanding of the techniques, theories and limitations of manpower forecasting as it applies to numbers in current occupations and to the probabilities of emerging careers.

The two purposes are: (1) the ability to provide, as a generalist having a broad knowledge of different careers, assistance to discipline specialists in feasibility studies for new educational programs, and (2) to assist people in making decisions in those careers for which insufficient information exists. The ability to assist people in making decisions about the pursuit of a career that is projected to be available several years later will be studied in-order to develop a uniform and responsible judgement in those areas where probability statements are extremely important. (Satisfaction of all foundation studies.)

Credit 4

IJCC-755 Career Internship—
Registration #0615-755 Project/Experience
This is a variable credit (1 to 5) course that is required of all students unless they have had sufficient approvable experience as a Career Information Specialist. It would be an opportunity to practice one or more of the defined functions of a Career Information Specialist under RIT supervision.

Credit variable (1-5 credits)

IJCC-756 Career Internship—
Registration #0615-756 Business/Industry
This is a variable (1 to 5) credit course, and is an elective that is available only when satisfactory arrangements can be made to function as a specialist in business/industry. It is possible this would only be available for full-time students.

Credit variable (1-5 credits)

IJCC-757 Career Internship—
Registration #0615-757 Services/Education
This is identical to the 756 internship except that it applies to practice in educational and service occupation fields.

Credit variable (1-5 credits)

IJCC-762 Career Education Seminar—Women
Registration #0615-762
An elective course for students in Career Information concentrating on the ability to provide effective counseling for women who wish to enter non-traditional career fields. Case studies, first person presentations, readings, media and discussions are used to develop the knowledge and skills needed. A project related to the elimination of bias and stereotyping in career counseling materials will be required.

Credit 3

IJCC-763 Career Education Seminar—Handicapped
Registration #0615-763
An elective course for students in Career Information concentrating on the ability to provide effective counseling for handicapped persons who wish to plan and succeed in desired careers.

Credit 3

IJCC-842 Current Issues and Selected Counseling Skills
Registration #0615-842
Different techniques will be explored with their functions as useful skills for a career information specialist, such as group counseling, role-playing, practice in listening, sensitivity and awareness training. The approach or practice for this training will be geared toward special interest groups: minorities, the mature worker, women, etc. Students will be given an opportunity to learn about special problems encountered by these groups.

The specific topics for each section will be selected with a knowledge of critical challenges and the capability needs of the participants. (IJCC-742)

Credit 3

Computer Science and Technology

ICSP-205 Computer Techniques
Registration #0601-205
This course will introduce the student to various facets of computing systems. Concentration will be on the FORTRAN IV language and application programs, documentation, and working knowledge thereof. For non computer science majors.

Class 3, Credit 3

ICSP-209 Introduction to Data Systems
Registration #0601-209
Introduction to the capabilities and characteristics of data processing equipment in a business environment. Topics include the characteristic roles of systems analyst, programmer, and operator in the development of information systems; unit record and computer based systems; data communication systems. Lab work includes operation of some unit record equipment and computer programming.

Class 4, Credit 4

ICSP-215 Programming Language—FORTRAN
Registration #0601-215
A study of FORTRAN programming techniques and applications. Topics include FORTRAN constants, variables, expressions, functions, logical operations, storage allocations, statements, I/Q manipulation, program structures, subprograms, plotting, debugging, diagnostic methods and applied problem solving methods. For computer science majors. (ICSS-202)

Class 4, Credit 4

ICSP-220 FORTRAN Programming for Engineers
Registration #0601-220
A study of applied computer programming techniques Topics include FORTRAN programming, numerical methods and applications of computer to engineering problems. (EEEE-201)

Class 4, Credit 4

ICSP-301 COBOL Programming
Registration #0601-301
COBOL programming techniques and applications. Topic? include COBOL coding methods, data processing and sequential file manipulation, table look-up, SORT and SEARCH verbs, introduction to the concept of modular and structured programming, COBOL debugging and editing facilities, establishment of documentation standards, case studies. (ICSS-200 or ICSS-202)

Class 4, Credit 4

ICSP-302 Computer Applications in
Registration #0601-302 Engineering Problems
Fundamentals of programming in the BASIC language: the applications of circuit analysis programs to the solution of electrical circuits.

Class 1, Credit 1

ICSP-304 Advanced COBOL Programming
Registration #0601-304
Advanced COBOL programming techniques and applications; topics include magnetic tape and disc file processing techniques using COBOL, subroutines, overlay and segmentation, report writer, core dump analysis, modular and structured programming techniques, coding optimization techniques, case studies. (ISCP-201)

Class 4, Credit 4

ICSP-305 Assembly Language Programming
Registration #0601-305
A study of assembly language programming methods. Topics include computer organization, assembly process, assembly coding, addressing, binary arithmetic, relocatability, storage allocation, subroutine linkage, looping and address modification, character manipulation, bit manipulation, floating-point arithmetic, decimal instruction set, some system I/O, macros and debugging techniques. For computer science and technology majors. (ICSP-215 or ICSP-301)

Class 4, Credit 4

ICSP-306 Advanced Assembly Language
Registration #0601-306
A study of more advanced assembly language programming techniques, macros, macro generation, conditional assembly, system macros, program linkage, re-entrant and recursive routines. I/O programming at the interrupt level on some machines. (ICSP-305)

Class 4, Credit 4

ICSP-308 Structured Programming
Registration #0601-308
A study of techniques in structured programming. Topics include deficiencies in conventional programming methods, modular programming, program structures, structured programs, top down programming and comparative studies in programming approach. (High-level language, and an assembly language)

Class 4, Credit 4

ICSP-318 APL Programming Techniques
Registration #0601-318 & Applications
APL programming techniques and applications. Topics include APL programming APL report formating features, file I/O subsystem, graphic I/O, scientific and business systems design using APL case studies. (A programming course in FORTRAN or BASIC)

Class 4, Credit 4

ICSP-330 PL/1 Programming
Registration #0601-330
A study of PL/1 language coding and programming techniques. Topics include record I/O, file processing, indexed and regional file processing, PL/1 application in scientific problems and functions and subroutines. (A high level language)

Class 4, Credit 4

ICSP-331 Advanced PL/1 Programming
Registration #0601-331
A study of more advanced PL/1 programming techniques. Topics include record I/O, file processing, indexed and regional file processing, PL/1 application in scientific problems and programming projects. (ICSP-330)

