

**Rochester Institute
of Technology**

Official Bulletin



Undergraduate Programs 1974/75

May 1974

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ROCHESTER INSTITUTE OF TECHNOLOGY

1974-75 Institute Calendar

FALL QUARTER (1974)

Sept. 16, 17: CCE REGISTRATION
 Sept. 19-22: Orientation for New Students
 Sept. 23: New Student Registration
 Sept. 23, 24: Graduate Registration
 Sept. 24: Returning Upperclass Registration

Sept. 25: Special Student Registration (Day)
 Sept. 25: Classes Begin Day & CCE
 Nov. 27-Dec. 1: Thanksgiving Vacation
 Dec. 14: Last Day of Quarter
 Dec. 15-Jan. 5: Quarter Vacation

Note: Career Seminars in all fields, Oct. 26

WINTER QUARTER (1975)

Dec. 17, 18: CCE REGISTRATION
 Jan. 6: First Day of Class (CCE)
 Jan. 6: DAY COLLEGE REGISTRATION
 (undergraduate & graduate)
 Jan. 7: Special Student Registration (Day)

Jan. 7: First Day of Classes (Day)
 Feb. 14: Special Activities Day
 Mar. 19: Last Day of Quarter
 Mar. 20-Mar. 23: Quarter Vacation

SPRING QUARTER (1975)

Mar. 18, 19: CCE REGISTRATION
 Mar. 24: DAY COLLEGE REGISTRATION
 (undergraduate & graduate)
 Mar. 24: First Day of Class (CCE)
 Mar. 25: Special Student Registration (Day)
 Mar. 25: First Day of Classes (Day)

Mar. 28, 29: Institute Closed
 May 26: Institute Closed Memorial Day
 June 6: Last Day of Quarter (Day)
 June 7: Last Day of Quarter (CCE)
 June 7: Commencement

The Symbolism of the Identity Mark — The Identity Mark is the central element in a total graphics system identifying Rochester Institute of Technology. It was designed in the hold, twentieth-century tradition to afford ease of recognition and visibility at a distance.

Based on the striking architecture of the Henrietta campus, it is intended to reflect the progressiveness, confidence, and academic orientation of the Institute symbolically, rather than by reference to a specific, literal form on campus.



Photographs in this catalog are from the Staff Photographer's Office:
John Massey, director; Lynn Johnson, J. Brian King, John McCurley.

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CAMPUS MAP..... Inside Back Cover

Students tell us what it's like



WHAT DO INCOMING STUDENTS EXPECT?

Rochester Institute of Technology really believes that education is for students. It wants to know what students expect ... it listens to their responses.

Once again, in the fall of 1973, all incoming students—freshmen and transfers—were asked to fill out a questionnaire telling us what we need and want to know about them; their hopes and their expectations. We'd like to share some of their ideas with you.

I would prefer the kind of education which:

- ...allows specialization in my chosen field (91%)
- ...allows flexibility in developing individualized academic programs (82%)
- ...allows an early sampling of technical and professional courses in the first year (77%)
- ...allows an early sampling of technical and professional courses in the first year (77%)
- ...allows me to take courses of interest to me, whether or not they prepare me for an occupation when I graduate (62%)

Reasons considered important in selecting RIT:

- ...it has a good academic reputation (71%)
- ...it offers specialized education programs (62%)
- ...it follows cooperative education plan (Varies with RIT programs, therefore overall percentage not applicable)

These objectives were considered very important:

- ...A college degree is necessary for the kind of work I want to do (75%)
- ...I want to learn about certain ideas which only college can satisfy (71%)
- ...In college I will acquire learning skills which I can use after graduation (77%)

What are their career goals?

Three requirements were listed as of primary importance in an occupation:

- The opportunity to use special abilities and talents;
- The prospect of an above-average income;
- The freedom to be creative and original.

It is not strange, in the uncertainties of the present, that there is less definiteness about one's occupational choice. RIT is aware of this. Historically the purpose of this Institute has been to offer an education directed toward professional and technical preparedness. It now seeks to combine this primary aim with greater flexibility in reaching that goal—options that appeal to individual interests and talents.

The opinions and attitudes of students who are with us, or will soon come to us, are very important at RIT; that is why they introduce this catalog.

Alumni give us their observations

Rochester Institute of Technology graduates live and work in all fifty states and several foreign countries. Many have become leaders in their chosen professions . . . perhaps you know some of them. But we thought you might be even more interested in what young men and women who have just graduated in the last four or five years—when many young people questioned the value of college—have to say about their RIT experience. These are typical replies to a questionnaire sent out by the RIT Alumni Association.

David Hurd, 117 Clinton Place, Utica, NY 13501

'70 Retailing. FM radio station announcer, engineer, program director.

"RIT is more concerned with the business of education and goes about it in a businesslike way. It's more of a brain factory than a collegiate country club."

Mark J. Schell, 803 Hansen, Idaho Falls, ID 83401

'72 Mechanical Engineering. Engineer for a nuclear research and development organization.

"RIT is large enough to offer all the things of a larger school but you don't get lost in the crowd. There is easy access to teachers."

Miss Heather Thornton, RR#1, Box 87, Leonard Place, Delmar, NY 12054

'70 Photography (Illus). Director of advertising and publicity for an insurance company.

"RIT is more for the mature individual who wants an education in a specific area, rather than the rah-rah college scene."

Jorge Alberto Perez, Calle 30 Norte #2bis 94, Cali Colombia, S. America

'69 Printing. Technical Training manager. Training of personnel in the technical aspects of the graphic arts.

"Helped very much in acquiring the technical skills and information that I am now trying to impart to all levels of our organization (over 4,000 employees)."

Ronald Gaudelli, 30 Mariposa Drive, Rochester, NY 14624

'70 Chemistry. Development chemist.

"RIT is a very undergraduate-oriented institution. It is interested in the student."

S. D. Meltzer, 98C, 315 Springfield Road, DeWitt, NY 13214

'71 Retailing. Field representative for Xerox college publishing.

"At RIT, I developed discipline to do that which has to be done. If you can do it at school, you can do it at work. Responsibility is the key."

Donald S. Milton, 2414 Browncroft Blvd., Rochester, NY 14624

'70 Business Management. Business analyst.

"One of the key things is that because RIT's courses and instructors offer a more practical approach to the real world, I felt at ease upon entering my field."



Kenneth W. Lehmann, Johnston Road, RD#1, New Wilmington, PA 16142

'70 Printing. General manager.

"Every piece of equipment that we are using right now in the printing plant was studied and carefully looked at while attending RIT."

James Jay Neuscheler, 79-A Lyellwood Pkwy., Rochester, NY 14606

'71 Business. Customer service account administrator.

"By alternating classroom subjects and actual work experience, I could put to use what I had to learn before it got pushed back into a dark corner of my brain."

Mrs. Marilyn Rubright, 643-1 Stowell Drive, Rochester, NY 14616

'72 Med. Tech. Staff medical technologist (hematology) at a hospital.

"My RIT education gave me the background necessary to comprehend some of the laboratory tests I perform. For example, there is quite a bit of chemistry behind most lab tests and without the background of analytical chemistry and bio-chemistry I could not fully understand them."

Mrs. Sharon B. Deyo, 23 Denton Road, Binghamton, NY 13903

'71 Dietetics. Registered dietitian, therapeutic. Dietitian in 400 bed hospital. Consultant dietitian - 40 bed rural hospital.

"The Co-op especially helped me in the field of dietetics. I had practical work and supervisory experience before entering the dietetic internship."

Paul L. Comstock, 81 Smith Street, Brockport, NY 14420

'71 Marketing. Financial planning adviser for an insurance agency.

"College lasts for 4 years, your career for 40. Preparing for your future at RIT provides you with a real headstart when you seek employment. More important, it will provide you with the type of education that will allow you to think for yourself and advance rather than reach a plateau early."

Norman Schoenberger, Jr., 210 Brandon Road, Baltimore, MD 21212
'69 Graphic Arts-Printing. Sales representative: Packaging Corporation of America.

"Professional acceptance by my co-workers, superiors and customers; a valuable asset for a successful business life."

Michael D. Fetcie, 1115 Summit Place, Apt. 3, Utica, NY 13501
'71 Electrical Engineering. Electronics engineer.

"Through Co-op, I was exposed to levels of engineering and electronics not readily available to students in a standard four-year program."

Mrs. Karen J. Maher, 1071 Kirts Road, Troy, NY 12180
'71 Retailing. Area sales manager, Misses Moderate Sportswear.

"RIT is small enough that you know the other students you pass on your way to class and can exchange hellos. People are friendly and open, not snobbish, because there is no real class distinction."

Jeff Barlowe, 55 Wilson Lane, Bethpage, NY 11714
'70 Photography. Acting assistant director, public relations, State University at Farmingdale.

"What is rare elsewhere but in abundance at RIT is a professional no-nonsense atmosphere which instills a respect in the student for his area of study."

Gary Hipp, 218 Union Street, Schenectady, NY 12308
'71 Business Administration. Food service manager. Responsible for feeding 600 students at Union College. Purchasing, accounting, staff relations, student relations.

"In my position I see quite a few colleges and talk with many administrators. RIT seems to be in front as far as getting down to your major right away. The Co-op program is excellent in providing some kind of job experience."

Carl F. Loomis, B3-3 New Slocum Hts., Syracuse, NY 13210
'72 Printing. Teaching assistant-graphic arts lab, Syracuse University, Journalism School (Newhouse Communications Center).

"My experiences both with other colleges which offer programs in Graphic Arts, and with the graduates of these programs, have convinced me that there is no place else which even begins to compare to RIT. If you have a serious desire to work in these areas, then you can do no better. However, if all you want is four years away from home, I recommend a cheap hotel."

Data Capsule — RIT

Location:	In the town of Henrietta, New York, integral part of the Rochester metropolitan area of about 700,000 people.
Type:	Private, coeducational, non-sectarian, with approximately 40% transferring in as upperclassmen.
Orientation:	Science, Technology, the Fine and Graphic Arts, Management, selected Social Professions, with strong emphasis on professional competency.
Size: Fall '72 Enrollment:	Day Colleges enrollment—6015. *Part-time, (Continuing Education, Summer Session, Extended Services)—6268 <i>*In addition, 4,022 new students were enrolled in the 1972-73 academic year.</i>
Degrees:	A.A., A.S., A.A.S., B.F.A., B.S., B. Tech., M.B.A., M.E., M.F.A., M.S., M.S.T.
Programs: Co-op Calendar	Colleges of Business, Engineering, and Science; School of Applied Science; School of Printing (optional); College of General Studies (Social Work and Criminal Justice); Computer Science and Technology.
Usual Calendar	College of Fine and Applied Arts; School of Photographic Arts and Sciences; Department of Packaging.
Facilities:	All-new \$65 million campus, occupied in 1968, with additional buildings for the National Technical Institute for the Deaf.
Housing:	Residence Halls for single students, with on-campus apartments and townhouses for married students.
Sports:	Full intercollegiate sports schedule, as well as intramural and recreational programs.
Other Cocurricular Activities:	Fraternalities, sororities, professional and honorary societies, special interest clubs, service organizations.
Alumni:	27,000 in all 50 states and worldwide.



ACADEMIC
PROGRAMS
(UNDERGRADUATE)

Undergraduate programs are pursued through the following curricula:

College of Business – Accounting, Business Administration, Consumer Services Administration, Food and Tourist Industries Administration, Hospital Dietetics, Retail Management, Photographic Marketing Management;

College of Continuing Education – Variety of programs, primarily for part-time students, leading to diploma or degrees. (For information, see separate Continuing Education Catalog);

College of Engineering – Electrical, Industrial, and Mechanical Engineering;

College of Fine and Applied Arts – Communication Design, Fine Arts, Industrial/ Environmental Design, Ceramics, Glassblowing, Metalcrafts and Jewelry, Textiles and Weaving, Woodworking and Furniture Design;

College of General Studies – Bachelor's degree programs in Social Work and in Criminal Justice, while continuing to offer a range of courses in the Humanities (Liberal Arts) for all students in the other Colleges;

College of Graphic Arts and Photography – Printing Management, Printing Technology, Professional Photography, Photographic Illustration, Photographic Science and Instrumentation, Biomedical Photography, Biomedical Communications, Photographic Processing and Finishing Management;

College of Science – Biology, Medical Technology, Chemistry, Chemical Technology, Mathematics, Nuclear Medicine Technology, Physics;

Institute College – Computer Science and Technology, Packaging Science (Design, Management, Technology), Upper-Level Transfer Programs in Applied Science (Civil, Electrical and Mechanical Engineering Technology);

Career Decision – Administered by the Counseling Center for career exploration over one to three quarters;

National Technical Institute for the Deaf— Certificate, Diploma and Associate degrees are offered through Technical Education Programs. Deaf students who qualify also may enter any other college within RIT with full support services, adapted as appropriate to the needs of these students.

Graduate programs through the Master's Degree are offered in these areas:

College of Business – Master of Business Administration, Master of Science in Accountancy;

College of Continuing Education – Master of Science in Applied and Mathematical Statistics;

College of Engineering – Master of Science in Electrical or Mechanical Engineering, Master of Engineering as a new professional study-internship graduate program;

College of Fine and Applied Arts – Master of Fine Arts, Master of Science in Teaching (Art Education);

College of Graphic Arts and Photography – Master of Fine Arts in Photography, Master of Science in Photographic Science and Instrumentation, Master of Science in Printing (Technology or Printing Education);

College of Science – Master of Science in Chemistry;

Center for Community College Faculty Development – Master of Science in Business Technology or Engineering Technology, Master of Science (External), Master of Science in Instructional Technologies.

ACADEMIC
PROGRAMS
(GRADUATE)

Rochester Institute of Technology is chartered by the Regents of the University of the State of New York and registered by the State Education Department. It is accredited by the Middle States Association of Colleges and Secondary Schools. It is a member of the American Council on Education and the Association of Colleges and Universities of the State of New York.

The Electrical Engineering and Mechanical Engineering curricula are accredited by the Engineers' Council for Professional Development. The Public Accounting curriculum, School of Business Administration, is registered with the New York State Education Department and graduates meet requirements for candidacy for the Certified Public Accountant examination. Food Administration graduates who earn the B.S. Degree with major in Dietetics are qualified to apply for American Dietetics Association internships. The curriculum in Medical Technology fulfills the requirements for taking the registry examination of the American Society of Clinical Pathologists for medical technologists. The five-year program in Chemistry, leading to the B.S. Degree, has been approved by the Committee on Professional Training of the American Chemical Society. The programs in the College of Fine and Applied Arts have been accorded accreditation by the National Association of Schools of Art.

ACCREDITATION

Orientation of RIT

Rochester Institute of Technology is a complex of colleges with the purpose to prepare men and women for adult living in our democratic and technological society. RIT is concerned not only with its professional studies as ends in themselves, but also with the social implications of technology.

Living as we do in the midst of the most highly advanced technological environment, it is recognized that scientific, technological and humanistic knowledge will continue to expand at an accelerating rate. Curricula must be designed, and programs added, that are pertinent to the times—that will prepare our graduates to adapt to change and to work for the betterment of succeeding generations.

THE GROWTH OF AN IDEA

RIT has a history. It dates back to 1829, when the brash frontier village decided that — in addition to the material wealth brought about by its productive farms, its mills at the falls of the Genesee, and the Erie Canal — there was more to life than just making a living. The need was for the infusion of some elements of culture in an occupation-centered existence. The Rochester Athenaeum was founded; its philosophy is an important part of RIT today.

As Rochester became a leader in high-skill industry shortly after the Civil War, the new need was for expertly trained technicians and supervisors. The void was filled by establishing Mechanics Institute, where young men discovered the satisfaction and the rewards that come to those whose training is in demand. The Athenaeum and the Institute merged in 1891; graduates were equipped for "the making of a living and the living of a life." This is still true.

A third dimension has come about more recently, but rests upon the other two. In addition to awareness of the cultural heritage, and proficiency in an occupation, there must be a perception of the new directions society should follow if it is to survive. This requires education for the role of leadership in a world that urgently needs men and women trained in a career, able to interact with changing conditions, and willing to assume responsibility as an *inheritor* as well as an *innovator*.

This is where Rochester Institute of Technology stands today.

CAREER OBJECTIVES

Rochester Institute of Technology has always had a strong orientation toward a career. Its graduates, for the most part, move directly into professional or technological occupations because their education has made them ready for such positions. This points up one of the differences to be found at RIT.

Most students who enroll at the Institute have an interest in a particular profession or career. They select RIT because it provides the opportunity to specialize in that field, but at the same time have a broadened collegiate experience through the offerings of a strong College of General Studies that are an integral part of every curriculum.

When applying for admission to RIT, one seeks to register in a degree program of *one* of the individual colleges. However, there is opportunity for electing courses in other colleges as they meet personal goal objectives, and some programs are purposely designed for inter-disciplinary experience. In general, serious thought about a career is assumed. Education is thus more direct, and graduates are eagerly sought for their professional competence.

There will be Career Seminars in all fields on October 26.

This in part accounts for the significant increase in Transfer Students . . . applicants who have completed an associate degree at a two-year college, and others who now find themselves in a better position to make a career decision in one of the areas of specialization offered at RIT. With about 40 percent of entering students transferring at the second or third year level, RIT has considerable experience in helping these students make a smooth transition.

While students transfer into all RIT colleges and programs, the unique offerings of the upper-level School of Applied Science are of especial interest to graduates of two-year colleges, since these programs have been explicitly designed to build upon the established two-year curricula.

The Office of Community/Junior College Articulation has been established in order to better serve students transferring from two-year colleges.

This Office has been organized to initiate new areas of two-year college/RIT cooperation, and to serve as a focal point for communications involved with the increased number of students transferring to RIT from two-year colleges. It promotes mutual understanding of curricula, provides information on student characteristics and chances of success, plans visits in both directions that will be mutually helpful.

A program, now in its fourth year, recognizes that not every high school graduate is ready to decide upon a career. It combines exploration of career fields within the RIT curricula, and individual counseling and guidance. This Career Decision option is described in a later section of this catalog.

RIT was a pioneer in establishing the cooperative plan of education in 1912. This experience, with its several benefits, has been of significant importance in attracting students to RIT.

As followed in the College of Engineering (Electrical, Industrial, or Mechanical Engineering); the College of Business (Business Administration, Food Services Administration, or Retailing); the College of Science (Biology, Chemistry, Mathematics or Physics) students spend their first two years in full-time study. As they enter their third year, they spend alternate quarters in full-time study and full-time work in an occupation that will further their career goals. (Bachelor degree programs in the Colleges of Engineering and Science take five years to complete, while those in the College of Business are four-year cooperative programs.)

APPEAL TO
TRANSFER STUDENTS

COMMUNITY
JUNIOR COLLEGE
ARTICULATION

CAREER
DECISION
PROGRAMS

COOPERATIVE
EDUCATION
PROGRAMS

In addition, the upper-level School of Applied Science (Engineering Technology) in Institute College follows the same cooperative plan as the College of Engineering, for its students who enter with the Associate's degree. This takes three years to complete.

Students in Medical Technology have three years full-time at RIT, and then one year of full-time internship in a cooperating hospital.

The Department of Computer Science and Technology of Institute College offers a five-year B. Tech cooperative program for those entering as freshmen, with the first two years in full-time study. Transfers with an Associate degree in data processing, programming, or equivalent enter as third-year students. All follow the alternate work-study co-op programs for the third, fourth and fifth years.

The Chemical Technology program is a three-year program leading to an A.A.S. degree. After spending the first quarter in full-time academic study, students alternate quarters of attending classes and working in industrial organizations.

The College of General Studies, in its program in Social Work and in Criminal Justice, uses field experience assignments in much the same way as the cooperative plans just described.

The School of Printing offers the cooperative plan as an option to its students, which extends the time required for a degree.

In all of these, the work blocks – supervised by the Institute – provide important educational experience that gives practical meaning to the students' academic studies. Of course, earnings also help considerably in meeting college expenses. At graduation this integration of on-campus education and on-the-job experience is often the difference between starting permanent employment as a beginning trainee, or being accepted for a higher level position.



The RIT Environment

The Greater Rochester area, city and immediate suburbs, has a population of about 700,000. Rochester, widely known for its leadership in technology and science, is an ideal location for Rochester Institute of Technology.

THE COMMUNITY

An international photographic center and the largest producer of optical goods in the United States, Rochester manufactures electronic and communications systems, fine machine tools, signaling devices, dental equipment, and a variety of precision instruments. It is a food processing center, and its printing and lithographic houses are widely noted for quality work. These local industries, along with others throughout the nation, have contributed to the Institute's financial support; many have maintained cooperative employment; and all have provided a congenial and sympathetic community atmosphere for RIT.

Rochester is a noted cultural center where support of music, art, theater, libraries, and museums is a matter of civic pride. For students of the Institute, this cultural environment is an appreciable advantage.

RIT as an institution is very much involved with the community of which it is a part. So are many of its students and faculty. They use the appropriate people in business, government, and community action groups as resources to strengthen this involvement; they learn about the problems of the city and contribute ideas and talents to the solution of them. Some recent examples of class projects include: an exhibit interpreting plans for future transportation systems serving greater Rochester; a multi-media presentation aimed at developing public support for revitalizing the downtown business district.

The Institute occupies a spacious campus about five miles from downtown Rochester. Constructed at a cost of over \$65 million, it was occupied during the 1968-69 academic year. Some 400 acres of the 1,300-acre site are fully developed at present; two principal groupings include the academic complex as now built and the residential center including two groups of apartments for married students. Extensive playing fields and recreational facilities combine with spacious lawns, open fields and woods. . . no feeling of being crowded in . . .and plenty of room to expand as desired.

THE CAMPUS

The campus as presently developed has an Academic-Administration complex of 12 buildings arranged as three adjacent quadrangles. The Residential complex of 16 inter-connected buildings is reached by a quarter-mile mall past the tennis courts and playing fields.

Opening this summer is the \$25 million academic, administrative, and residential center of the National Technical Institute for the Deaf, funded through the U.S. Department of Health, Education and Welfare. RIT is the sponsoring institution of NTID.

Naturally RIT is proud of its beautiful and spacious campus as a place to live, to learn, to enjoy. It is even more gratifying to know that this judgement is impartially shared. Recently the American Institute of Architects awarded the Collaborative Achievement Medal—one of its most distinguished awards—for the overall design of this campus.

THE METROPOLITAN
CENTER

By far the greatest number of RIT offerings away from the main campus are to be found in the Institute's Metropolitan Center, at 50 West Main Street.

Here in the heart of downtown, the Evening Session of the College of Continuing Education provides day and evening course work in areas as diverse as tool making and mathematics, ceramics and management, textile weaving and design, human behavior, social work and electromechanical technology (in this last instance, an entire Associate degree program is available).

During the 1973-74 academic year, more than 1,200 students pursued their educational, vocational, and avocational objectives at the Metropolitan Center. RIT's entire graduate painting program (M.F. A.) is located on the sixth floor, and students from the Institute College come down several days each week to do laboratory work in the excellent electromechanical facilities.

Beyond these curricular uses of the Metropolitan Center, an abundance of technical and community service programs is provided by the Extended Services Division of the College of Continuing Education, and its Urban Extension Office. (For further information, write for the Extended Services Bulletin).

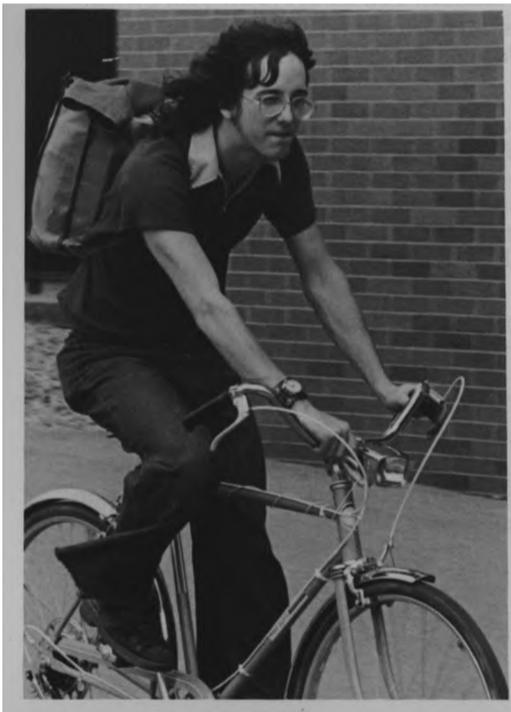
A unique component of the Metropolitan Center is the Distillation Research Laboratory, which has been supported by the Department of the Interior for 13 years to examine unusual physical properties of water and other liquids. The findings are applicable to desalination and recycling of polluted water. For further information write or call its director, Dr. K.C.D. Hickman, 262-2720.

The Metropolitan Center, located within Rochester's Inner Loop and on nine major bus routes, is an easily accessible, largely self-contained facility. It enjoys regular RIT security and physical plant services and a canteen service. In addition to housing numerous Evening Session offerings, the Metropolitan Center is in a unique position to provide courses and programs of special interest to its neighbors—the several wards comprising the central city, City Hall and the County Office Building, and the Center for Governmental Research, a myriad of stores, businesses and industries within a twenty-block radius, and the former Nathaniel Rochester Hall, the City's newest major project providing housing for senior citizens.

The Center's effectiveness is further enhanced by its utilization for special meetings, conferences, seminars of a technical or professional nature, workshops and community involvement programs.

In addition to its use by the College of Continuing Education for these various community service projects, the Metropolitan Center serves as a "home" for Project Upward Bound, Junior Achievement of Rochester, Rochester Regional Research Library Council, Rochester Area Colleges, Recycling Information Office, the Urban League of Rochester and the School Without Walls of the City School District. Finally the Metropolitan Center houses a small but prestigious research facility, the Center for Communications Research, whose primary objective is to apply technology to the communications problems of the deaf and blind.

If you wish additional information about the programs or facilities of the Metropolitan Center, please call or write its Academic Administrator, 50 West Main Street, Rochester, New York 14614. (Telephone: 262-2701).



Life at RIT

College life revolves around classes. But more than that, college life is how the people on campus combine in the various activities available to them. You'll be meeting other students in classes, in dormitories, in social activities, and in extracurricular activities. The unique environment at RIT is produced by our unique student body and by the programs and facilities aimed at your talents and needs.

THE RIT STUDENT

There is no *typical* RIT student. Some have just graduated from high school, and some are beginning or re-entering college later; most programs have a mixture of men and women; there are artists and business majors, those interested in social work and in printing or science. They come from widely different geographical, economic, and cultural backgrounds. A considerable number are deaf. Minority groups are represented in small but increasing numbers. The students here make a diverse group.

COMMON PURPOSE

The latest survey of incoming freshmen and transfers again shows that despite their diversity most RIT students have one thing in common: they want an education oriented toward a professional/technical career. This is what RIT is all about . . . and has been doing from the beginning. Long before the word *Career* suddenly became the "in" expression, RIT stood squarely behind the idea that education for work—for a job—was worthwhile and sound. And over the years it built up a lot of experience in moving graduates directly into a career.

ONE AMONG MANY

It is easy to find a common peer group; yet the diversity and career orientation of the students here make it impossible to feel lost. You always know your own individuality, how you differ from others. Many of the programs, aimed at these different groups, assume the value of both belonging, and at the same time knowing that you're unique.

TRANSFER STUDENTS

About 40 percent of all full-time students attending RIT transferred from another two-year or four-year college. RIT doesn't simply absorb them and ignore their previous experience. We think it's valuable. So in order to continue building on its excellent relationship with two-year colleges, RIT has established the Center for Community/Junior College Relations. This is an excellent two-way channel for cooperative action.

DEAF STUDENTS

The 500 or more students registered through the National Technical Institute for the Deaf (See also page 162) make a distinct contribution to the educational processes of the Institute. They are RIT students in every sense: they come from many varied backgrounds, they are registered in a wide variety of academic fields, and fully share in the extracurricular and social life. Deaf and hearing students often share the same dormitories, and sometimes the same room. They play on the same teams, attend many of the same classes. And hearing students also par-

ticipate in programs for deaf students by interpreting, tutoring, and taking class notes for them. RIT is proud of its share in this national educational effort for deaf people.

RIT has always had a large number of commuting students—in fact, in 1973-74 only 50 percent of the day students lived in dormitories. Some live with parents, some are married—often with children—and live in apartments on or off campus. The office of Commuter Affairs, by working with both students and administration, helps commuters solve the problems they face. This goes far beyond simply providing social activities. For example, after commuters pointed out that they missed the orientation to college life that resident students got, we arranged for a "live-in" during orientation week—a three day period before classes start when commuters live in the dormitories and receive much of the information they previously missed. But this office doesn't just sit back waiting for students to complain. A survey of commuters may point out other areas of need, and work begins in those areas. Our goal is to suit RIT equally to the life style of resident and commuting students.

COMMUTERS

For many RIT students college life includes having a job: cooperative work blocks for alternate quarters, part-time work (for the full-time student), or full-time work (for the part-time student). Married students usually have to mix school with work and the home—the Horton Child Care Center (See also page 25) was established so that children of married students can be registered for half-day sessions in a supervised educational program.

JOBS

RIT, like many other colleges, endeavors to make education beyond high school more widely available. Students who previously couldn't afford college, or whose schools never thought of preparing them for college, have increasing opportunities. Higher Education Opportunity Program (HEOP) at RIT gives disadvantaged students both economic assistance and counseling and tutoring. (See also page 170).

HEOP

The Veteran, often a little older and usually ready to move directly toward a career goal, will find at RIT a serious purpose in education where he can make up lost time with the minimum problems of adjustment. Many programs at the Institute help him deal with the machinery of the Veterans' Administration and with the opportunities the government gives him. There is also a Tech Vets club on campus.

VETERANS

The Foreign Students' Advisor's Office both helps foreign students with some of the problems they may encounter in college, and periodically offers special programs.

FOREIGN
STUDENTS

All these different interests and backgrounds in the student body are recognized and supported by various programs at RIT. As a student at RIT you'll find that you benefit from finding other groups with your special interests and from the programs that grow out of the diversity of student groups.

DIVISION OF STUDENT AFFAIRS

The Division of Student Affairs coordinates various programs which attempt to meet these diverse student needs. This division provides support services and educational programs for all phases of college living beyond the classroom experience. It is headed by a vice president and an associate vice president, and includes the following departments:

Physical Education and Athletics, Residence Halls, Student Health Services, College-Alumni Union, Religious Activities and the Chaplaincy, Counseling Center, Reading and Study Clinic, Protective Services, Central Placement Services, Higher Education Opportunity Program (HEOP), Commuter Affairs and Student Activities.

Life on campus is a living, as well as a learning, experience. Students, with the counseling of trained resident staffs, have their own governing organizations, initiate social programs, regulate the use of recreational facilities. A wide variety of athletic, social and professional activities is available for all students.

COMPLEMENTARY EDUCATION

Beyond the specific professional concentration, and the broadening courses in General Studies, Complementary Education—a developing third component of an RIT education—will attempt to stimulate, coordinate, and experiment with efforts leading to enrichment of your life at RIT. The goals of Complementary Education are: (a) to provide means for preparing you for the civic, aesthetic, personal, and social areas of life; of helping you to understand, as reflective and sensitive human beings, the meaning and value of what you do; and of providing learning opportunities that feature the usefulness and implications of technology as they apply to human needs and resources; (b) to meet your educational and developmental needs and interests which are not currently being met; (c) to define and emphasize the educational dimensions of programs with supportive learning opportunities; (d) to enhance the quality of your educational experience generally and your career preparation specifically; (e) to foster the affective dimensions of learning and development; and (f) to enhance faculty and staff effectiveness and sensitivity to your needs.

HOUSING

Housing Arrangements — RIT considers the living arrangements of its students to be a substantial ingredient in their total college education. More than one-half the full-time day student enrollment lives in Institute-operated residence halls. Present Institute policy states that all single students in their first, second, or third academic year, who are not living with their parents, are required to live in the Institute's residence halls unless they have been previously released by the Residence Halls Office. Resident students enrolled in cooperative employment programs are charged only for the period of occupancy.