Class 4, Credit 4

ICSP-350 Programming Language Concepts
Registration #0601-350
The concepts and syntactic structure of languages used in computer programming are analyzed by a study of several of the more sophisticated languages in' use. Semantic problems will be considered. Programs will be written in selected languages. (ICSS-320)

Class 4, Credit 4

ICSP-432 Computer Applications in
Registration #0601-432 Analysis and Design
A study of techniques of using computers in the field of physical science. Topics include review of programming language, hardware specification and selection, interface problems, software availability and selection, graphical methods, simulation methods and case studies. Projects and hands-on experience will be required. This course is designed for non-computer science majors. (ICSP-205 or equivalent)

Class 4, Credit 4

ICSP-532 Computer Applications in Social
Registration #0601-532 and Behavioral Sciences
A study of computer techniques applied to social and behavioral sciences. Topics include language selections, matrix manipulation, statistics (basic), analysis of variance, correlations and regression, distribution, factor analysis, econometrics and profit analysis packages. A project relating to individual fields of interest will be required. (ICSP-205, SMAM-309)

Class 4, Credit 4

ICSS-200 Survey of Computer Science
Registration #0603-200
Basic concepts and overview of computer science for non-computer science majors. Topics include historical development; algorithms, flowcharting, programming; exposure to assembly language; hardware concepts, including a functional description of CPU operations; data representation and manipulation; software concepts, including compilers, assemblers, and operating systems; and the application of the computer to various disciplines.

Class 4, Credit 4

ICSS-202 Introduction to Computer Science
Registration #0603-202
Basic concepts and overview of computer science for computer science majors. Topics include those for ICSS-200 with the addition of more rigorous treatment of number systems and machine organizations. A structured programming language PASCAL is emphasized.

Class 4, Credit 4

ICSS-230 Discrete Structure
Registration #0603-230
A study of discrete mathematical foundations; topics include propositional logic, set algebra, functions and relations, Boolean algebra and Boolean functions, permutations and combinations, vectors and matrices, graphs, digraphs, trees and strings; applications of these structures to various areas of computer science.

Class 4, Credit 4

ICSS-310 Information Systems Design
Registration #0603-310
Computer oriented information systems design. Topics include data organization, file organization, structure and access methods, file device selection, input/output file design, forms design, decision tables, introduction to data base concepts, establishment of programming and documentation standards, application of advanced COBOL, case studies. (ICSP-209, ICSP-301)

Class 4, Credit 4

ICSS-311 Information Systems Analysis
Registration #0603-311
Computer oriented information systems analysis. Topics include problem definition, problem-analysis, fact gathering and analysis techniques, systems design, interviewing techniques, cost analysis system implementation and testing techniques, system evaluation, case studies. (ICSS-310)

Class 4, Credit 4

ICSS-315 Digital Computer Organization
Registration #0603-315
Review of binary numbering systems and arithmetic, complement notation, instruction and data representation; logical design fundamentals, including review of Boolean functions and computational logic; hardware fundamentals including logic gates, flip-flops, adders, data bases, and memory technology; machine organization of CPU memory, input/output and control unit; functioning and interfacing including instruction fetch/execute cycle, data flow and control, cycle stealing and instruction interpretation; introduction to interrupts, memory protection features, multiprocessors, concepts of microprogramming and other advanced architectural concepts. This course replaces ICSS-210. (ICSS-230, ICSS-305)

Class 4, Credit 4

ICSS-320 Data Structure Analysis
Registration #0603-320
Information structures—linear lists, stacks, queues, sequential allocation, linked allocation, circular lists, doubly linked lists, arrays and orthogonal lists; trees, traversing binary trees; lists and garbage collection; multilinked structures; dynamic storage allocation. (ICSP-305)

Class 4, Credit 4

ICSS-321 Sorting and Searching Techniques
Registration #0603-321
A study of sorting and searching principles and techniques. Topics include internal and external sorting, table look-up, hash coding and other methods, comparative studies of various techniques and the relations between storage media, and physical file structure. (ICSS-320)

Class 4, Credit 4

I CSS-340 Finite State Machines
Registration #0603-340 and Automata
Principles of finite state machines and automata; topics include finite state models, machine capabilities, descriptive methods, decomposition methods, regular expressions, bilateral analysis, bilateral synthesis, sequential iterative systems and space-time transformations. (ICSS-230, ICSS-315)

Class 4, Credit 4

ICSS-355 The Human Side of
Registration #0603-355 Computers
Survey of issues of concern regarding the interaction of computer systems and humans. Participants will be expected to prepare a major study, including proposed solutions, for at least one problem. Topics include: the strengths and weaknesses of computers; the effect of, and the computer's role in change; the effect of organizations, the management process, standardization, organizational structure, and automation; effect on individuals, the "priesthood of the machine", computer assisted instruction, medical uses; effects on society, information banks, privacy, and other legal questions, law enforcement and other governmental uses, the computer utility, the cashless society. (ICSS-200 or ICSS-202) -

Class 4, Credit 4

ICSS-370, 371 Computer Graphics in Filmmaking
Registration #0603-370, -371
This course will introduce the filmmaking student to the theory and application of computer graphics in filmmaking. Concentration will be on a high-level programming language, a graphical display device, and a graphical software package. Topics will include a discussion of theoretical computer graphics, in particular 2-D and 3-D picture representation and transformations, applications in the production of logos and short narrative film sequences, and the computer as an artistic dimension.

Class 4, Credit 4

ICSS-400 Logical Design
Registration #0603-400
Digital computer logic design. Topics include review of switch theory, sequential circuit analysis, sequential circuit synthesis, error detection, error correction network, speed-up techniques, parallel and serial approaches, interface techniques and comparative study of digital computer architecture. (ICSS-315)

Class 4, Credit 4

ICSS-420 Data Communication Systems
Registration #0603-420
Data based systems, data communication systems. Topics include the role of the data base; communication techniques; common carrier implications, tariffs, exchanges, concentrators, multiplexors, buffering; network analysis, cost and design; software considerations. (SMAM-309, third year standing in computer science and technology)

Class 4, Credit 4

ICSS-430 Numerical Methods
Registration #0603-430
Numerical methods using computers. Topics include error analysis, power series calculation of functions, roots of equations, solution of linear simultaneous equations, numerical integration, and interpolation and curve fitting. The computational aspects rather than mat/iematical development will be emphasized. (SMAM-251, 252 or SMAM-214 and ICSP-215 or ICSP-205)