For married students, a number of Institute-owned apartments located on the campus are available. The Riverknoll apartment and townhouse group permits consideration of fourth and fifth year single students for application. A booklet describing Riverknoll and Perkins Green apartments is available from the Married Student Housing Office, 113 Kimball Drive, Rochester, N.Y. 14623, telephone (716) 328-6455.

The Residence Halls — All residents participate in one of the Institute's board plans. The charges for residency and meals are included in the section on student expenses.

Each entering student is furnished information on housing arrangements, furnishings, and helpful hints by the Residence Halls Office when he or she is accepted.

Each women's house is located near men's houses, and most houses have visitation privileges. Alcoholic privileges are extended to each house upon a favorable vote of the residents. If you want to live in a house that does not have these privileges, you may request in advance that you be assigned to a limited privilege house. Such requests should be addressed to the Residence Halls Office.

Special Interest Houses (such as the Havarah House, primarily a Jewish Culture area, the Unity House, as a Black Culture area, the International House, the Photo House, and NTID Programmed Housing) continue the students' learning experience in the residence halls. Additional information will be sent to each applicant for housing in the packet containing his housing contract form.

Student Judicial Boards are charged with the responsibility of adjudicating infractions of residence halls rules and regulations. Cases in these Boards may be heard on a wide variety of infractions.

All new students (freshman and transfers) are required to pay the Orientation Fee as indicated in Table of Expenses. Orientation is a 4-6 day schedule designed to welcome the new student to the RIT community and its services. Orientation includes department meetings, registration, tours, seminars, lectures and various social events.

ORIENTATION
FOR NEW
STUDENTS

The Student Association is the governing body for students. It consists of three branches: an executive body comprised of the President of the Student Association and the President's Cabinet; the Student Senate, which unites the student body toward the formulation and expression of student opinion; and the Student Judiciary, which provides for the self-discipline of the student body.

STUDENT
ACTIVITIES

All full-time undergraduate students become members of the RIT Student Association through payment of the Student Association Fee. Part-time, special, or graduate students may become members of the Student Association, if they wish to participate in student-sponsored activities, by paying the Student Association Fee.

The College-Alumni Union, a primary focal point at the main entrance to the academic plaza, is designed specifically to service events sponsored by and for the entire campus community—students, faculty, administrative groups, alumni, and guests. A full-time staff is available to assist and advise the various individuals and groups in planning and coordinating their activities. In addition, a complete information service is located in the main foyer.

The three-level facility, the center of cocurricular activities, features the 525-seat Ingle Auditorium; a self-service bookstore; a complete recreation area for

bowling, billiards, table tennis; three separate dining areas which include a snack bar, a cafeteria, and a table service dining room; meeting rooms; lounges; and a music room. In addition to offices for the union staff, there are the offices of Placement, Protective Services, Student Affairs, Chaplains, the Coordinator of Clubs and Organizations, and most student organizations (College Union Board, Student Association, WITR radio, Techmila, and Reporter).

The College Union Board, composed of students, faculty, and College Union staff representatives, is responsible for providing a balanced program of activities that reflect and enhance the special social, cultural, and recreational needs of the campus community.

Major social events on the activities calendar include Fall Weekend, Homecoming, Winter Weekend, and Spring Weekend. Many other dances, parties, speakers, and events are sponsored by College Union Board, the Residence Hall Associations, the Greek Council, special interest clubs of many kinds, and departmental and professional associations, such as Alpha Chi Sigma, Delta Lambda Epsilon, Delta Sigma Pi, Phi Gamma Nu, and Sigma Pi Sigma. Alpha Phi Omega service fraternity has an active chapter. Two national sororities and eight national fraternities offer social activities and promote high scholastic and social standards among members.

A number of national technical associations have student affiliate chapters on the RIT campus. Frequently sponsored by parent chapters in Rochester, these societies play an important part in Institute life by bringing together students who have common interests in special subjects. The associations are both professional and social in purpose.

Sports – Intercollegiate sports play an important role in the college life of RIT. The "Tigers" are members of the National Collegiate Athletic Association (NCAA), Eastern College Athletic Conference (ECAC) and Independent College Athletic Conference (ICAC).

Varsity intercollegiate competition is offered in football, soccer, cross country, basketball, hockey, swimming, wrestling, fencing, bowling, rifle, track and field, trap and skeet shooting, baseball, tennis, golf, and lacrosse.

In addition, varsity competition has become a part of the women's athletic program, fielding teams in volleyball, basketball, softball, tennis and bowling.

The men's teams have done exceptionally well in the ICAC, which includes Alfred, Clarkson, Hobart, Ithaca, R.P.I. and St. Lawrence. The "Tigers" have won championships in swimming and track and field, and since joining the ICAC in 1970 have never lost a dual meet in this conference in either of these sports.

Intramurals play an important part in the everyday campus life. Competition takes place in flag football, basketball, hockey, softball and tennis.

See p. 171 for a full description of the Department of Physical Education and Athletics.

Student Publications – RIT students produce some of the most professional collegiate publications in the country. The Student Association Fee helps to finance most student publications, distributed to all full-time students.

The *REPORTER* is published by students weekly, except during examinations and holidays, and serves as the student news magazine.

TECHMILA, the student yearbook, contains a student-edited pictorial and written description of student life at the Institute during the year. The *REPORTER* and *TECHMILA* have consistently won state and national awards.

An *ACTIVITIES CALENDAR* is issued quarterly.

A *STUDENT HANDBOOK* is issued early in the year, as a cooperative effort of students and staff. This includes the *STUDENT DIRECTORY* listing addresses, telephone numbers, and other information about students. This becomes a handy year-long reference of activities and people.

These publications draw their talented staffs—artists, photographers, writers, managers, and printers—from the entire student body.

Religious Activities – The religious program is voluntary, active and enlightened, designed to minister to the varieties of religious faith in a responsible, attractive manner among future-oriented students. Chaplains representing the three major religious groupings maintain offices on the campus. They are available for pastoral counseling, advisory work, teaching, and sacramental ministries. There is a regular schedule of religious services on campus. Churches in the area have shown interest in establishing relations with students, and transportation to and from services may be arranged.

Hillel Foundation, Catholic Campus Ministry Association, and the Student Christian Movement, have local branches on campus, and other religious organizations are welcome to the facilities in the College-Alumni Union. Representatives of these campus organizations form the RIT Office of Campus Ministry. The Boswell Coffeehouse, jointly sponsored by the Student Christian Movement and the Catholic Campus Parish, provides entertainment and fellowship on Sunday evenings.

The Black Awareness Coordinating Committee is organized to foster an awareness of the role of Black men and women in the total society, and to create greater understanding among Black students at RIT. Each year the Committee sponsors various social and cultural programs which are designed to achieve these objectives.

Free University is an educational organization based on the concept of free education through generally unstructured programs. There are no costs, no exams, no registration, no attendance requirements, no grades. The only requirement is the single common bond among Free University participants: the individual's desire to learn, expand and share information. The programs include day and evening courses, seminars, a documentary film series, and a speaker series. The courses range from Kundalini Yoga to Basic Auto Repair and from Defensive Driving to the Economics of Pollution.

Free University is an autonomous student-funded and student-run organization. It operates as an alternative to the normal curriculum in those areas in which the Institute cannot or does not operate.

OTHER STUDENT
SERVICES

Counseling Center — RIT makes available its extensive counseling and testing facilities to all students registered in day or evening regular sessions at no additional charge. Any student may see a counselor promptly for assistance in solving a personal problem or in clarifying career plans. When appropriate, tests may be used to obtain more evidence about interests, abilities, aptitudes, and personality characteristics. In its offices on the second floor of the Eastman Building, the Counseling Center maintains a library of educational and occupational information for use by students.

The Counseling Center also maintains a satellite office in Nathaniel Rochester Residence Hall for evening counseling.

The reputation of the Counseling Center, also used extensively by local industry and the community, rests primarily on the assistance it renders to those who avail themselves of its services. Many a graduate achieved his career goal because he took advantage of the help thus available.

Reading and Study Clinic — RIT students have a unique opportunity to improve their reading efficiency, study techniques, vocabulary mastery, effective listening and critical thinking abilities, mathematical understandings, computational skills, writing competence, and general facility in the uses of the English language through individual or group instruction provided by the Clinic. In cooperation with the Counseling Center, the Reading and Study Clinic also provides counsel, diagnosis, and corrective-developmental background instruction for students not working up to capacity or whose achievement records are unsatisfactory because of needs in basic academic areas.

In addition to these programs, the Clinic provides individual tutoring in most college-level courses, a College Restoration Program (described in a later section) for RIT students on probation or liable to dismissal for academic reasons, and special programs for student groups and clubs.

Consultation, testing, and instructional services are free to all RIT students.

Student Health — It is of the utmost value to a physician to have detailed information concerning the past and present physical and emotional health of a patient. This must be provided on the medical form sent to all accepted undergraduate students. The form is to be returned to the Student Health Office before registration.

All medical information is strictly confidential between the student and Student Health Service, and will not be released in whole or in part without the former's consent. Exception is made only when reports are required by public health laws, or when basic information must be provided to substantiate insurance claims.

Two physicians and three nurses provide routine out-patient and emergency care at the Student Health Service from 8:30 to 4:30, Monday through Friday. From 4:30 to midnight, Monday - Friday, emergency care is provided in the Residence Halls by a Registered Medical Emergency Technician. At other times transportation to the emergency room of a local hospital will be provided as necessary. A consulting gynecologist is available at the Student Health Service one day a week.

The Student Handbook, available at registration, details benefits and limitations of services.

Health Insurance — Expenses for hospital care, consultations, X-rays, and laboratory tests are the responsibility of the individual student. Due to the high cost of such services it is imperative that they be covered by some sort of health insurance.

A brochure describing benefits of an Institute-sponsored plan is mailed to each student prior to registration. All students are automatically enrolled and billed unless a written refusal and proof of alternate insurance is provided to the bursar.

Horton Child Care Center — This Center is a developmental preschool for children of part-time and full-time students, faculty and staff at RIT. It is located in Riverknoll apartment housing, within easy walking distance of the academic buildings. Children ages 3 (by December 1) through 5 are accepted for either the morning or afternoon sessions. Inquiries and application can be made by writing the Director, Horton Child Care Center, Rochester Institute of Technology, Rochester, N.Y. 14623, or by phone (716) 328-6320.

Identification Card — All day students and evening students (CCE) are required to have an official Institute Identification Card. Your card must be carried with you at all times, and loss reported at once, to the Director of Student Activities.

All I.D. cards must be validated quarterly. Replacement of lost cards is \$5.00.

Those students having automobiles on campus will register these vehicles with the Protective Services Department at the time they first register for classes, or upon bringing the automobile onto campus for the first time. Failure to register a vehicle to be parked on campus will result in a \$20.00 fine for initial parking infraction. Fines are normally \$5.00, and, if unpaid or not otherwise reconciled, automatically charged to students' accounts.

AUTOMOBILE
REGISTRATION

There is a professional security and safety staff on duty 24 hours a day, all of whom are Institute employees and are members of the Student Affairs Division. While this staff constantly patrols all campus areas, RIT does not assume liability for lost or stolen personal effects of students, faculty or staff. We therefore urge you to maintain an insurance policy on your own or through your family insurance program for personal property casualty experiences away from home.

PROTECTIVE
SERVICES
DEPARTMENT

The main office of Protective Services is located on the mezzanine level of the College Alumni building. A satellite office is located in Grace Watson Dining Hall in the Residence complex.

For on-campus emergencies requiring immediate medical, fire-fighting, or law enforcement attention, call emergency telephone extension 3333. For routine matters call extension 2853.

CENTRAL
PLACEMENT
SERVICES

The function of the RIT Placement Service is to assist students in contacting potential employers and to provide career guidance. The office serves in four principal areas as a liaison between employers and students seeking positions. Those areas include: part-time jobs for students on the RIT campus or within the community, summer work, cooperative employment, senior and alumni placement.

This office will help you write resumes, complete application blanks and other appropriate forms, and prepare for interviews; it will provide cooperative employers with student grades; and it will follow up on the results of job search efforts. Employers are encouraged to visit the campus to recruit students for positions in their companies. The Central Placement Services office is on the mezzanine of the College-Alumni Union and is open twelve months a year.

The following services are of particular interest:

1. For students in the Cooperative Employment programs, the placement process and job counseling begin in the sophomore year as they prepare for their first jobs in their junior year. This procedure may vary slightly for transfer students since a student does not begin co-op work assignments until the academic department determines if he or she has the right sequence of courses.
2. Many of these students continue with their co-op employer by accepting an offer for permanent employment after graduation. While the number doing this will vary from company to company, it is safe to estimate that an average of 50-60 percent of students on co-op jobs will accept permanent positions with their co-op employer when they graduate.
3. The demand for RIT graduates continues to be strong even though it reflects the ups and downs of our economy to some extent. Students who make an effort to seek out their jobs have a rather good chance of success when one considers the senior, on-campus interviews that are conducted between the middle of October and the first of May each year and the literally hundreds of full-time, permanent positions that are filed with Central Placement Services each year by employers who come here to recruit, as well as employers who do not come here for recruiting.
4. Each year there are some graduating seniors who do not enter jobs or graduate study immediately after graduation because of any number of personal reasons. However, once these graduates decide to seek out a position, Central Placement Services stands ready to assist them in this search if they so desire.

The Wallace Memorial Library

The Wallace Memorial Library is a true multi-media learning center with expanded services and innovative procedures to increase its usefulness.

Particularly adapted to an institution of technology, the arts and sciences, the Wallace Library contains a great deal in addition to books. On the first floor, in addition to over 2,250 current magazines, are found video cassette players, microfilm and microfiche readers and disc and tape recordings; in the Media Resource Center there are other audio-visual tools using more varieties of media, all to enhance the learning process.

The Audio-Visual Department houses one of the finest art slide collections in the country, over 250 films and a variety of other non-print media. This department shows an average of 3000 other films for students in the classrooms each year and has preview facilities which faculty and students are welcome to use.

Located throughout the three floors of the library are over 900 student study stations. There are individual study carrels, group study rooms with TV sets, lounge areas and two music rooms. Also located in the library are computer terminals for use by students with academic requirements for this equipment.

The library contains a rapidly growing collection of materials on the deaf to serve the National Technical Institute for the Deaf and to support research by any who wish to pursue studies in the problems of deafness. Supplementing the main library are the graduate Chemistry Library, and the Melbert B. Cary, Jr. collection containing rare items of printing.

The Public Affairs Division

The Public Affairs Division at RIT is responsible for building bridges between campus and community. Its work is accomplished through several functional units. The Communications Services Department keeps the community informed of significant programs and activities on campus and tells interested audiences—prospective students, donors, employers and others—what they should know about RIT. There is a separate Office of Public Information for NTID. The Development Department has the specific charge of enlisting broad financial support for RIT which, like any other private university, is ultimately dependent on friends and benefactors to meet almost all its capital needs and a substantial portion of its operating income as well. The Community Relations Department establishes linkages between those on campus with a real interest or concern for the community and their counterparts in the Rochester area. The Office of Program Services renders a support function. The Alumni Office is related to the Institute and the Alumni Association.

The Public Affairs Department as a whole, working with all the colleges and other staffs, tries to build a concept of the community as a classroom and to build on RIT's long standing reputation as an institution deeply devoted to and involved with the community of which it is a part.



RIT Alumni Association

The RIT Alumni Association is an organization of more than 27,000 graduates and former students of the Institute. All graduates are automatically members of the Association.

Its objectives are to advance the growth and development of RIT through individual and group endeavor within industry and the community; to foster beneficial relationships among alumni, students, and the Institute; and to encourage outstanding academic and extra-curricular achievement by the undergraduates. To provide direction for alumni activities, an elected Executive Council serves as the governing body of the Association.

Homecoming each fall provides an opportunity for alumni reunions and a visit to campus. Other alumni events in Rochester include an annual "Ice Night," a Lecture Series, and Career Guidance Seminars. There is also a Travel Program available to alumni, and a Continuing Education Program (Alumni College), which aims to keep alumni up to date in their various professional areas.

Alumni in several U.S. cities organize activities of interest to local members, and special meetings are held at professional conventions attended by alumni.

Within the framework of the Association, the Alumni Fund Committee provides the organization through which alumni may assist the financial development of the Institute. The aid is channeled to development projects and provides support for the operation of the Institute. Alumni also serve the Institute's admissions effort by acting as career counselors, visiting their local high schools, and talking to students who have shown an interest in their particular fields.

The Office of Alumni Programs, located on the fourth floor of the George Eastman Building, is the center of alumni activity on campus. The Office maintains the alumni records, assists in conducting the affairs of the Association, and serves as the communications center and clearing house for all alumni activities. Alumni are always welcome at this Office.



RIT welcomes any qualified applicant regardless of race or religion.

The entrance data on the following pages is designed to assist you in making a self evaluation of your qualifications for admission to RIT, and to guide your selection of courses before high school graduation. If you lack any required subjects at the time of graduation, our Admissions staff will welcome the opportunity to suggest ways to meet your requirements.

For each program, we have indicated the (1) required high school subjects, (2) desirable elective subjects and other factors we consider, and (3) the 5th percentile, the 50th percentile and 95th percentile of the high school class rank and each of the SAT scores for our 1973 freshmen. Your high school record is usually the best predictor of success. If your high school rank is substantially below the 50th percentile for your program choice, some other factors that could indicate a potential for success are: (1) better than average grades in the required high school subjects, (2) an improving record of achievement as you progressed through high school, (3) above average admission test scores, (4) graduation from a highly competitive high school whose graduates are usually successful in college, and (5) post high school experience in service or employment that gives evidence of potential for success.

Indeed, the wide range of class ranks and test scores is indicative of how other factors are considered in making RIT admission decisions. Those at the lower end of the reported ranges were admitted on the basis of information other than school records and test scores.



ENTRANCE REQUIREMENTS FOR SPECIFIC COLLEGES SHOWN

**English: 4 years for all programs (except as your State requirements differ)					1973 RIT FRESHMAN CLASS				
College	School or Department	Required High School Subjects**		Desirable Elective Subjects	H.S. Rank	Math		Verbal	
		Mathematics	Science			CD LO	CD LO	CD LO	CD LO
	Business Administration Accounting	Elem. Algebra Inter. Algebra	1 year	Additional Mathematics and Science					
Business	Photographic Marketing	Elem. Algebra Inter. Algebra	1 year (Chemistry Preferred)	Additional Mathematics and Science					
	Food Administration, Hospital Dietetics	Elem. Algebra Inter. Algebra	1 year (Chemistry Preferred)	Biology; Additional Mathematics	23 62 98		350 530 660		320 450 590
	Retailing	Elem. Algebra Inter. Algebra	1 year	Business, Art and Speech Courses					
Engineering	Electrical, Industrial, Mechanical Engineering	Elem. Algebra Plane Geometry Inter. Algebra Trigonometry	Physics or Chemistry	Chemistry or Physics Additional Mathematics	30	76 98	470 590 730	350 490	0 640
Fine and Arts	Art and Design	1 year	1 year	Art Courses Portfolio of Original Art Work Required					
	School for American Craftsmen	1 year	1 year	Art or Industrial Courses. Portfolio of Original Work Required	24 7	0 94	340 500 640		330 470 620
General Studies	Social Work Criminal Justice	Elem. Algebra Inter. Algebra	1 year	Social Sciences Humanities	9 38 90		320 490	690	260 450 720
	School of Applied Science	Upper Division programs in Civil, Electrical and Mechanical Engineering Technologies; Associate Degree or equivalent to enter							
Institute College	Computer Science	*Elem. Algebra Inter. Algebra	1 year	Additional Mathematics and Science					
	Packaging	*Elem. Algebra Plane Geom. or Inter. Algebra	1 year	Printing Courses Art or Photography	34 73 97		430 560 760		370 490 720
Counseling Center	Career Decision	Requirements are dependent upon academic programs being considered. See applicable areas above and below.			1				
Graphic Arts and Photography	Photographic Arts and Sciences Photographic Science and Instrumentation	Elem. Algebra Plane Geometry Inter. Algebra Trigonometry	Physics or Chemistry	Chemistry or Physics Additional Mathematics	40 64 981		460 600 730	370 550 660	
	Photographic Illustration	1 year	1 year	Art Courses					
	Professional Photography	*Elem. Algebra Plane Geom. or Inter. Algebra	1 year	Physics or Chemistry Photography Additional Mathematics					
	Photo. Processing Management	*Elem. Algebra Inter. Algebra	Chemistry or Physics	Additional Mathematics and Science	27 61 96		410 550 710	370	500 670
	Biomedical Photography	*Elem. Algebra Plane Geom. or Inter. Algebra Trigonometry	Biology	Chemistry, Physics					
	Biomedical Communications	Upper Division; Associate degree or equivalent to enter							
	Printing	*Elem. Algebra Plane Geom. or Inter. Algebra	1 year	Printing Courses or Experience with School Publication Chemistry; Interest in Printing Additional Mathematics	14 46 89		340 490	0 630	300 420 580
Science	Biology	Elem. Algebra Plane Geometry Inter. Algebra Trigonometry	Biology	Physics or Chemistry Additional Mathematics C.E.E.B. Biology Achievement Test					
	Medical Technology	Elem. Algebra Plane Geometry Inter. Algebra Trigonometry	Biology	Physics or Chemistry	25 83 98		440 570 740	380	510 680
	Chemistry	Elem. Algebra Plane Geometry Inter. Algebra Trigonometry	Chemistry	Physics or Chemistry C.E.E.B. Chemistry Achievement Test					
	Chemical Technology	*Elem. Algebra	1 year	Additional Mathematics and Science	37 61 90		440 570 600	380	70 720
	Mathematics	Elem. Algebra Plane Geometry Inter. Algebra Trigonometry	Chemistry or Physics	Physics or Chemistry Additional Mathematics					
Physics	Elem. Algebra Plane Geometry Inter. Algebra Trigonometry	Chemistry or Physics	Physics or Chemistry Additional Mathematics C.E.E.B. Physics Achievement Test	25 83 98		440 570 740	380	510 680	

* Students accepted into these programs are asked to submit C.E.E.B. Level 1 Mathematics Achievement Test results before attending classes. The test results will be used only for placement in mathematics courses.

t Slides are required for mailed portfolios, and are preferred for sculpture and other crafts that would be difficult to carry for visit.

UNDERGRADUATE ADMISSION PROCEDURES

FRESHMEN	Submit your completed undergraduate application and non-refundable \$25 fee, official high school transcript and examination scores. Scores from Scholastic Aptitude Test (SAT) are preferred. American College Test (ACT) scores will be accepted. Forms for test registration should be obtained from your high school Guidance Office.
TRANSFERS	RIT welcomes transfers. Forty per cent of our students started college elsewhere. Admission procedures for transfers differ from freshmen as follows: <ol style="list-style-type: none">1. If you've already earned 16 or more college credits, you may submit your test scores or not, as you wish.2. If you've completed two or more years of college before RIT, you do <i>not</i> need to submit your high school transcript.3. You <i>do</i> need to submit official transcripts of all college study completed.4. Provide us with a list of the courses you are now taking and any others you expect to complete prior to coming to RIT.5. If your earlier study was outside New York State, send descriptive catalog(s) of previous study to our Admissions Office with your name on inside cover(s), so we may give you full credit.
TRANSFER CREDIT	If you are a transfer applicant, RIT will place you at the highest level at which your success can reasonably be expected. <ol style="list-style-type: none">1. We'll give you junior standing if you've earned an associate degree (A.A.S., A.S., and A. A.) or equivalent in programs comparable to the RIT program you choose. A cumulative average of "C" or better is normally required.2. We'll admit you to transfer adjustment study in summer to facilitate your transfer, particularly if you'll be majoring in Electrical Engineering, Art or Photography. See applicable program descriptions in this catalog.3. If you've had only a small amount of college study or will be making a significant program change when you come to RIT, we'll determine your credit on an evaluation of individual courses in which you earned a "C" grade or better. Your admission will be based on our best judgment of your probable success in your RIT program with your earlier grades being only part of the criteria we use.
CREDIT BY EXAMINATION	RIT grants credit for satisfactory scores on examinations covering objectives and context parallel to the RIT courses for which you seek credit. Usually these are CEEB Advanced Placement or College Level Examinations, New York State Proficiency Examinations, or RIT-prepared examinations. Contact our Director of Admissions for procedures.



Applications are accepted up to one year before you plan to start at RIT. Most students enter in September. Major exceptions are freshmen and transfers in the College of Business and the School of Printing, and transfers in most of the other colleges. RIT uses "rolling admissions"—when all required information is received you will be notified of one of the following actions:

1. Acceptance to your program of study. A transfer student will receive an evaluation showing credit granted and our estimate of time needed to complete your selected program.
2. Acceptance to program of study, but placed on a waiting list. When vacancies occur, those judged to be the strongest candidates are selected from the waiting list. The probability of vacancies on the waiting list is not predictable. Those remaining on waiting lists will be considered for future entrance dates if they specifically so request.
3. Deferral of action until more recent grades, test scores or other data requested are available.
4. Denial of Admission. RIT reserves the right to deny admission on the basis of any required admissions data.

You must submit a physical examination report before your first RIT registration on the form provided with your admission letter.

ACTION ON
APPLICATIONS

PHYSICAL
EXAMINATION

ADMISSION DEPOSIT **The \$100 non-refundable admission deposit reserves a place in our class and is credited to your first quarter's tuition. The due date will be indicated in your acceptance letter. For students entering in September, this is May 1, or within two weeks after acceptance, whichever is later.**

VISIT TO CAMPUS You are not required to visit our campus before we act on your application, but we do encourage you to see this modern 1300-acre campus and meet some of your faculty. For arrangements, call (716) 464-2831. For a general view of campus, request tour information. Tour guides are available at 10:30 A.M. and 2:30 P.M. Monday through Friday, and by advanced arrangements at other times by calling (716) 464-2604. You may make a personal appointment between 9:30 A.M. and 3:30 P.M. Monday through Friday for general academic program information and specific admissions information. For more detailed information about academic programs and related educational facilities and to meet your faculty, request an appointment with the Department or School of your interest.

FOREIGN STUDENTS **We welcome students from other countries. However, these students must be prepared to meet expenses in full as employment opportunities are limited and student aid is rarely available to foreign students.**

The admissions procedures above apply in full. In addition, applicants whose native tongue is not English are required to submit scores from the Test of English as a Foreign Language (T.O.E.F.L.) administered around the world by ETS, Princeton, New Jersey, U.S.A.

If not in English, all documents submitted must be accompanied by certified English translations.

If admitted and the financial statement is satisfactory, the student will be sent Form 1-20 for presentation to the American Consul in application for a "Non-Immigrant", "F" Student Visa. Foreign applicants completing their applications after April 1 seldom have enough time to finish all the necessary details in time for enrollment in September.

ENROLLMENT OF VETERANS **Study at RIT is approved under PL89-358 (Readjustment, 1966) PL815 or PL894 (Rehab) and PL634 (War Orphans). For benefits, a veteran may obtain an application for the Certificate of Eligibility from the nearest V. A. Office and submit it to the V.A. Office in Buffalo, New York.**

V. A. Form 21E-1995 "Request for Change of Program or School" is used when the veteran wishes to transfer schools.

REGISTRATION **You will be notified by mail of the date and hour of registration for your first quarter. Thereafter you are responsible for consulting the College Calendar for registration dates and times for subsequent quarters.**

Failure to report in person for registration at the time indicated may result in forfeiture of your place in classes at the Institute. The late processing fee is \$10.

Degrees

Rochester Institute of Technology stresses programs that lead to a high level of technical and professional competence. Programs of study are offered which lead to degrees at the associate, baccalaureate, and master's levels.

Associate Degree Programs – Upon successful completion of the requirements as indicated in the Program Outline of the Schools and Departments, students are awarded the Associate in Science or the Associate in Applied Science degree. Continuation to the baccalaureate depends upon satisfactory completion of the first two years with a cumulative grade point average of 2.00.

One Institute program – Biomedical Photography is a two-year program leading only to the A.A.S. degree. Chemical Technology is a three-year cooperative program leading to the A.A.S. degree.

Bachelor's Degree Programs – Six day colleges—Business, Engineering, Fine and Applied Arts, General Studies, Graphic Arts and Photography, and Science—offer four- or five-year programs leading to the B.S. or B.F.A. degrees, depending upon the curriculum. In all, about thirty different majors are offered in these colleges. For full description see the following sections grouped by colleges.

The newly organized Institute College includes the School of Applied Science, offering the B. Tech degree as upper-level (post-Associate) programs only; the Department of Computer Science and Technology offering the B.S. and B. Tech degrees; and the Department of Packaging Science offering the B.S. degree.

Graduate Degree Programs – The many programs leading to graduate degrees are fully described in the separate Graduate Bulletin.

A masters degree may be obtained in: Chemistry, Engineering, Electrical Engineering, Mechanical Engineering, Business Administration, Art Education, Fine and Applied Arts, Applied and Mathematical Statistics, Photographic Science and Instrumentation, Photography, Printing Technology, Printing Education, Instructional Technologies, and either Engineering Technology or Business Technology for Community College Faculty.

Grades representing the progress of the student in each of his courses are given GRADING on a Grade Report Form at the end of each quarter of attendance.

SYSTEM

The letter grades are as follows:

A Excellent	F Failure
B Good	Inc. Incomplete
C Satisfactory	W Withdrawn
D Minimum Passing	R Registered
E Conditional Failure	Aud. Audit

Quality Points – Each course has a credit hour value based upon the number of hours per week in class, laboratory or studio, and the amount of outside work expected of the student.

Each letter grade yields quality points per credit hour as follows:

A – 4 quality points C – 2 quality points
B – 3 quality points D – 1 quality point

E, F, and WF all count as 0 in computing grade point average (G.P.A.). R, Wp, and Inc. grades are not used in computing G.P.A.

The grade point average is computed by the following formula:

$$\text{G.P.A.} = \frac{\text{Total Quality Points Earned}}{\text{Total Quarter Credit Hours for which Registered}}$$

Scholastic Probation – A freshman whose grade point average for any quarter is below 1.6 is placed on scholastic probation for the following quarter. For second-year students the corresponding G.P.A. is 1.8; for third-, fourth-, and fifth-year students it is 2.0.

A student falling below the minimum G.P.A. twice in any one year will be suspended from Day College at the end of the school year unless his cumulative G.P.A. for one year is above probationary level. A student who, at the end of a school year, has accumulated three or more probations may be suspended for one school year at the discretion of the director of the school or department in which he is registered. A student with a G.P.A. below 1.00 in any quarter may be suspended at the discretion of the department head.

A first- or second-year student on scholastic probation shall not represent the Institute in any activity or hold office in any organization under jurisdiction of the Student Council. A student, third-year or higher, with G.P.A. below 2.0 in any quarter will be on scholastic probation; if his cumulative G.P.A. is 2.5 or higher he may participate in cocurricular activities. Failure to earn a G.P.A. of 2.0 or higher in the next school quarter means that participation in above activities must be discontinued.

Disciplinary Probation – Students are expected to conduct themselves at all times in such a way as to reflect credit on themselves and the Institute. Any student who has been guilty of flagrant violation of good conduct or good taste may be warned, placed on probation, or in serious cases dismissed from the Institute.

Students on probation may not represent the Institute in any inter-collegiate activity or hold office in any organization under the jurisdiction of the Student Association.

Class Attendance and other Rules – Students are expected to fulfill the attendance requirements of their individual programs. Rules and regulations relating to conduct in the residence halls, and use of general campus facilities are issued directly by the appropriate offices of the Institute.

The Administration reserves the right to be the sole judge of what shall constitute a violation of the regulations as well as the right to fix penalties. In certain cases, the penalty may be dismissal.

Courses and time schedules are subject to change to meet the requirements of the student's occupational objective. Attendance at Saturday classes may be required. The Institute reserves the right to alter any of its courses at anytime.