Class 4, Credit 4

ICSS-440 Operating Systems
Registration #0603-440
A general survey of operating system modules. Topics include linkers and loaders; I/O and filesystems; memory management, paging, segmentation, virtual memory; interrupt handling, resource allocation; scheduling algorithms; deadlocks; multiprogramming and multiprocessing conflict resolution; process definition, communication, and projection. Several existing operating systems are examined. (ICSS-320, ICSS-315)

Class 4, Credit 4

ICSS-450 Computing Management
Registration #0603-450
The application of management principles to managing a data processing installation. Topics include organization, personnel selection and staffing, economic analysis including equipment and software selection, leasing, and purchase, installation layout, physical, software, and file security, management controls and auditing, maintenance, and legal aspects. A major project in equipment selection and installation will be assigned. (Must be fourth or fifth year computer science major)

Class 4, Credit 4

ICSS-465 Introduction to Management
Registration #0603-465 Information Systems
A study of the analysis, design, and implementation of management information systems; various approaches to system analysis, including inquiring systems and the views of C. West Churchman; a survey of proposed and actual MIS designs for general and specific applications, such as accounting, financial and inventory systems, and consideration of the ‘‘total information system;’’ implementation aspects, such as decision tables, data bases and data base management systems, security, financial considerations, and testing. (ICSS-311)

Class 4, Credit 4

ICSS-480 Formal Languages
Registration #0603-480
Computers formal language principles. Topics include context free, context sensitive grammar, regular expressions; turing machines, introduction to unsolvability and computability. (ICSS-340)

Class 4, Credit 4

ICSS-485 Data Base Concepts
Registration #0603-485
Introduction to the concept of data base. Topics include historic development of data bases; data organization and structure; data security, recovery, relationship and retrieval; system design using the Xerox EDMS; comparison of the data base approach with traditional file organization and access methods; a study of other existing data bases such as IMS and TOTAL. (ICSS-320)

Class 4, Credit 4

ICSS-510 Systems Workshop
Registration #0603-510
Commercial projects utilizing COBOL and the principles of systems analysis and design; the projects will be completed by individuals or small groups. (ICSS-311)

Class 4, Credit 4

ICSS-515 Analysis of Algorithms
Registration #0603-515
This course should be designed to teach the mathematics necessary to properly analyze the computational effort of a given algorithm. Specific algorithms should be analyzed and then improved. (Advanced computer science standing)

Class 4, Credit 4

ICSS-525 Assemblers, Interpreters,
Registration #0603-525 and Compilers
A survey of the three basic programming language processors—assemblers, interpreters, and compilers. Topics include design and construction of language processors, formal syntactic definition methods, parsing techniques, and code generation techniques. Laboratory work includes actual construction of language processors. (ICSS-320)

Class 4, Credit 4

ICSS-540 Operating Systems Laboratory
Registration #0603-540
Application of the principles covered in ICSS-440; development of a small operating system and a study of its functional characteristics; special topics include I/O programming, interrupt handling, resource allocation and virtual system concepts; laboratory emphasis. (ICSS-440)

Class 4, Credit 4

I CSS-545 Microprogramming
Registration #0603-545
A study of principles and applications of microprogramming. Topics include historical review, read-only storage (ROS), work organization, encoded control, ROS timing, ROS storage capacity and cost, advantages, disadvantages, writable control storage and levels of microprogramming in existence today. (ICSS-315)

Class 4, Credit 4

ICSS-550 Review of Computer Science
Registration #0603-550
Review of advances in computer science which have occurred in the last few years—designed to give graduating or upperclass students an introduction to recent technological and theoretical advances through readings in the current literature. Normally taken during the last quarter of school. (Must be fifth year computer science and technology major)

Class 4, Credit 4

ICSS-560 Compiler Construction Laboratory
Registration #0603-560
Design of full-scale processors for the purpose of language translation; projects to be completed in a structured environment in areas of parsing, code generation, code optimization, and language design. (ICSS-525)

Credit 4

I CSS-575 Minicomputer Systems and
Registration #0603-575 Applications
A study of minicomputer hardware architecture, logical design, system interface, software organization, operating systems and applications in various areas. Hands-on experimentation on the PDP 11/10 and Microdata 1600D dual processing system is emphasized in this course. (Fourth year computer science and technology major)

Class 4, Credit 4

I CSS-580 Systems Programming
Registration #0603-580
A study of computer system programming techniques. Topics include system specifications, system generations, utility, service routines, operating systems, language processors, resources allocation, system protection and system efficiency optimization.
(ICSS-525, ICSS-440)

Class 4, Credit 4

ICSS-585 Systems Programming Laboratory
Registration #0603-585
A follow-up study of Systems Programming to provide actual experience on a computer system. (ICSS-580)

Class 4, Credit 4

I CSS-590 Seminar in Computer Science
Registration #0603-590
Current advancement in computer science. Topics selected include telecommunications, operating systems, sorting, systems analysis, virtual storage, microprogramming and others. (Fourth year computer science and technology major.)

Class 2-4, Credit 2-4

ICSS-599 Independent Study
Registration #0603-599
Selected topics between a student and a faculty member. (Fifth year computer science and technology major with an average higher than 2.5)

Class 2-4, Credit 2-4

Information Science

ICSI-722 Library Automation and Management
Registration #0616-722
This course summarizes the computer techniques applied to library automation and the study of management techniques and problems in a modern automated library. Case studies in current library systems will be included. Management models in selected libraries will be discussed. (Graduate standing in Information Science, Computer Science or consent of instructor.)

Credit 4

ICSI-733 Information Media and Design
Registration #0616-733
A study of current information media and their design. Topics include microfilm system, video system, computer input and out devices, computer interface with media devices, and system design concepts and techniques in the application to libraries and information centers. (Graduate standing in Information Science or Computer Science or consent of instructor.)

Credit 4

Graduate Courses
Computer Systems Management

ICSM-700 Review of Programming Languages
Registration #0611-700
A review of programming techniques and the applications of FORTRAN and assembly language for the incoming graduate student with deficiencies in programming.

Credit 4

ICSM-703 Data Management Concepts
Registration #0611-703
A study of computer data management concepts. Topics include data representation, data structures, searching and storage techniques, file structure and maintenance, data communication and generalized data management systems.

Credit 4

ICSM-710 Computer Systems Software
Registration #0611-710
A study of the wide spectrum of developing and existing system software. Topics discussed include supervisors, monitors, compilers, utility programs, I/O executives, communication processing systems, application programs, and minicomputer operating systems. Detailed studies in IBM and Xerox systems will be made and comparative studies between systems and the availability of various systems will also be covered.