The following general requirements apply to students who are candidates for an undergraduate degree:

1. Fulfillment of department requirements.
2. In cooperative programs a minimum period of cooperative employment as specified by the department.
3. Compliance with Institute policy on Physical Education.
4. Full payment or satisfactory adjustment of all financial obligations.
5. Attendance at the Institute as a regular student for at least one year prior to graduation. In the full-time programs this means a student must be regularly registered as a degree candidate for the last three quarters prior to graduation in the department in which he seeks his degree. In the cooperative programs a student must be regularly registered as a degree candidate at least two academic quarters of the final year.
6. Attendance at Convocation to be cited for either the Associate or Baccalaureate Degree.
7. Students admitted with advanced standing from other institutions must earn, after transfer, a minimum of 45 quarter credit hours in courses taken at the Institute.

GRADUATION
REQUIREMENTS,
GENERAL

A.S. and A.A.S. Requirements – The requirements for the Associate in Science and Associate in Applied Science degree are:

1. A minimum number of quarter hours as required by the department or school in which the student is enrolled, but in no case shall this be less than 90 quarter hours of credit.
2. A minimum Grade Point Average of 2.0 in the departmentally approved program.

GRADUATION
REQUIREMENTS

B.S., B.F.A. and B. Tech. Requirements – The requirements for the Bachelor of Science, Bachelor of Fine Arts or Bachelor of Technology degree are:

1. A minimum number of quarter hours as required by the department or school in which the student is enrolled, but in no case shall this be less than 180 quarter hours of credit, except for Upper-Division programs, a minimum of 90 quarter hours.
2. A minimum Grade Point Average of 2.0 in the departmentally approved program.

Masters Degree – See separate Graduate Catalog.



Expenses and Financial Aids

GENERAL EXPENSES

It will be noted from the tables on this and following pages that tuition and fees vary among the schools and departments. Travel costs and items of individual choice differ widely with the individual. The Estimates for Freshman Year give known costs as of the publication of this catalog. Detailed tables of charges for tuition and fees for upperclass years are found on the following pages.

Books and Supplies – These vary widely with the program followed, and to some extent with electives chosen. Those having minimal expenses (e.g. sciences, business) will average \$130-\$150; in the arts or crafts this may be in the neighborhood of \$250-\$275; in photographic illustration or professional photography a realistic allowance is \$600 in addition to cameras (but in photographic science and photo finishing, expenses are the minimal).

ESTIMATES OF EXPENSES FOR FRESHMEN, 1974-1975

Based on 3 Academic Quarters, as Resident Students!

Department or Major	Tuition	Fees*	Room [†] and Board	Total**
Electrical, Industrial and Mechanical Engineering.....	\$2400	\$130	\$1488	\$4018
Business Administration, Retailing.....	2325	130	1488	3943
Food Administration.....	2325	130	1488	3943
Art and Design.....	2400	130	1488	4018
School for American Craftsmen	2400	130	1488	4018
Printing.....	2400	130	1488	4018
Photography (other than Photographic Science).....	2400	130	1488	4018
Photographic Science.....	2400	130	1488	4018
Biology, Chemistry, Math, Medical Technology Physics.....	2400	130	1488	4018
Chemical Technology (2 Quarters).....	1600	105	992	2697
Computer Systems.....	2400	130	1488	4018
Social Work, Criminal Justice.....	2400	130	1488	4018
Career Decision Program	2400	130	1488	4018
Packaging Science	2400	130	1488	4018

[†] Rochester area students who live at home and commute to campus should substitute their own estimates for room and board.

* Does not include \$30.00 Orientation Fee.

** It is estimated that an additional \$500 should be allowed for clothing, recreation, travel, and incidentals.

^{††} Double Room and Board (20 meals per week).

It must be emphasized that totals shown are estimates.

Tuition and Fees 1974-1975

COOPERATIVE PROGRAMS

College or School	Department	Year	Tuition Per Year	Feest	Total Per Year	Quarterly Payments*		
						1st, Qtr.	2nd, Qtr.	3rd, Qtr.
ENGINEERING	Electrical, Industrial, or Mechanical	1 & 2	\$2,400	\$130	\$2,530	\$880	\$825	\$825
		3,4 5	1,600	105	1,705	880	825	
BUSINESS	Bus. Admin., Food Admin., or Retailing	1	2,325	130	2,455	855	800	800
		2 ^B *	2,325	130	2,455	855	800	800
		3	1,550	105	1,655	855	800	
		4	2,325	130	2,455	855	800	800
SCIENCE	Biology, Chemistry, Mathematics, or Physics	1 & 2	2,400	130	2,530	880	825	825
		3, 4 5	1,600	105	1,705	880	825	
SCIENCE	Chemical Technology	1,2,3	1,600	105	1,705	880	825	
INSTITUTE COLLEGE	Computer Science and Technology	1 & 2	2,400	130	2,530	880	825	825
		3, 4, 5	1,600	105	1,705	880	825	
	School of Applied Science	1&2	(Completion of 2 years, at another college)					
		3, 4 5	1,600	105	1,705	880	825	
GENERAL STUDIES	Criminal Justice Social Work	Each Year	2,400	130	2,530	880	825	825

Tuition and Fees — Tuition and fees paid to the Institute covers approximately 60-70 percent of the actual expense of a student's education. The rest of the cost is borne by the Institute through income on its endowment and from the gifts of alumni and other friends.

The tuition at RIT is computed on a quarter basis.

The Institute reserves the right to change its prices without prior notice.

Tuition and Fee payments are due on the following dates:

Fall Quarter September 9, 1974

Spring Quarter March 10, 1975

Winter Quarter December 16, 1974 Summer Quarter To be

announced at a later date.

OTHER PROGRAMS

College or School	Department	Year	Tuition Per Year	Feest	Total Per Year	Quarterly Payments*		
						1st, Qtr.	2nd, Qtr.	3rd, Qtr.
FINE & APPLIED ARTS	Art & Design Sch. for American Craftsmen	Each Year	\$2,400	\$130	\$2,530	\$880	\$825	\$825
GRAPHIC ARTS & PHOTOGRAPHY	Photographic Arts and Sciences Printing Photographic Processing	Each Year	2,400	130	2,530	880	825	825
BUSINESS	Photographic Marketing	Each Year	2,325	130	2,455	855	800	800
SCIENCE	Medical Technology	1, 2,3	2,400	130	2,530	880	825	825
		4	(Full-Time Internship in approved hospital)					
COUNSELING CENTER	Career Decision	1 Only	2,400	130	2,530	880	825	825
INSTITUTE COLLEGE	Packaging Science	Each Year	2,400	130	2,530	880	825	825

If Printing students elect to follow the voluntary cooperative plan, tuition is charged only for quarters at RIT.

Note: Books and supplies are *not* shown in the tables above, since they vary so much with each program. It is, however, essential that this be remembered in budgeting for upperclass years. This is especially true for students in Arts and Photography.

References to tables on facing page.

t Does not include \$30 Orientation Fee

* In Cooperative Programs, students pay tuition only for quarters at RIT; normally two per year in alternate quarters.

** Students in College of Business attend classes for 11 quarters over the 4-year program. Payments are due for quarters assigned to school, which may differ in time but not in quantity from above chart.

Any undergraduate carrying over 18 quarter credit hours will be charged regular tuition plus \$68 for each quarter credit hour over 18.

Tuition for part-time undergraduate students (carrying fewer than 12 quarter credit hours) and special students is at the rate of \$68 per quarter credit hour. The Activity/Union Fee and Athletic Fee are not assessed.

A graduation fee of \$15 is payable at the beginning of the Spring Quarter of each year in which the student expects to receive an associate's or bachelor's degree. The graduation fee charge for those receiving a master's degree is \$20 which also includes rental of the master's hood.

TUITION
PAYMENT

Tuition and fees may be paid by mail in advance and students are requested to take advantage of these arrangements. Payments should be made by check, money order, or New York draft, payable to Rochester Institute of Technology.

ESTIMATED QUARTERLY BILL – PROCEDURE

1. Student is mailed the "Estimated Quarterly Billing Packet" approximately one month prior to the quarterly due date.
2. The packet will contain all the necessary information and forms required to complete the Estimated Bill accurately and quickly.
3. Upon receipt of the Institute copy of the Estimated Bill and the student's payment, the Bursars Office will credit the payment of the student account, clear the student for registration and hold the Estimated Bill for verification with the actual charges as processed by the Registrar, Food Service, the Housing Office, the Student Aid Office, and departments.
4. Three weeks after registration day a statement of account will be prepared and mailed to those students having an unpaid balance. These students will automatically be placed on the Deferred Payment Plan (see below).

DEFERRED PAYMENT PLAN – PROCEDURE

1. Students can automatically participate in this plan by remitting 50% of their Estimated Bill. The participation fee is \$5.00 and is applicable to both full and part-time (see item No. 2 below) students.
2. Upon receipt of the above, the Bursars Office will clear the student for registration.
3. The remaining 50% or the balance due must be paid during the fifth week of classes.
4. Late Payment Penalty Charge—\$25.00. This charge will be assessed against all delinquent accounts (deferred accounts unpaid after the fifth week of classes, except as noted below).
5. The following groups of students would be excluded from the Deferred Payment Plan charges providing the appropriate papers are on file in the Bursars Office: N.T.I.D. students, Veterans, students whose expenses are paid by a state's Office of Vocational Rehabilitation, and students whose tuition is paid by an outside concern e.g., KNIGHT Plan, Company Billing.

Advance deposits are non-refundable. The acceptable reasons for withdrawal with refund during a quarter are:

REFUND POLICY

A. FULL REFUND:

- (1) ACTIVE MILITARY SERVICE—A student called to *active military service* during the first 8 weeks of the term may receive a full tuition refund. If called after the eighth week, he may elect to complete the course by making special arrangements with both his instructor and Department, or to withdraw and receive a full tuition refund. If he withdraws, he will have to repeat the course at a later date.
- (2) ACADEMIC SUSPENSION—Students generally register for a quarter before grades for the first quarter are available. If such a student later finds that he has failed the first quarter, he will be given a full refund. It remains the student's responsibility to contact his Department to assure that the withdrawal form and refund are properly processed.

B. PARTIAL REFUND:

A *partial refund* will be made during a quarter if withdrawal is necessitated for one of the following reasons:

- (1) illness, certified by the attending physician, causing excessive absence from classes.
- (2) withdrawal for academic reasons at the request of the Institute during a quarter.
- (3) transfer by employer, making class attendance impossible.

C. PARTIAL REFUND SCHEDULE

<i>WITHDRAWAL</i>	<i>% OF REFUND</i>
During the first week of classes	90%
During the second week of classes	75%
During the third week of classes	60%
During the fourth week of classes	50%
Fifth and subsequent weeks	no refund

The partial payment and other fees are not refundable. All withdrawals from courses must be made in writing; otherwise, the refund of tuition will not be given. The student should not consider himself "officially withdrawn" until he receives the student's copy of the *Change of Record Form*. The postmark date of a letter to the dean or the date on which a change of record form is properly completed shall be the date of "official withdrawal" used to determine the refundable amount.

Students enrolled in chemistry laboratory classes must purchase Breakage Deposit Cards at \$5.00 each. In most cases the total will not exceed \$15.00 for the year. This requirement applies to students of all departments who are enrolled in chemistry courses.

OTHER FEES AND
GOOD FINANCIAL
STANDING

Students enrolled in courses requiring the use of the photographic chemistry laboratories are required to make a \$10.00 locker key deposit.

A Residence Halls Association Fee, currently \$7.00, is established by the student governing bodies to be used for the benefit of students in residence. With the first bill there is also a Security Deposit, explained in the Housing Office information.

Students, former students, and graduates are in good financial standing when all fees, tuition, fines, are paid in full. They may re-register, receive grade reports, transcripts, and other forms of recognition or recommendation from the Institute.

The Institute reserves the right to modify its tuition and fee charges.

TEXTBOOKS AND SUPPLIES

Textbooks and supplies may be purchased at the RIT Bookstore where stocks include recommended items. General guidelines are given with the introductory statement on expenses. The major portion of the expenditures for books and supplies is made during the first week of school. In anticipation of this expense, students should have sufficient funds available.

FINANCIAL AID

SCHOLARSHIPS AND FINANCIAL AIDS

It is RIT's intent that qualified students interested in its programs will be considered for financial assistance according to financial need. Normally this is arranged as a package of aid, consisting of scholarship, grant, loan and/or employment, in conjunction with outside scholarships such as New York State Scholar Incentive Awards and Regents Scholarships, or other regional awards or federal assistance. The RIT Scholarship Committee bases its award on scholastic achievement as well as need. The full range of Veterans Administration benefits are available.

RIT's cooperative programs offer participating students an opportunity to make a very significant contribution to their total college expenses—from 40% to 60% during co-op years—in addition to the valuable experience gained on the job.

Additionally, through the Central Placement Office, there are many part-time positions available where this is needed to help defray expenses. Those needing the income from full-time employment should consider attending RIT's College of Continuing Education evenings.

Inquiries for all types of financial assistance should be directed to the RIT Office of Student Aid.

NON-RESIDENTS

There are no additional charges or fees for RIT students coming from states other than New York.

SCHOLARSHIPS AND LOANS

The RIT Board of Trustees has provided a scholarship fund from which general awards are made to entering freshman and transfer students. Transfer student applicants currently in college should advise the RIT Admissions Office that they are to be considered as *scholarship* applicants, and request action on their Admissions application before March 1. Other scholarships have been provided by the gifts of alumni and friends, and the income from permanent funds.

Scholarships from these sources may vary in size from \$100 to \$1,200. The amount of the scholarship and the recipients are determined on a basis of entrance examination data, the high school record, and the need for financial aid. These scholarships are awarded for one year only. Students receiving scholarship aid may apply for renewal of their scholarship as upperclassmen. Entering freshmen may be eligible for awards if they rank in the upper 25% of their high school graduating class, while eligibility for enrolled students and transfer is contingent upon a cumulative grade point average of 3.00 through the Winter Quarter of the year preceding the one for which the award is requested. In each case the stipend is based on financial need.

A number of industry- or business-sponsored scholarships are available to entering students in specific departments. In some cases the scholarships are restricted to students from a particular geographic area. In general, scholarships of this type are for three to five years of study, and the student must maintain a specified academic average. Scholarships in this category vary in size from \$300 to \$4,000.

Applying for Aid – Applications for scholarship aid will be processed only after the applicants have been accepted for admission to the Institute. Applicants, however, should not wait until accepted to file applications.

Students are urged to submit all required admissions data to the RIT Admissions Office and file Parent's Confidential Statement with College Scholarship Service no later than January 1, of the year prior to entrance. Copies of these forms must be received in the Student Aid Office no later than March 1; applications received after March 1, cannot be considered.

Regents Scholarships and Scholar Incentive Awards – New York State Regents Scholarships may be used at the Institute. Many students also obtain financial help from scholarship funds provided by foundations, service clubs, or other organizations in their home communities.

New York State Scholar Incentive Awards may also be used at the Institute.

New York State residents wishing to apply for these awards should write for information and application forms to Regents Examination and Scholarship Center, State Education Department, 99 Washington Ave., Albany, N. Y. 12210.

A number of educational loan funds are available to Institute students. Some of these provide interest-bearing loans which are repayable after graduation. Included are the National Direct Student Loan program, and Guaranteed Student Loans provided by some of the states. Students are required to make use of the plan within their own state, if one is available.

Federal Financial Assistance – Federal assistance consists of grants, loans, and on-campus employment, based on demonstrated financial need. Inquiries regarding these programs should be directed to the RIT Student Aid Office.

Tuition Payment Plans – Monthly payment programs are available through a number of commercial banks and agencies.

More complete information about scholarships and loans is contained in the Institute publication, "Student Expenses and Financial Aid." This may be obtained from the Director of Student Aid.

College of Business



College of Business

EDWARD A. JOHNSON, *Dean*

The College of Business is composed of the School of Business Administration, the School of Retailing, and the Department of Food Administration and Tourist Industries Management. The programs reflect the world of business, which has become increasingly complex, and advance new theories with business application. Ideas that were not even formulated five years ago are viewed as routine today. New knowledge is constantly evolving that must become part of the student's education. While incorporating this new knowledge into the program, it is also important that the student's education have lasting value.

RESOURCES Each faculty member in the College of Business brings a combination of professional education and sound practical experience to his course work. The faculty has a personal interest in the progress of individual students and in assisting each student to achieve maximum benefit from his program of study. Freshman students are assigned to faculty advisers who provide friendly counsel during this period of adjustment.

Physical facilities include well-appointed classrooms and laboratories and modern equipment. Student learning is extended further through other facilities, including an up-to-date and complete library of books and periodicals, as well as through use of fabric collections, films, professional speakers, and field trips applicable to the various fields of study.

Professional Memberships — Memberships in professional organizations contribute to the quality of the programs in the College of Business. The School of Business Administration maintains membership in the American Association Collegiate Schools of Business Assembly, and the Middle Atlantic Association of Colleges of Business Administration. Programs in the Department of Food Administration are recognized by the American Dietetic Association. The School of Retailing is a member of the American Collegiate Retailing Association, an organization to promote the profession of retail management and to maintain high standards of education for the retail profession.

PLAN OF EDUCATION Cooperative employment is an integral part of the program in the College of Business. Under the supervision of the Director of Cooperative Education of the college, each student obtains four quarters of practical work experience in many and varied phases of his field of interest, not limited to the local area. Every effort is made to help the student find a position that will further his career goals. Since this work experience is related to the student's total career objective, he gains more stimulation from his class work and is prepared to assume some increased responsibility during successive work periods. He also develops judgment and initiative, keener understanding of his major field and the special phases which interest him, and greater possibility of moving more rapidly toward his goal after graduation.

The Cooperative Plan – Cooperative employment arrangements for students in B.S. degree programs are made prior to the Summer Quarter of the second year. Students are then assigned to A and B Sections; students in Section A work on their cooperative jobs in the Summer Quarter while those in Section B attend classes. The two sections interchange at the beginning of the Fall Quarter of the third year when students in Section A attend classes and those in Section B are cooperatively employed. This interchange of study-work periods continues until the Summer Quarter of the fourth year when both groups attend classes. The study-work section to which the student is assigned is designated by the Director of Cooperative Education, College of Business.

	FALL	WINTER	SPRING	SUMMER
<i>1st year</i>	RIT	RIT	RIT	VACATION
<i>2nd year</i>	RIT	RIT	RIT	RIT
				"A" WORK
<i>3rd year</i>	"B" WORK	RIT	"B" WORK	RIT
	RIT	"A" WORK	RIT	"A" WORK
<i>4th year</i>	"B" WORK	RIT	"3" WORK	RIT
	RIT	"A" WORK	RIT	RIT

Admission Requirements – High school graduates applying to the College of Business should have had Mathematics, including Elementary and Intermediate Algebra. Those applying to the Department of Food Administration and Tourist Industries Management should have had Chemistry in addition to the required Mathematics. While a college preparatory course in high school is preferred, graduates of other programs are considered. While most students enter at the beginning of the Fall Quarter, a modest number may be accepted at the beginning of the Winter or Spring Quarters.

Graduation Requirements – The minimum academic requirements for the Bachelor of Science degree in the College of Business are:

A.A.S. Degree – The degree of Associate in Applied Science is awarded upon earning a minimum grade point average of 2.0 in the departmentally approved program.

TWO-YEAR B.S. Degree – The Bachelor of Science degree is granted if the student has (X) TRANSFER earned a minimum grade point average of 2.0 in the departmentally approved PROGRAM program, and (2) completed four quarters of supervised field education assignments as approved by the Director of Cooperative Education, College of Business.

Transfer student must (1) complete a minimum of 102 quarter credit hours with an earned minimum grade point average of 2.0 in the departmentally approved program, and (2) complete two quarters of approved cooperative education assignments.

Junior standing will be granted to qualified students from accredited institutions who possess an associate degree or its equivalent and who wish to continue their education for the baccalaureate degree. Students interested in Business Administration, Retailing, or Food Management may complete all requirements for the B.S. degree in two years, which includes six academic quarters and two quarters of cooperative employment.

Due to the special requirements of the *Accounting* program and the *Dietetics* program, the amount of transferrable credit and the estimated time to complete work for these degrees must be determined by evaluation of each individual's record. In every instance, however, it is the policy of the College to recognize as fully as possible past academic accomplishments of each student.

GRADUATE
PROGRAM

The College of Business offers master's degree programs in Business Administration and Accounting on a part-time and full-time basis. The programs are professional in nature and acquaint the student with all aspects of business management as well as offering a concentration in a field of specialization. Specific details are contained in the Graduate Bulletin, available upon request.

School of Business Administration

OBJECTIVES The basic objective of the School of Business Administration is to create and provide experiences which lead to the continuing growth of the individual in achieving his or her occupational, social, and personal goals. The programs offered provide for an understanding of the concepts essential to competence in business management.

To provide an education that will allow the graduate to perform and grow in this dynamic and complex field of business, the programs in the School of Business Administration are designed to: (1) make students aware of the world about them; (2) open and stimulate students' minds to initiate—and welcome—new ideas and techniques; (3) provide mastery in a marketable skill.

Each program includes courses in communications, social science, and the humanities, plus a "core group" of business subjects. This provides for an understanding of the complex relationships of forces at work in society today, as well as the relationships existing within the business organization. The student

also concentrates in depth in a particular subject area, with each successive course built upon accumulated knowledge and skills, providing a challenge equal to the student's capabilities.

The Cooperative program provides the balance between theory and experience and plays an integral part in the total education of the individual.

Accounting – The accounting major has two options: the public accounting option and a general accounting option. The public accounting major has been registered with the State Education Department of New York, which means that graduates meet the requirements for candidacy for the Certified Public Accountant examination.

The general accounting option has been designed for students with varied interests. Not only has the curriculum been designed to help prepare students for the Certificate in Management Accounting examination as administered by the Institute of Management Accounting of the National Association of Accountants, but also the student has the opportunity to gain a more indepth knowledge in taxation, international accounting, and accounting for non-profit organizations by electing courses in a seminar series.

Business Administration – The curriculum offers the student the opportunity to major in Consumer Services, Finance, Management, Marketing or Photographic Marketing.

Two-Year Transfer Program – Qualified students from accredited institutions who possess an associate degree or its equivalent may earn the baccalaureate degree in two years, which includes six academic quarters and two quarters of cooperative employment.

Due to the special requirements of the *Accounting* program, the amount of transferable credit and the estimated time to complete work for these degrees must be determined by evaluation of each individual's record. In every instance, however, it is the policy of the College to recognize as fully as possible past academic accomplishments of each student.

A.A.S. Degree – The degree of Associate in Applied Science is awarded upon earning a minimum grade point average of 2.0 in the departmentally approved program.

B.S. Degree – The Bachelor of Science degree is granted if the student has (1) earned a minimum grade point average of 2.0 in the departmentally approved program, and (2) completed four quarters of supervised field education assignments as approved by the Director of Cooperative Education, College of Business.

Transfer student must (1) complete a minimum of 102 quarter credit hours with an earned minimum grade point average of 2.0 in the departmentally approved program, and (2) complete two quarters of approved cooperative education assignments.

PROGRAMS OF
STUDY

GRADUATION
REQUIREMENTS

Program Outline

**ACCOUNTING PROGRAMS
(Common Curriculum, First Two Years)**

NOTE: F—FALL S-SPRING W—WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
BBUA-210 Financial Accounting.....	4			FIRST YEAR
BBUB-201 Management Concepts.....	4			
BBUQ-291, 292 Mathematics.....	4	4		
GSSE-301, 302 Economics 1, II.....		4	4	
ICSS-200 Introduction to Computer Science.....			4	
*General Studies Electives • Lower Division.....	4	4	4	
Science Electives.....	4	4	4	
*Physical Education Elective.....	0	0	0	
BBUA-308, 309, 310 Intermediate Accounting 1, II, III.....	4	4	4	SECOND YEAR
BBUA-331 Cost Accounting 1.....			4	
BBUQ-351, 352 Statistics 1, II.....		4	4	
BBUF-503 Financial Problems.....		4		
BBUF-441 Financial Management.....	4			
BBUM-263 Marketing Principles.....	4			
*General Studies Electives.....	4	4	4	
Physical Education Elective.....	0	0	0	

tUpon successful completion of the second year, the Associate Science degree is awarded.

*See p. 89 for General Studies requirements.

tSee p. 171 for policy on Physical Education.

Program Outline

GENERAL ACCOUNTING MAJOR**

NOTE: F—FALL S-SPRING W—WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	SR or F	W or S	SR	
BBUA-332 Cost Accounting II.....	4			THIRD YEAR
BBUA-422 Tax Accounting.....		4		
BBUB-401 Behavioral Science.....		4		
BBUE-405 Microeconomics.....	4			
Business Electives.....	4	4		
*General Studies Electives - Upper Division.....	5	5		
BBUA-313 Auditing.....	4			FOURTH YEAR
BBUB-404 Administrative Policy.....			4	
BBUB-407 Technical Society and Legal Environment.....			4	
BBUB-434 Operations Management.....	4			
Business Electives.....	4	8	4	
*General Studies Electives ■ Upper Division.....	5	10	5	

*See p. 89 for General Studies requirements.

**Students interested in the Certificate of Management Accounting should include BBUA-554, BBUB-536 and BBUB-353 in their electives.

Program Outline

CERTIFIED PUBLIC ACCOUNTING MAJOR

NOTE:		QUARTER CREDIT HOURS			
F—FALL W—WINTER	S—SPRING SR—SUMMER	F	W	S	
		SR or F	W or S	SR	THIRD YEAR
BBUA-332 Cost Accounting II.....		4			
BBUA-421 Advanced Accounting.....			4		
BBUA-422 Tax Accounting.....			4		
BBUB-301 Business Law I.....		4			
BBUE-405/406 Micro or Macro Economics Business Elective.....		4	4		
*General Studies Electives - Upper Division.....		5	5		
BBUA-313 Auditing.....		4			FOURTH YEAR
BBUA-423 C.P.A. Problems.....			4		
BBUB-302 Business Law II.....			4		
BBUB-401 Behavioral Science.....				4	
BBUB-404 Administrative Policy.....				4	
BBUB-407 Technical Society and Legal Environment.....				4	
BBUB-434 Operations Management.....		4			
Business Elective.....		4			
*General Studies Electives ■ Upper Division.....		5	10	5	

*See p. 89 for General Studies requirements.

BUSINESS ELECTIVES
(Each gives 4 Quarter Credit Hours)

ACCOUNTING

- BBUA-331 Cost Accounting 1
- BBUA-422 Tax Accounting
- BBUA-554 Seminar in Accounting

ECONOMICS

- BBUE-407 Managerial Economics
- BBUE-408 Business Cycles and Forecasting
- BBUE-443 Recent Economic Policies
- BBUE-509 Advanced Money and Banking
- BBUE-530 Labor Economics
- BBUE-554 Seminar in Economics

FINANCE

- BBUF-502 Money and Capital Markets
- BBUF-503 Financial Problems
- BBUF-504 International Finance
- BBUF-507 Security Analysis
- BBUF-508 Portfolio Management
- BBUF-510 Financial Institutions
- BBUF-554 Seminar in Finance

MANAGEMENT AND QUANTITATIVE METHODS

- BBUB-450 Multinational Management
- BBUB-531 Labor Relations
- BBUB-534 Purchasing
- BBUB-535 Planning and Decision Making
- BBUB-536 Organization Theory
- BBUB-554 Seminar in Management
- BBUQ-353 Statistics III
- BBUQ-481 Mathematics

MARKETING

- BBUM-510 Consumer Services Analysis
- BBUM-511 Consumer Services Seminar
- BBUM-550 Marketing Management Problems
- BBUM-551 Marketing Research
- BBUM-552 Advertising
- BBUM-553 Sales Management
- BBUM-554 Seminar in Marketing
- BBUM-555 International Marketing
- BBUM-556 Marketing Logistics
- BBUM-557 Comparative Marketing

NOTE: Additional electives may be chosen from the School of Retailing or approved electives from other Colleges of the Institute. See special Photo Management-Photo Marketing curriculum given in cooperation with the School of Photographic Arts and Sciences.

Program Outline

BUSINESS ADMINISTRATION MAJORS

NOTE: F-FALL S-SPRING W—WINTER SR-SUMMER	QUARTER CREDIT HOURS		
	F	W	S
BBA-210 Financial Accounting.....	4		
BBA-211 Managerial Accounting.....		4	
BBUB-201 Management Concepts.....			4
BBUQ-291, 292 Mathematics.....	4	4	
GSSE-301, 302 Economics 1, II.....		4	4
ICSS-200 Introduction to Computer Science.....			4
*General Studies Electives ■ Lower Division.....	8	4	4
*Physical Education Elective.....	0	0	0
BBUQ-351, 352 Statistics 1, II.....		4	4
BBUB-401 Behavioral Science.....			4
BBUE-381 Money and Banking.....	4		
BBUM-263 Marketing Principles.....	4		
Business Electives.....		4	8
*General Studies Electives ■ Lower Division.....	4	4	
Science Electives.....	4	4	
*Physical Education Elective.....	0	0	0
BBUB-434 Operations Management.....	SR or F 4		H or S
BBUE-405, 406 Micro or Macroeconomics.....	4		
BBUF-441 Financial Management.....			4
Business Electives.....	4		8
*General Studies Electives.....	5		5
BBUB-404 Administrative Policy.....	SR or F	W or S	SR
BBUB-407 Technical Society and Legal Environment.....		4	4
Business Electives.....	8	8	8
*General Studies Electives.....	10	5	5

**FIRST
YEAR**

**SECOND
YEAR†**

**THIRD
YEAR**

**FOURTH
YEAR**

†Upon successful completion of the second year, the Associate in Applied Science degree is awarded.

*See p. 89 for General Studies requirements.

\$See p. 171 for policy on Physical Education.

Program Outline

two-year transfer program for a.a.s. degree graduates

A minimum of 102 quarter credit hours must be completed at RIT in order to qualify for the B.S. degree.

NOTE: F—FALL S—SPRING W—WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
BBUE-405/406 Micro or Macro Economics.....			4	THIRD YEAR
BBUF-441 Financial Management.....			4	
BBUQ-410, 411 Quantitative Methods 1, II	4	4	4	
Business Electives.....	4	4	4	
*General Studies Electives ■ Upper Division.....	5	5	5	
Science Electives.....	4	4	4	
tPhysical Education Elective.....	0	0	0	
	SRorF	W or S	SR	FOURTH YEAR
BBUB-404 Administrative Policy.....			4	
BBUB-407 Technical Society and Legal Environment		4		
BBUB-434 Operations Management.....	4			
Business Electives.....	8	8	8	
*General Studies Electives - Upper Division.....	5	5	5	

tSee p.171 for policy on Physical Education.

*A minimum of 6 Upper Level General Studies courses (30 quarter credit hours) must be taken at RIT.

Note: A minimum of 8 quarter credit hours of Science must be earned. If Science transfer credit is allowed, student must take a comparable number of hours in either Business or General Studies.

Transfer students with insufficient background in Accounting, Economics, Management and/or Marketing will be required to take the following courses in place of business electives:

- Accounting: BBUA-210, 211
- Economics: GSSE-301 and/or 302
- Management: BBUB-401
- Marketing: BBUM-263

Photographic Marketing Management Program
(COLLEGE OF BUSINESS)

The program of study in photographic marketing is designed to provide students with a thorough knowledge of the photographic process in order that they may have an understanding of how their products work. At the same time, they will be involved in learning the economic, financial and marketing principles necessary to successfully establish and maintain a prosperous photographic wholesale or retail business.



CAREER This four-year baccalaureate program is directed towards marketing, merchandising, promotion and personnel management in the photographic dealer industry; however, those choosing to terminate after two years are awarded an A.A.S. degree and should qualify for a store manager's position.