Credit 4

ICSM-715 Computer Systems Hardware
Registration #0611-715
A study of the characteristics of computer system hardware. The topics discussed include speed, memory size, architecture, expandability, maintenance problems and software backup. Both case studies and comparative studies will be made to large, medium, and small scale computers, as well as to mini computers.

Credit 4

ICSM-740 Computer System Personnel and Management
Registration #0611-740
A study of computer installation personnel and management structure. Topics include system programmer and system analyst qualification and selection, applications programmer qualification and selection, responsibility assignment, scheduling procedures, cost analysis, performance evaluation quality control and other behavioral aspects.

Credit 4

ICSM-765 Advanced Computer Utilization Techniques
Registration #0611-765
A study of advanced computer utilization techniques. Topics include resource allocation of available software in business, mathematical, and engineering application. Information storage and retrieval techniques as well as characteristics of some more frequently used programs are studied.

Credit 4

ICSM-790 Seminar
Registration #0611-790
Topics discussed include management problems, production problems, maintenance problems, hardware and software system problems, and invited topics given by Computer Center directors.

Credit 4

ICSM-799 Independent Study
Registration #0611-799

Credit variable (2-4)

Graduate Courses
Computer Science

ICSS-610 EDP Auditing
Registration #0603-610
A study of the techniques and approaches used to audit computer data centers and systems. Topics include the methodology and tools of EDP auditing, internal departmental controls, program controls, input/output controls, data security, physical security, computer hardware controls and data communication control.

Credit 4

ICSS-620 Computer Architecture
Registration #0603-620
A study of computer architectural analysis and design. Topics include review of basic theories, hardware technology, parallel and distributive logic, asynchronous and synchronous machines and case study. (ICSS-315)

Credit 4

ICSS-621 Microprocessor and Microcomputers
Registration #0603-621
A study of microprocessors, microcomputers and their applications. Topics include microprocessor hardware, microcomputer organization, software, microcomputer programming, interface techniques and trend of development. Case studies will be provided. Intel 8080 will be extensively studied. Students must have background in assembly language programming and knowledge in microprogramming. (ICSP-305 or equivalent)

Credit 4

ICSS-630 Discrete Simulation
Registration #0603-630
Computer simulation techniques are examined. Topics include abstract properties of simulations, modeling, analysis of a simulation run, and statistics. At least one general purpose simulation language (GPDS) will be taught. Each student will be required to write at least one simulation program, run it on a digital computer, and present an analysis thereof. (SMAM-309 or equivalent)

Credit 4

ICSS-635 On-Line Information Systems Design
Registration #0603-635
Design of on-line informative systems. Topics include basic on-line system characteristics, design guidelines, hardware requirements, comparison of systems and languages, file organization concepts, the simultaneous access problem, file security and recovery, error recovery, system evaluation, and case studies. (Consent of instructor)

Credit 4

ICSS-636 Data Base System Implementation
Registration #0603-636
Requirements and characterization of generalized data base systems, the role of data base administrator, creation of a general data base, elements of data base management systems, data base management in multi-access environment, survey of data base management systems, selecting a data base management system, projects in data base systems implementation. (ICSS-485)

Credit 4

ICSS-640 Computer Communications Networks
Registration #0603-640
A study of hardware and software principles of computer communication networks. Topics include network configuration and vocabulary, network hardware components, network software components, network technologies, examples of existing networks, network utilization, measurement and evaluation.

Credit 4

ICSS-655 Real-Time Computation
Registration #0603-655
Principles and applied problems in real-time computation. Topics include processor subsystems, communication networks, terminal subsystems, A/D conversion, D/A conversion, interface, noise problems, the major cycle mode, message switching system, throughput rate calculations, system efficiency, and system optimization.

Credit 4

ICSS-670 Computer Graphics
Registration #0603-670
Theory and technology of computer graphics; display devices and processors; display files and transformations; interactive and three-dimensional graphics and graphic systems; graphic languages and systems design.

Credit 4

ICSS-705 Fundamentals of Computing
Registration #0603-705
Computer systems, number representations, arithmetic operations and error analysis, structured programming, recursive programming, systems software, computer architecture and microprogramming. (ICSM-700 or equivalent)

Credit 4

ICSS-706 Foundations of Computing Theory
Registration #0603-706
Principles of computing theory; mathematical logic, set theory, relations; functions, grammars and languages, lattices and Boolean algebra, graph theory. (SMAM-431 or equivalent)

Credit 4

ICSS-715 Computational Complexity
Registration #0603-715
This course is concerned with the mathematical analysis of computer algorithms. Topics include matrix operations, combinatorial algorithms, integer and polynomial arithmetic, NP complete problems, and lower bounds on algorithms involving arithmetic operations. Background in analysis techniques is presumed. (ICSS-706)

Credit 4

ICSS-725 Assemblers, Interpreters and Compilers
Registration #0603-725
A survey of the software processors. Topics include design and construction of programming language processors, relative merits vis-a-vis cost, user demands, ease of modification, conversational /Computing, large scale data reduction, and macro processors. (ICSP-305 or equivalent)

Credit 4

ICSS-726 Deterministic and Probability Models
Registration #0603-726 of Operating Systems
Concurrent processes control, processor scheduling models, computer sequencing problems, auxiliary and buffer storage models, storage allocation in paging systems, memory management of multiprogramming computers. (ICSS-440 and SMAM-352 or SMAM-522)

Credit 4

ICSS-736 Data Base Systems
Registration #0603-736
Data base concepts, information storage structures, data models and data sub-languages, the relational approach, the hierarchical approach, the network approach, data security and integrity, performance and restructuring application and management issues. (ICSS-485)

Credit 4

ICSS-746 Information Storage and Retrieval
Registration #0603-746
Information structure and file organization; dictionary and thesaurus construction, utilization and maintenance; statistical and syntactic language analysis; question-answering systems; systems evaluation.