Program Outline

photographic marketing management majors

NOTE: F—FALL S-SPRING W—WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
BBUA-210 Financial Accounting.....	4		4	FIRST YEAR
BBUA-211 Managerial Accounting.....			4	
ICSS-200 Introduction to Computer Science.....			4	
BBUQ-291, 292 Mathematics.....	4	4	4	
GSSE-301, 302 Economics 1, II.....	4	4	4	
PPHM-201, 202, 203 Basic Principles of Photography.....	4	4	4	
†General Studies Electives—Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
BBUQ-351, 352 Statistics 1, II.....	4	4	4	SECOND YEAR
BBUB-401 Behavioral Science.....			4	
BRER-211 Retail Organization and Management.....		4		
PPHM-310 Survey of Machine Processing.....			2	
BBUB-201 Management Concepts.....	4			
PPHM-320, 321 Mechanics of Photographic Hardware 1, II.....		4	4	
†General Studies Electives—Lower Division.....	8	4	4	
^Physical Education Electives.....	0	0	0	
BBUB-434 Operations Management.....	4			THIRD YEAR
BBUE-381 Money and Banking.....		4		
BBUE-405/406 Micro or Macro Economics.....			4	
BBUF-441 Financial Management.....			4	
BBUM-263 Marketing Principles.....	4			
BBUM-552 Advertising.....		4		
†General Studies Electives—Upper Division.....	5	5	5	
Professional Electives.....	4	4	4	
BBUB-404 Administrative Policy.....			4	FOURTH YEAR
BBUB-407 Technical Society and Legal Environment.....	4			
BBUM-553 Sales Management.....		4		
†General Studies Electives—Upper Division.....	5	5	5	
Professional Electives.....	8	8	8	

†Sep. 89 for General Studies requirements.

tSee p. 171 for policy on Physical Education.

Total of 196 quarter credit hours is required for the B.S. degree.

Upon successful completion of second year, the Associate of Applied Science degree is awarded.

It is recommended that students seeking the baccalaureate degree spend the summer of their junior year in a work block-type program.

Professional electives may be selected from either the College of Business or School of Photographic Arts and Sciences, in consultation with advisor.

Refer to School of Photographic Arts and Sciences for descriptions of Photography courses.

The Department of Food Administration and Tourist Industries Management

GEORGE T. ALLEY, *Director*

Since 1885 the Institute has offered courses in the scientific preparation and service of food. A career in the food and hospitality industries has become highly specialized in the business world. Efficient and sophisticated management is vital and requires a diversity of skills from many disciplines, including accounting, economics, computer science, chemistry, business management, behavioral science, food preparation, nutrition, sanitation and other related areas. The program of the Department of Food Administration and Tourist Industries Management has developed as a result of the continuing effort, demanded by changes in the field, to keep this program current and relevant.

It is the mission of the Department of Food Administration and Tourist Industries Management to prepare students to excel in their chosen profession by developing:

- (1) theoretical and technical knowledge essential to successful attainment of professional, executive level management;
- (2) the ability to apply knowledge and original thinking to solving management problems;
- (3) the skills and techniques of leadership;
- (4) an awareness and desire for a lifetime of learning;
- (5) an intellectual spirit for constructive thought and action in building a good life and effective citizenship.

The program is designed to prepare the individual to cope with changing business conditions and to present both theoretical and practical approaches to the diverse needs of the Hospitality Industry. To increase competence in the student's specialization through actual field experience, a cooperative employment plan is required. Under the co-op plan, students alternate periods of study at RIT with periods of employment in the Food and Hospitality Industry. Cooperative employment provides financial assistance, stimulates classroom experience and serves as a preview for determining career direction in the industry.

Food and Tourist Industries Management — The hospitality service industries employ more people than any other industry in the nation. These industries cover the wide scope of public feeding, lodging and tourism. The emphasis in this program is upon course work which is common to food and tourist industries and is directed at those aspiring to managerial positions in restaurants, hotels, motor lodges, resorts, clubs, airlines, colleges and schools, and other types of accommodation businesses. Professional work in any of these areas relies heavily on the principles of efficient management. The program provides the student with the

OBJECTIVES

COOPERATIVE
EDUCATION

PROGRAMS
AND CAREER
OPPORTUNITIES

knowledge, concepts, skills and experience necessary to qualify for well-paying and challenging employment opportunities.

Modern learning laboratories on campus and in selected industry facilities provide students with the opportunity to integrate theory and real world experience. All laboratory work is supervised by department faculty.

Dietetics – Dietetics has become a profession covering a broad spectrum of interests and service. Many in this field have positions of management, not only on the staffs of hospitals and nursing homes, but also in supervisory posts in government agencies—national, state, and local—and in the growing field of community nutrition. Some of the larger national restaurant chains have a dietitian in a responsible staff position. Numerically the principal employment for the dietetics major is in hospitals, as a member of the medical team.

Those students who complete the Dietetics program meet the academic requirements for membership in the American Dietetic Association.

TWO-YEAR TRANSFER PROGRAM

Transfer Students Entering with A.A.S., A.S. or Equivalent Degree.

Students who possess an associate degree or its equivalent in related fields from accredited institutions and are interested in continuing their education for the baccalaureate degree in Food Administration and Tourist Industries Management may enter with junior standing and complete the B.S. degree in two years. This includes six academic quarters and two quarters of cooperative employment.

Due to the special professional requirements of the American Dietetic Association, the amount of transferable credit and estimated time to complete work for the B.S. degree must be determined by evaluation of each individual's record.

Transfer Students Entering With Less Than Two Years of Transfer Credit.

Transfer credit is granted for courses with a grade of C or better which are acceptable for the program.

GRADUATION REQUIREMENTS

A.A.S. Degree – The degree of Associate in Applied Science is awarded upon earning a minimum grade point average of 2.0 in the departmentally approved program.

B.S. Degree – The Bachelor of Science degree is granted if the student has (1) earned a minimum grade point average of 2.0 in the departmentally approved program, and (2) completed four quarters of supervised field education assignments as approved by the Director of Cooperative Education, College of Business.

Transfer student must (1) complete a minimum of 102 quarter credit hours with an earned minimum grade point average of 2.0 in the departmentally approved program, and (2) complete two quarters of approved cooperative education assignments.



Program Outline

FOOD ADMINISTRATION AND
tourist industries management

NOTE: F-FALL W—WINTER	S-SPRING SR-SUMMER	QUARTER CREDIT HOURS			
		F	W	S	
BFAM-211,212 Food Principles 1, II		4	4		FIRST YEAR
SBIG-210 Human Biology 1.....		4			
SCHG-215, 216 General Chemistry 1,11.....		4	4		
BFAD-213 Nutrition Principles.....				4	
BBUQ-291 Mathematics.....			4		
BBUA-210 Financial Accounting.....				4	
ICSS-200 Introduction to Computer Science.....				4	
*General Studies Electives—Lower Division.....		4	4	4	
^Physical Education Elective.....		0	0	0	
BBUB-201 Management Concepts.....		4			SECOND YEAR
GSSE-301, 302 Economics 1, II			4	4	
BBUQ-351, 352 Statistics 1, II			4	4	
BFAM-311 Equipment.....		4			
BFAM-312 Food and Beverage Purchasing.....			4		
BFAM-313 Quantity Food Production Management.....				4	
Elective.....				4	
*General Studies Electives—Lower Division.....		8	4		
^Physical Education Elective.....		0	0	0	
BBUB-434 Operations Management.....			SR or F	SR	THIRD YEAR
BBUB-401 Behavioral Science.....			4		
BFAM-415, 416 Food Science 1, II.....			4		
Electives.....			4		
*General Studies Electives—Upper Division			5		
BBUB-407 Technical Society and Legal Environment.....		4			FOURTH YEAR
BBUB-404 Administrative Policy.....				4	
BFAM-411 Food Management Problems.....		4			
BFAM-511 Food Merchandising.....			4		
Electives.....		4	4	8	
*General Studies Electives—Upper Division		5	10	5	

¹See p. 89 for General Studies requirements.

^JSee p. 171 for policy on Physical Education.

Program Outline

DIETETICS

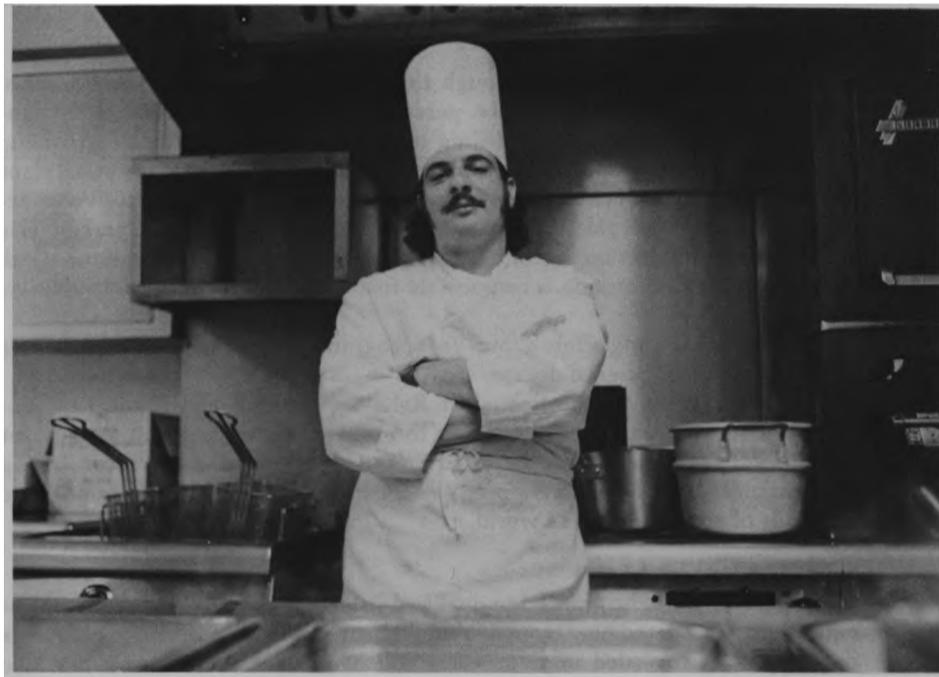
NOTE: F-FALL S-SPRING W—WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
BFAM-2U, 212 Food Principles 1, II	4	4		FIRST YEAR
SBIG-210 Human Biology 1.....	4			
SCHG-215, 216 General Chemistry 1, II.....	4	4		
SCHO-221 SCHO-221 Organic Chemistry			4	
BBUQ-291 Mathematics 1.....		4		
ICSS-200 Introduction to Computer Science			4	
BFAD-213 Nutrition Principles.....			4	
♦General Studies Electives—Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
BBUA-210 Financial Accounting	4			
BBUB-201 Management Concepts.....	4			
GSSE-301, 302 Economics 1, II		4	4	
SBIG-211 Human Biology II.....			4	
BFAM-311 Equipment.....	4			
BFAM-312 Food Purchasing.....		4		
BFAM-313 Quantity Food.....			4	
BBUQ-351, 352 Statistics 1, II.....		4	4	
♦General Studies Electives—Lower Division.....	4	4		
^Physical Education Elective.....	0	0	0	
BBUB-434 Operations Management.....	SR or F	W or S	SR	THIRD YEAR
SBIC-404 Introductory Microbiology.....	5	4		
BFAM-415, 416 Food Science 1, II.....	4	4		
SCHB-301 Biochemistry.....	5			
♦General Studies Electives (SR or Fall—Lower Division, W or S—Upper Division).....	4	10		
BBUB-407 Technical Society and Legal Environment.....	4		4	FOURTH YEAR
BBUB-404 Administrative Policy.....				
BFAM-411 Food Management Problems.....	4			
BFAM-511 Food Merchandising.....		4		
BFAD-531 Advanced Nutrition.....		4		
BFAD-533 Diet Therapy.....		4		
BFAD-519 Educational Principles and Methods.....		4		
BBUB-401 Behavioral Science.....			4	
♦General Studies Electives—Upper Division	10		10	

♦See p. 89 for General Studies requirements.
 }See p. 171 for policy on Physical Education.

PROFESSIONAL ELECTIVES-FOOD MANAGEMENT AND DIETETICS

BFAD-535	Nutrition Seminar	BFAM-425	Introduction to the Tourist Industry
BFAM-310	Mankind in Search of Food	BFAM-517	Ethnic Foods
BFAM-314	Sanitation and Safety in Food Operations	BFAM-554	Seminar in Food and Tourist Industries
BFAM-422	Hotel/Motel Management	BFAM-555	Research Problems
BFAM-423	Management Systems for the Hotel/Motel Industry		

Additional approved electives may be taken from other colleges of the Institute.



School of Retailing

The major objective of the School of Retailing is to educate young men and women for *business management competence* in order that their education will help them to achieve middle and upper-middle management positions after some years of on-the-job experience, as well as providing a base for beginning management positions. Business management competence is defined for the School of Retailing as a broad understanding of commercial activities as well as acquisition of specialization in marketing functions.

To achieve this major objective, the student should have: (1) basic understanding of the major functional areas of business, finance, manufacturing, and marketing; (2) depth of knowledge of the marketing process for the retail industry; (3) a broad background in natural and social sciences and in the humanities; (4) an understanding of the tools common to most management functions; and (5) an awareness of the need for life-long learning.

Goals which can be reached through this program fall into five broad areas: merchandising, operations, finance, personnel, and sales promotion. Merchandising covers the selection and selling of both fashions and home furnishing; operations covers the operation and maintenance of the company's physical plant as well as customer services; finance includes accounting, accounts receivable, accounts payable, credit sales, collection, statistical and internal audit; personnel is responsible for selection, training, placing, advancement, and welfare of all employees; sales promotion is responsible for advertising, display, and publicity.

PROGRAM The School of Retailing offers a four-year program in Retail Management leading to the Bachelor of Science degree.

Established in 1923, the School of Retailing offered one of the first undergraduate programs in the country to prepare young men and women for positions of responsibility in the retail field. Throughout the years, continuing study assures that the program prepares for the fast-moving developments and demands of today's business world.

**TWO-YEAR
TRANSFER
PROGRAM**

Junior standing will be granted to qualified students with an associate degree or equivalent in a related field from accredited institutions. The Bachelor of Science degree will be awarded in two years, which includes six academic and two quarters of cooperative field education. The student's program is determined on a basis of his previous education and field interest.

GRADUATION REQUIREMENTS Degree requirements in the School of Retailing for the A. A.S. degree and the B.S. degree are exactly the same as in the School of Business Administration and the Department of Food Administration and Tourist Industries Management. (See earlier pages).

Program Outline

retailing majors

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
BBUA-210 Financial Accounting.....	4			FIRST YEAR
BBUB-201 Management Concepts.....	4			
BBUQ-291 Mathematics 1.....		4		
BRER-211 Retail Organization and Management.....		4		
BRER-212 Merchandising.....			4	
GSSE-301, 302 Economics 1, II.....		4	4	
ICSS-200 Introduction to Computer Science.....			4	
* General Studies Electives - Lower Division.....	8	4	4	
^Physical Education Elective.....	0	0	0	
BBUM-263 Marketing Principles.....	4			
BBUQ-351, 352 Statistics 1, II.....	4	4		
BBUM-552 Advertising.....			4	
Business/Retail Electives.....		8	8	
* General Studies Electives - Lower Division.....	4		4	
Science Electives.....	4	4		
^Physical Education.....	0	0	0	
BBUB-434 Operations Management.....	SR or F	WorS	SR	THIRD YEAR
BBUB-401 Behavioral Science.....	4	4		
Business/Retail Electives.....	8	8		
* General Studies Electives - Upper Division.....	5	5		
BBUB-407 Technical Society and Legal Environment.....	4			FOURTH YEAR
BBUB-404 Administrative Policy.....			4	
BBUM-551 Marketing Research.....	4			
BRER-410 Research Problems 1.....		4		
BRER-411 Research Problems II.....			4	
Business/Retail Electives.....	4	4	4	
* General Studies Electives - Upper Division.....	5	10	5	

NOTE: An Interior Design option program is available to students interested in this field.