Credit 4

ICSS-750 Computability
Registration #0603-750
This course examines the theory of computation as it relates to computable functions. Topics include finite state machines, Turing machines, recursive function theory, and Post's symbol manipulation systems. The limitations of the notion of effective computability are examined. (ICSS-706)

Credit 4

ICSS-752 Coding Theory
Registration #0603-752
Study of error correcting codes. Topics include algebraic structure of group codes, linear switching circuits, cyclic codes and the decoding problem. (ICSS-706)

Credit 4

ICSS-756 Theory of Parsing
Registration #0603-756
Application of theoretical concepts developed in formal language and automata theory to the design of programming language and its processors; syntactic and semantic notation for specifying programming languages; theoretical properties of some grammars; general parsing; non-backtrack parsing; and limited backtrack parsing algorithms. (ICSS-480)

Credit 4

ICSS-760 Compiler Construction
Registration #0603-760
Language definition, lexical analysis, syntactic analysis, storage allocation and management, code generation, code optimization, diagnostic generation, bootstrapping. (ICSS-480 and (ICSS-525)

Credit 4

ICSS-775 Minicomputer Systems and Applications
Registration #0603-775
A study of minicomputer hardware architecture, logical design, system interface, software organization, operation systems and applications in various areas. Hands-on experimentation on the PDP 11/34 and Microdata 1600D dual processing system is emphasized.

Credit 4

ICSS-780 Systems Programming
Registration #0603-780
Computer system programming techniques. Topics include system specifications, system generations, utility, service routines, operating systems language processors, resource allocation, system protection, and system efficiency optimization.

Credit 4

ICSS-785 Systems Programming Laboratory
Registration #0603-785
A follow-up study of Systems Programming to provide actual experience on a computer system.

Credit 4

ICSS-790 Seminar
Registration #0603-790

Credit variable 2-4

ICSS-799 Independent Study
Registration #0603-799

Credit variable 2-4

ICSS-890 MS Thesis
Registration #0603-890

Credit variable 4-8

Audiovisual Communications

ICIC-401 **Message Design**
Registration #0612-401
Reviews perception and learning principles as they may be applied to the design of instructional communications. Examines social psychological principles as they relate to attitude change and motivation in learners. Students use design principles and structure messages for different media forms. Required of all students.

Credit 4

ICIC-405 **Audiovisual Seminar**
Registration #0612-405
Permits entering students to discuss in a seminar setting a series of topics related to the field of audiovisual communications, including career choices, academic preparation, and professional growth opportunities. Guest speakers and visits to local media production units will permit personal contact with potential employers. Required of all students.

Credit 2

ICIC-440 **Audiovisual Program Design I**
Registration #0612-440
Students learn how to develop audiovisual materials by using systematic development procedures. The design model for the development of instructional/training materials and the media elements that comprise them focuses on process and analytic skills such as the writing of behavioral objectives and developmental testing. Mastery of skills and techniques rather than theory is emphasized. Required for all students.

Credit 4

ICIC-450 **Audiovisual Program Design II**
Registration #0612-450
The systems approach to audiovisual program design is further developed and used as a basis for a systematic, four-stage process of program identification, design, development, and dissemination. Students design, produce and validate an instructional product by utilizing this systems model. Required for all students. (Prerequisite: ICIC-440)

Credit 4

ICIC-460 **Selection, Storage and Dissemination of**
Registration #0612-460 **Media Resources**
Reviews methods of selecting non-print media resources (such as films, audiotapes, filmstrips, videotapes), methods for proper storage and efficient retrieval of non-print materials, and distribution practices. Examines sources reviews and descriptions which can be used in locating, selecting, and acquiring various media.

Credit 2

ICIC-461 **Visual Information Resources**
Registration #0612-461
Explores the variety of search techniques and strategies for finding visual and pictorial information, evaluating it, and establishing a reference file for use in production. Specific application of these techniques is made to locating sources of original visual (graphic, photographic, print) material as well as prepared visuals in secondary sources such as books. Interpreting and following copyright regulations is discussed.

Credit 3

ICIC-485 **Electronics in AV**
Registration #0612-485
Covers the fundamentals of electricity and electronics, with particular emphasis on applications to audiovisual hardware and electronic systems, especially as related to proper operation and use.

Credit 4

ICIC-490 **Audio Techniques**
Registration #0612-490
Students review principles of sound recording and produce audiotapes using both studio and field grade reel-to-reel and cassette formats in a variety of situations. Major topics include hardware, microphone selection and use, acoustical considerations, dubbing, editing and multitrack recording techniques. Special emphasis is on mastery of techniques for audiovisual applications.

Credit 4

ICIC-500 **Practicum in a Special**
Registration #0612-500 **Interest Area**
Allows a student to explore or develop a special competence in an area of special interest and to work with "clients" in real or simulated work environments. A proposal (guidelines available from the department) must be submitted prior to registration For audiovisual communications majors only.

Credit variable (1-4)

ICIC-501 **Practicum in Audiovisual**
Registration #0612-501 **Program Design**
Allows a student to explore or develop a special competence in audiovisual program design and to work with “clients" in real or simulated work environments. A proposal (guidelines available from the department) must be submitted prior to registration. For audiovisual communications majors only.

Credit variable (1-4)

ICIC-502 **Practicum in Audiovisual**
Registration #0612-502 **Management**
Allows a student to explore or develop a special competence in audiovisual management and to work with “clients" in real or simulated work environments. A proposal (guidelines available from the department) must be submitted prior to registration. For audio visual communications majors only.

Credit variable (1-4)

ICIC-503 **Practicum in Audiovisual**
Registration #0612-503 **Production**
Allows a student to explore or develop a special competence in advanced production and work with “clients" in real or simulated work environments. A proposal (guidelines available from the department) must be submitted prior to registration. For audiovisual communications majors only.

Credit variable (1-4)

ICIC-510 **Writing for Audiovisual Programs**
Registration #0612-510
Emphasizes the principles of script writing for verbal and visual continuity, clarity and impact. Considers the audience and purpose for which the script is being written, the intended medium, and styles of writing. Required for all students.

Credit 4

ICIC-550 **Management of Audiovisual Programs**
Registration #0612-550
Covers organizational strategies, management practices, budgeting and fiscal control, personnel recruitment, selection, training and supervision, resource center operation and organization.

Credit 4

ICIC-560 **Media Facilities Design**
Registration #0612-560
Examines major variables influencing the design of such media facilities as media production areas, darkrooms, audio and television studios and control rooms, and training and instructional areas. Topics include acoustics, lighting, ventilation, electrical circuits, space requirements and layouts.

Credit 4

ICIC-570 **Survey of Audiovisual Equipment**
Registration #0612-570
Permits the student to both survey the wide spectrum of AV equipment available and to do an in-depth analysis of one type of equpment. Different groups of students will then report to the class the results of their in-depth study, using demonstrations, media presentations, visits by dealers or manufacturers and other methods.

Credit 2

ICIC-580 Producing Multimedia Presentations
Registration #0612-580
Students design, produce and present multimedia and/or multi-image production. Both theory and practical aspects such as programming devices, presentation problems, equipment needs are covered. (Multimedia refers to combination of different techniques from combining different media to multi-image and multi-screen projection.)

Credit 4

ICIC-595, 596 Senior Project
Registration #0612-595, -596
Focus is on the design and production of an interview presentation package based on each senior's own job aspirations, professional skills, personal qualities and portfolio materials. These courses are to be taken in the Fall and Winter quarters of the senior year. Both are required for graduation. For audiovisual communications majors only.

Credit 2/Qtr.

Instructional Technology

ICIT-700 Introduction to Instructional
Registration #0613-700 Technology
A modularized course which surveys various areas in instructional technology; including the definitions of instructional technology, the history, the research, leaders, funding, trends, television, health science applications and community college applications. Each module is worth one-half credit. Each student is required to complete at least two credits for graduation.

Credit 2 or 3

ICIT-703 Training Health Professionals
Registration #0613-703
Examines the various methods used to train physicians, nurses, dentists, and other allied health personnel. Particular emphasis is placed on the role of instructional technology in current training programs. Maximum use is made of field trips to various local training programs.

Credit 2

ICIT-705 Sources of Information in
Registration #0613-705 Instructional Technology
Examines the wealth of information sources available to instructional technologists, including catalogs of nonprint material, handbooks, newsletters, ERIC, hardware and software dealers, conference proceedings and books. Students are given problems to solve requiring use of these sources.

Credit 3

ICIT-706 Sources of Visual Information
Registration #0613-706
Students develop general search techniques and strategies for finding information, evaluating it, and establishing a reference file for development of instructional materials. Specific application of these techniques is made to locating sources of original visual (graphic, photographic, print) material and of prepared visuals in secondary sources. Interpreting and following recent copyright regulations is discussed. Major search paper required.

Credit 3

ICIT-710 Programed Instruction
Registration #0613-710
Students review principles and techniques of preparing programed instruction; then design, produce and validate their own programed instruction materials; includes research and development related to programed instruction and sources of programed materials.

Credit 4

ICIT-712 Computer Assisted Instruction
Registration #0613-712
Students review the use of the computer for instruction (computer-assisted instruction) and then produce their own teaching programs actually using a computer. Examines research about computer assisted instruction, various hardware and software configurations, programming languages and sources of already developed computer-assisted courses, also discusses various methods of course and lesson development. (Prerequisite: ICIT-710 or permission of department.)

Credit **4**

ICIT-715 Instructional Television
Registration #0613-715
Explores the various uses of television as an instructional medium, e.g., individualized instruction, instruction of mass audiences, stand-alone instruction, integrated instruction. Students must produce at least one television program. Surveys the hardware, technology and software of television.

Credit **4**

ICIT-720 Research in Instructional
Registration #0613-720 Technology
Examines the fundamentals of educational research: hypothesis stating, designs, statistical procedures, reporting techniques, and types of research. Specifically examines the research in instruction. Students learn to critique research articles and develop evaluation plans.

Credit **4**

ICIT-722 Research Project
Registration #0613-722
A variable credit course which allows a student to conduct a research project based on the student's interests and with the advice and consent of a faculty member. A formal research proposal must be submitted before registering for this course. Proposal guidelines are available from the department.

Credit **1-4**

ICIT-735 Psychology of Learning and Teaching
Registration #0613-735
Relates various theories of learning to actual teaching and training. Students review learning principles and apply them to practical instructional situations. Emphasis is on behavioral approach to developing instruction and training.

Credit **4**

ICIT-745 Instructional Facility Design
Registration #0613-745
Designed to enable the instructional technologist to assist and participate in the design of spaces and related facilities for effective learning. Specific topics include acoustics, lighting, ventilation, electric circuits, planning for electronic distribution systems, equipment specifications, spatial relationships, together with architectural engineering and contracting procedures.

Credit **4**

ICIT-750 Instructional Development I
Registration #0613-750
Covers the concepts and principles underlying the development of instructional programs and materials. Instructional development is the systematic solution of instruction and learning problems involving needs assessment, task analysis, specification of objectives, analysis and synthesis of instructional strategies, and methods of evaluation. A limited instructional development project is part of the course. Required for graduation. (Note: ICIT-700 must be taken before or simultaneously with ICIT-750.)

Credit **4**

ICIT-751 Instructional Development II
Registration #0613-751
A continuation of Instructional Development I (ICIT-750) in which instructional development principles are applied in an actual project selected by the student. More sophisticated means of development, evaluation, and revision are included along with strategies for media selection and development. Literature of the field is also covered. Required for graduation. (Prerequisite: ICIT-750)

Credit 4

ICIT-752 **Instructional Development III**
Registration #0613-752
Stresses the difference between personnel/faculty development, instructional/program development, and curriculum/organizational development and how the instructional developer or trainer becomes an agent for change. Examines the methods of disseminating and promoting the adoption of innovative methods and materials. Students research special problems related to selected areas of instructional development. (Prerequisite: ICIT-750 & 751)

Credit 4

ICIT-757 **Techniques of Work Analysis**
Registration #0613-757
Students learn a variety of job analysis and task analysis techniques based on Functional Job Analysis. Data gathered from analyses is cast into various formats for job restructuring, writing job descriptions, establishing task and job hierarchies, and developing training programs. Students learn to develop job inventories and checklists for gathering task information for a number of interrelated purposes.

Credit 2

ICIT-762 **Management & Budgeting in**
Registration #0613-762 **Instructional Technology**
Applies basic theories of management to areas of instructional technology (such as production, audiovisual services) and to management of personnel of those areas. Examines the organizational structure of media centers and units within the center. Covers budgeting and actual financing for media center services and projects dealing with the use of media in training and instruction.

Credit 4

ICIT-765 **Individual Learning Style Analysis**
Registration #0613-765
Examines the ways different individuals learn and relates instructional strategies to learning styles. Covers cognitive style mapping, aptitude treatment interaction, application of norm and criterion referenced tests as they relate to individual learning styles. (Prerequisite: ICIT-735)

Credit 4

ICIT-770 **Interpersonal Communications**
Registration #0613-770
Instructional development requires that instructional technologists be able to work well with people. Participants in the course are taught to be sensitive to others as well as to examine their own feelings in a group situation. Required for graduation.

Credit 2

fCIT-780 **Selected Topics in Instructional**
Registration #0613-780 **Technology**
This seminar provides a forum for a small group of students to examine various areas of interest to them. Students select topics, examine them thoroughly, and present the findings for group consideration. Required for graduation.

Credit 2

ICIT-840 **Internship**
Registration #0613-840
Special opportunities may occur for students to obtain work experience in a job or environment similar or coincident with their career objectives In fact, students are encouraged to locate such opportunities. This course recognizes this experience. A proposal, guidelines available from the department, must be submitted prior to registering for this course.

Credit 1-4

ICIT-8&0 **Independent Study**
Registration #0613-850
An opportunity for a student to explore, with a faculty advisor, an area of interest to the student. A proposal, guidelines available from the department, must be submitted prior to registering for this course

Credit 1-4

Packaging Science

IPKG-201 **Principles of Packaging**
Registration #0607-201
An overview of packaging: 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 will be presented, along with information about economic importance, social implications, and packaging as a profession.

Class 4, Credit 4

IPKG-310 **Methods of Evaluation**
Registration #0607-310
Information about recognized standard testing procedures will be presented, and students will gain practical experience in the operation of various commonly used testing instruments which are used to determine physical properties of fibre, metal, plastic, and glass packaging materials. (IPKG-201)

Lab 4, Credit 2

IPKG-311 **Packaging Materials I**
Registration #0607-311
The manufacture, physical and chemical properties, and uses of commonly used packaging materials, components, and primary packages for consumer and institutional use, will be presented. Emphasis is on metals and plastics used in packaging, and adhesives, propellants, and other component materials. (IPKG-201)

Class 3, Credit 3

IPKG-312 **Packaging Materials II**
Registration #0607-312
The manufacture, physical and chemical properties, and uses of commonly used packaging materials, components, and primary packages for consumer and institutional use will be presented. Emphasis is on paper, paperboard, wood, and glass used in packaging applications. (IPKG-201)

Class 3, Credit 3

IPKG-431 **Packaging Production Systems**
Registration #0607-431
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. The characteristics of such equipment, and maintenance programs will be considered. Students will gain practice in setting up complete production lines for packaging various products. (IPKG-311, 312)

Class 2, Lab. 4, Credit 4

IPKG-432 **Packaging for Distribution**
Registration #0607-432
An exploration of different shipping, storage, and use environments common to various products and packages. Structural design of packages for product physical protection, chemical compatibility as a factor in shelf life, and methods for testing and predicting these factors will be studied. (IPKG-311, 312)

Class 2, Lab. 4, Credit 4

IPKG-433 **Packaging for Marketing**
Registration #0607-433
The interrelationship between packaging and marketing, detailing how the retail consumer package can be used as a scientific 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 upon packaging will be considered. Students will gain practice in the development of a complete package system. (IPKG-431, 432)

Class 2, Lab. 4, Credit 4

IPKG-520 Packaging Management
Registration #0607-520
A study of packaging organization in the contemporary corporation and project management techniques available to the packaging manager. Organization theory will be discussed, and compared with typical industry practice. Other topics will include PERT, value analysis, and the impact of regulatory agencies upon packaging from a management standpoint. (This course is intended for seniors)

Class 3, Recitation 1, Credit 4

IPKG-524 Packaging Economics
Registration #0607-524
A study of the costs involved in the development, manufacture, and distribution of packages, in order to develop a working knowledge of packaging costs. Cost elements associated with development, tooling, materials, machinery, processing, and distribution will be discussed. The usefulness and validity of various value theories will be considered. (This course is intended for seniors)

Class 3, Credit 3

IPKG-530 Packaging and the Environment
Registration #0607-530
Consideration of packaging in a social context. Factors which enhance secondary use, recycling, recovery of resources, and proper disposal will be discussed. Package design in relation to solid waste disposal and materials and energy shortages will be considered. Other topics of current, social interest will be discussed. Primarily a discussion class for senior students. Open to non-majors. (This course is intended for seniors)

Class 1, Rec. 1, Lab. 2, Credit 4

IPKG-590 Senior Thesis
Registration #0607-590
An in-depth study of some phase of packaging which will enable the student to make use of the knowledge and skills acquired during the course of the program.

Arranged, Credit 4

IPKG-599 Independent Study
Registration #0607-599
Independent study, in consultation with the instructor, on any packaging-related topic.

Arranged, Credit variable

Reserve Officers' Training Corps

First Year

MMSM-201 The Military and American Society I
Registration #0701-201
Introduction to the organization of the United States Army and the ROTC program; warfare: its nature, origin, conduct and future; voluntary leadership laboratory.

Class 1, Credit 1

MMSM-202 The National Security Structure
Registration #0701-202
U.S. Army and National Security Organization of the federal government with emphasis on the Congress, Executive Office of the President, and the Department of Defense. Public opinion and national security; an introduction to small unit organization and military rank; voluntary leadership laboratory.

Class 1, Credit 1

MMSM-203 The Military and American Society II
Registration #0701-203
The impact of the military upon American political, economic and social institutions; significance of military customs, courtesies and traditions; introduction to U.S. Army weapons; voluntary leadership laboratory.

Class 1, Credit 1

Second Year

MMSM-301 Introduction to Basic Operations and Tactics
Registration #0701-301
Provides a knowledge of small unit leadership with emphasis on map reading and land navigation; leadership laboratory.

Class 2, Credit 2

MMSM-304 Basic Operations and Tactics
Registration #0701-304
Fundamentals and techniques of squad level tactics with emphasis on leadership, command and control, and tactical employment; leadership laboratory.

Class 2, Credit 2

MMSM-305 Junior Officer Development
Registration #0701-305
The functions, duties and responsibilities of a junior officer with an introduction to career planning; leadership laboratory to include field training exercise and military installation orientation visit.

Class 2, Credit 2

Third Year

MMSM-401 Fundamentals of Instruction
Registration #0701-401
Examination of principles and techniques that are utilized in the preparation and presentation of a complete period of instruction; leadership laboratory.

Class 3, Credit 3

MMSM-402 Leadership in Small-Unit Operations
Registration #0701-402
An extended course in leadership and management of resources on the tactical battlefield with heavy emphasis placed on sequential timing and economy of forces and resources; leadership laboratory to include field training exercise and military installation orientation visit.

Class 3, Credit 3

MMSM-403 Leadership and Management
Registration #0701-403
Provides future officers with the basic principles of leadership and management of human resources; motivation, morale, communication, individual and group behavior are discussed; leadership laboratory.

Class 3, Credit 3

Fourth Year

MMSM-503 World Change and Military Implications
Registration #0701-503
A study of the Army's contribution to the total military structure; an introduction to military implications in the international system readings in military history; leadership laboratory to include field training exercise and military installation orientation trip.

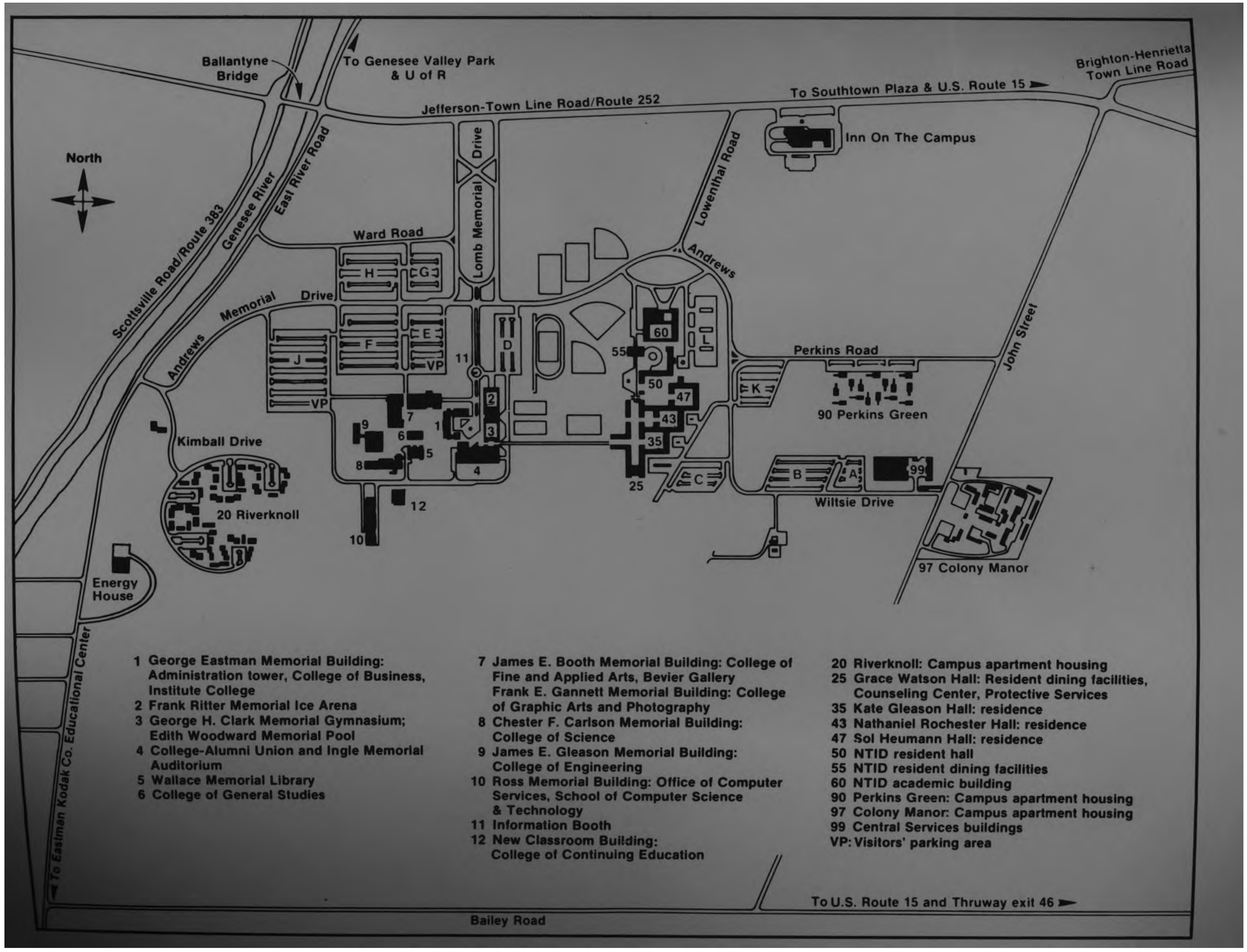
Class 3, Credit 3

MMSM-504 Administration and Staff Operations
Registration #0701-504
Staff organization, functions and responsibilities at battalion level and company administration; readings in military history, leadership laboratory.

Class 3, Credit 3

MMSM-505 Advanced Leadership and Management
Registration #0701-505
Further studies in leadership and management with emphasis on contemporary human problems and military justice; readings in military history; leadership laboratory.

Class 3, Credit 3


Ballantyne Bridge
To Genesee Valley Park & U of R
Brighton-Henrietta Town Line Road
To Southtown Plaza & U.S. Route 15
Jefferson-Town Line Road/Route 252
Inn On The Campus
North
Scottsville Road/Route 383
Genesee River
East River Road
Drive
Lomb Memorial
Lowenthal Road
Ward Road
Andrews
Memorial
Drive
Andrews
Perkins Road
John Street
90 Perkins Green
Kimball Drive
20 Riverknoll
Wiltsie Drive
97 Colony Manor
Energy House
To Eastman Kodak Co. Educational Center
To U.S. Route 15 and Thruway exit 46
Bailey Road
1 George Eastman Memorial Building: Administration tower, College of Business, Institute College
2 Frank Ritter Memorial Ice Arena
3 George H. Clark Memorial Gymnasium; Edith Woodward Memorial Pool
4 College-Alumni Union and Ingle Memorial Auditorium
5 Wallace Memorial Library
6 College of General Studies
7 James E. Booth Memorial Building: College of Fine and Applied Arts, Bevier Gallery
Frank E. Gannett Memorial Building: College of Graphic Arts and Photography
8 Chester F. Carlson Memorial Building: College of Science
9 James E. Gleason Memorial Building: College of Engineering
10 Ross Memorial Building: Office of Computer Services, School of Computer Science & Technology
11 Information Booth
12 New Classroom Building: College of Continuing Education
20 Riverknoll: Campus apartment housing
25 Grace Watson Hall: Resident dining facilities, Counseling Center, Protective Services
35 Kate Gleason Hall: residence
43 Nathaniel Rochester Hall: residence
47 Sol Heumann Hall: residence
50 NTID resident hall
55 NTID resident dining facilities
60 NTID academic building
90 Perkins Green: Campus apartment housing
97 Colony Manor: Campus apartment housing
99 Central Services buildings
VP: Visitors' parking area