*See p. 89 for General Studies requirements.

tSee p. 171 for policy on Physical Education

RETAILING PROFESSIONAL ELECTIVES
(Each carries 4 Quarter Credit Hours)

BRER-511	Textiles (Basic)	BRER-532	Interior Design 1
BRER-512	Textiles (Fashion Fabrics)	BRER-533	Interior Design II
BRER-513	Textiles (Home Furnishing Fabrics)	BRER-534	Interior Design (History)
BRER-521	Fashion (History)	BRER-535	Interior Design (Advanced)
BRER-524	Fashion (Accessories)	BRER-545	Color and Design (Display)
BRER-523	Fashion (Current)	BRER-554	Seminar in Retailing
BRER-531	Interior Design (Basic)		

College of Continuing Education

GENERAL INFORMATION The College of Continuing Education is dedicated to serving the community by adapting the resources of the Institute to anticipate and to meet widely varying needs for continuing education. To perform the several tasks required by such a purpose, the College works in close cooperation with all other colleges of the Institute and with local and national agencies and industries. The resulting courses and programs are sometimes quite different from those offered by the full-time colleges; all credit courses are stimulating and rigorous, and are registered with the State Education Department.

The College of Continuing Education is primarily concerned with providing appropriate educational opportunities for those who cannot, or choose not to, attend full-time day college. The typical student of the College—if there can be one in a learning community of such diversity—is mature, is employed, usually in business or industry, and is married—often a parent, and more than occasionally a home owner. In four out of five instances, there is some form of tuition aid from one's employer.

A variety of demands for continuing education have prompted identification of three quite separate functions and the creation of administrative units specifically designed to perform these functions: The Evening Session, the Extended Services Division, and the Summer Session.

EVENING SESSION The Evening Session conducts classes leading to either a diploma or degree or to a personal goal made attainable by a choice of one or more courses. Programs leading to the diploma of the Institute are available in twenty-seven fields, as diverse as management and electronics, sociology and photography. There are also available nineteen possible options leading to the Associate in Applied Science degree, including programs in graphic arts, industrial technology (with options in mechanical, electrical, electromechanical, and building construction), management (with options in health institutions, industrial marketing, transportation and traffic, production, and personnel), business (with options in accounting, business administration, and money and finance). Thirteen programs lead to the Bachelor of Science degree, and among the available majors are management (with options in industrial marketing, transportation and traffic, production and personnel), graphic arts (with options in design, photography, and printing), business (with options in business administration and accounting), and applied science (with a choice of electrical, mechanical, chemistry, or mechanical-industrial options). There is also a program leading to the Bachelor of Technology degree in Electrical or Mechanical Technology, and one leading to the Bachelor of Science degree in Audio-Visual Communications. Both programs are designed primarily for transfer students with an associate's degree. The Evening Session also offers one curriculum leading to the Associate in Arts in General Education, and another leading to the Master of Science in Applied and Mathematical Statistics.

Not all courses in the Evening Session are intended for degree-seeking students, and it is well for any potential student to arrange for an interview with one of several available counselors to explore his vocational and academic goals. Counselors are available for such conferences throughout the calendar year. If you would like further information about the Evening Session, call (716) 464-2234, or consult the telephone directory page in the Catalog of the College of Continuing Education.

The Extended Services Division of the College of Continuing Education provides opportunities for special educational experiences for men and women by involving both community and Institute resources to meet needs of professional organizations, agencies, industries, business and government. Its offerings may be at the graduate or undergraduate level in credit or credit-free intensive courses, conferences, or workshops. The Division also administers study via television, as well as foreign study programs.

Administrative functions of Extension include Professional Development Programs, Off-Campus College Credit Programs, In-Plant Courses, Community Development and Urban Extension, Office of Continuing Studies for Women, and the Center for Employer-Employee Relations.

For a catalog or special bulletins on how Extended Services can serve your needs, write Extended Services Division, 50 West Main Street, Rochester, New York 14614, or call (716) 262-2716.

The Summer Session is responsible for the administration of summer offerings exclusive of the regular Summer Quarter. In a variety of schedules and courses, the Summer Session attempts to meet the summer objectives of regular full- or part-time students from RIT or other institutions. Students with the necessary prerequisites may enroll in any of the schedules available in the summer: the Summer Day Sessions (of varying lengths), or the Summer Evening Quarter. These are listed in a separate Summer Session catalog.

The Institute's summer programs provide sufficient flexibility to fit into almost anyone's available time. For further information write the Director of Summer Session, College of Continuing Education, or call (716) 464-2205.

To provide further information, the College of Continuing Education publishes its own catalog, which contains more specific information about its courses and programs. If you would like to receive a copy of it, or of other descriptive information, simply write to the College of Continuing Education, One Lomb Memorial Drive, Rochester, New York 14623, or call (716) 464-2234.

**EXTENDED
SERVICES****SUMMER
SESSION**

College of Engineering

RICHARD A. KENYON, *Dean*

FIVE-YEAR PROGRAMS

The College offers three five-year cooperative programs leading to the Bachelor of Science degree with majors in electrical, industrial, mechanical engineering.

The programs offered by the College of Engineering are planned to prepare students to fit into present-day industrial and community life, and to lay a foundation for graduate work in specialized fields. This is accomplished by offering curricula which are strong in fundamentals, yet lead to specialization in the junior and senior years, and maintain a balance among humanistic-social subjects, the physical sciences, and professional courses.

RESOURCES

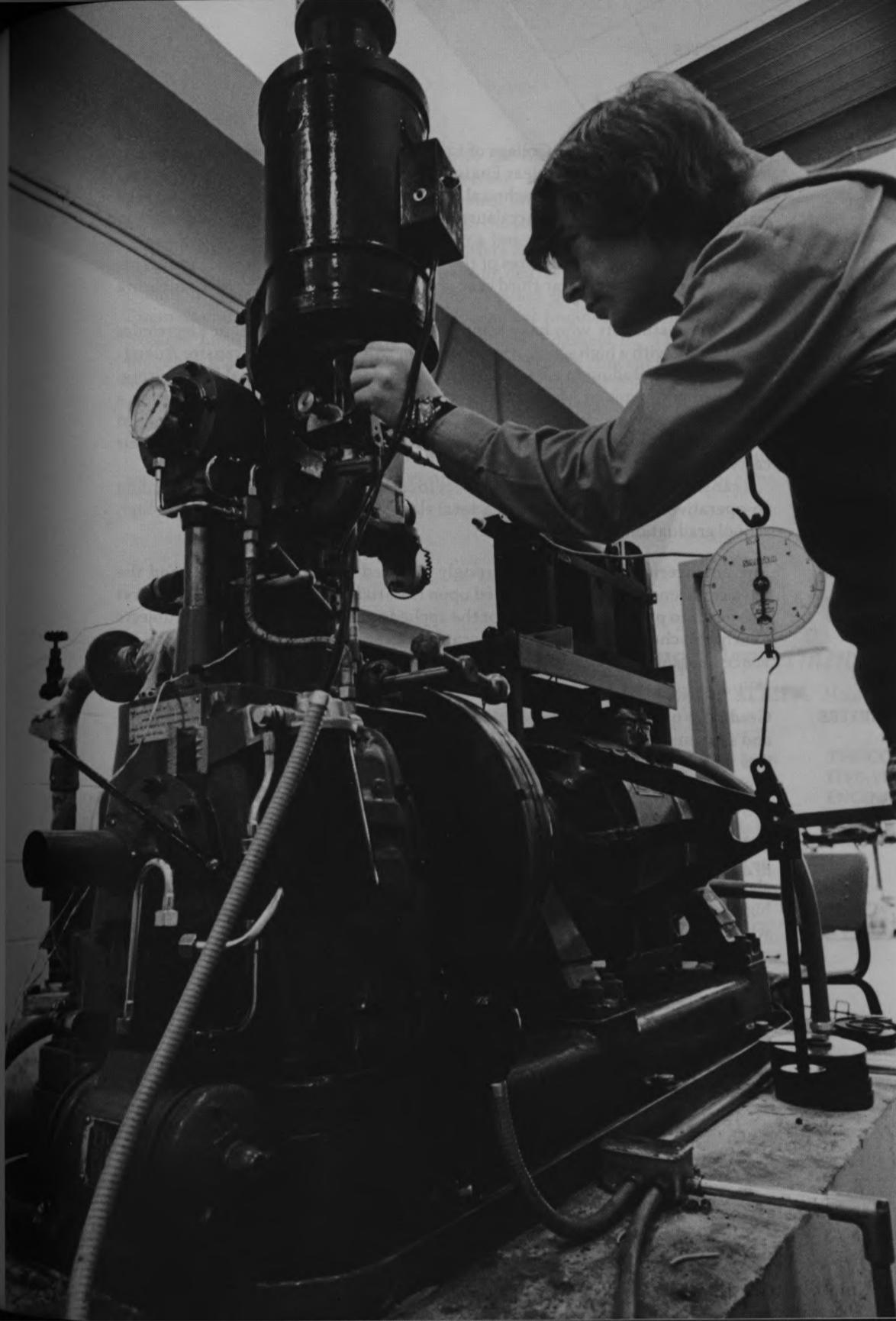
The Electrical Engineering Department operates laboratories for experimental work in circuits, machinery, electronics, microwave communications, and control systems. Laboratories for work in metallurgy, heat power, air conditioning, materials testing, precision measurements, control instruments, machine tools, and extensive computing facilities are available for the Mechanical Engineering and Industrial Engineering Departments.

ACCREDITATION

The programs of study leading to the Bachelor of Science degree in Electrical Engineering and Mechanical Engineering are accredited by the Engineers' Council for Professional Development. The college is a member institution of the American Society for Engineering Education.

The Cooperative Plan – As described on page 13, students in the five-year cooperative programs attend classes during the Fall, Winter, and Spring Quarters of their first and second years. Prior to the beginning of the third year, students are assigned to A and B Sections; in any given quarter, one section follows cooperative employment while the other attends classes. Employment arrangements are made for each student by the Coordinator of Employment for the college. The diagram illustrates the cooperative program as offered by the College of Engineering.

	FALL	WINTER	SPRING	SUMMER
<i>1st and 2nd yrs.</i>	RIT	RIT	RIT	VACATION
<i>3rd, 4th, A</i>	RIT	WORK	RIT	WORK
<i>yrs. B</i>	WORK	RIT	WORK	RIT
$\begin{matrix} \text{1st} \\ \vee \\ \text{2nd} \end{matrix}$	RIT	WORK	RIT	----
	WORK	RIT	RIT	----



Transfer Programs – The College of Engineering at RIT has for many years admitted graduates from two-year Engineering Science and Technology programs at community colleges and technical institutes. The rapid integration of these transfer students into the baccalaureate programs in significant numbers has provided an added dimension and a uniqueness to the Engineering College.

In virtually all cases, graduates of the two-year Engineering Science programs are able to enter the regular third year program in any of RIT's three engineering departments.

For those students who have completed programs in Electrical or Electronics Technology with a high scholastic average, there is a three-year Transfer Adjustment Schedule leading to a Bachelor of Science degree in Electrical Engineering. Qualified graduates of Mechanical Technology programs desirous of earning a Bachelor of Science degree in Mechanical Engineering take an individualized transfer program that best suits their particular background and meets their career objectives.

Transfer students can normally expect to complete the B.S. program, including co-operative work experience, in a total elapsed time of five years beyond high school graduation.

ORIENTATION

The engineering programs are strongly oriented toward mathematics and the physical sciences. Emphasis is placed upon the study of these subjects in the first two years to provide foundation for the applied sciences and engineering subjects which are scheduled later in the programs. All seniors are advised to take the advanced engineering test of the Graduate Record Examination prior to graduation.

CAREERS

Graduates qualify for professional work in design and development of equipment and systems, research and experimental work, supervision of technical projects, and managerial positions in industry. An increasing number of graduates continue their education for the Master of Science or the Doctor of Philosophy degree.

Entrance Requirements (B.S.) – Applicants for the engineering programs must be high school graduates, and must have completed elementary and intermediate algebra, plane geometry, trigonometry, and either physics or chemistry while in high school. Advanced algebra, solid geometry, and both physics and chemistry, while not required, are highly desirable. The applicant's proficiency in the required entrance subjects should be high since these provide a good index of his ability to cope with the more advanced courses in the science programs.

All applicants are required to take entrance examinations as described in the general section of this catalog.

Graduation Requirements – The minimum requirements for the Bachelor of Science degree in the College of Engineering are:

1. Satisfactory completion of the program with no failing grades.
2. A minimum number of quality points equal to at least *twice* the number of quarter hours required.

Graduate Degrees – Programs leading to the Master of Science degrees are offered in both the Electrical Engineering and Mechanical Engineering Departments. The programs may be pursued on a part-time or full-time basis since the majority of courses are offered in the late afternoon and early evening.

In addition, the College of Engineering offers a post-baccalaureate professional program leading to the Master of Engineering degree. The degree is without discipline designation, and study may be pursued in such areas as Electrical Engineering, Industrial Engineering, Mechanical Engineering, Environmental Studies, Engineering Management, and Systems Engineering. The program is unique in that it extends the undergraduate cooperative concept to the graduate level in an industrial internship for which academic credit is granted. Designed as a full-time program, the Master of Engineering degree may also be pursued on a part-time basis by engineers employed in local industry.

For further information on graduate programs in the College of Engineering, refer to the Graduate Bulletin or contact the Director of Graduate Programs, College of Engineering.

Electrical Engineering Department

JAMES E. PALMER, *Head*

The Bachelor of Science program in Electrical Engineering at RIT has been developed in direct response to the increasing diversity in talent and training required of engineers by society. While providing a sound engineering core, the program offers significant opportunity for personalized curriculum planning. Individual study plans may range from intense specialization to broad general coverage with ample opportunity for interdisciplinary activity in all cases. An integrated cooperative work/study program adds to this flexibility to produce a mature graduate with well-developed academic and industrial perspective.

Approximately eighty percent of the academic content of the curriculum in Electrical Engineering is devoted to the establishment of a solid foundation in science, mathematics, engineering fundamentals and the core electrical engineering studies in electromagnetics, energy conversion, circuit theory and electronics, and in the humanities. The remaining twenty percent of the academic program consists of professional and free elective courses from which the students assemble individually tailored programs with the professional assistance and guidance of their faculty advisors. The students are encouraged to use the entire Institute catalog in planning this portion of their programs. In this way they can be assured that their education reflects the strongest combination of the Institute's facilities with their own interests and aptitudes.

THE COOPERATIVE
FIVE-YEAR
ENGINEERING
PROGRAM

TRANSFER PROGRAMS
IN ELECTRICAL
ENGINEERING

Engineering Science Transfer Program – A powerful force in current engineering education is the emergence of the Community College, offering two-year programs in Engineering Science leading to the Associate in Science degree. In New York State these programs have resulted from the combined efforts of educators from both public and private institutions, and from both community colleges and major universities. Accordingly these programs represent and provide the general footing upon which engineering education must be based. The Electrical Engineering program at RIT is sufficiently related to these programs that transfer is possible and encouraged directly into the third year of the RIT curriculum, with a full two years credit granted to the holders of an accredited A.S. degree in Engineering Science.

Electrical Technology Transfer Program (TAS) – In addition to the transfer of students holding the A.S. degree in Engineering Science, the Electrical Engineering Department at RIT has a long and rewarding history of students transferring into Electrical Engineering from the successful completion of A. A.S. programs in Electrical Technology at community colleges. A specialized program for these students is available in our Transfer Adjustment Schedule (TAS) presented on the page immediately following the Five Year Electrical Engineering Program. This program is unique within the State of New York. It provides a clearly defined avenue to the Bachelor of Science degree for holders of the A.A.S. degree in Electrical Technology.

Incoming students are brought to the campus in the Summer (Fourth) Quarter immediately following their A.A.S. program. Here they will be tested diagnostically in mathematics and circuit analysis. Their summer curriculum will then be selected (on the basis of the test results) and assembled from one of the two specialized mathematics courses designed for the program, together with course work in Circuit Analysis, General Studies, and Computers, as required. The objective is to use this initial Summer Quarter to bring the students to the point where the remainder of their Bachelor of Science program can be constructed from existing, regularly schedule Institute courses. Beyond this initial Summer Quarter, the TAS student follows a cooperative work/study plan leading to the Bachelor of Science degree at the end of his third academic year at RIT. Professional and free elective opportunities are also provided in this plan for the expression of individual student interests.

ELECTRICAL ENGINEERING PROGRAM 71

PROGRAM LEADING TO THE B.S. DEGREE
IN ELECTRICAL ENGINEERING

NOTE: F—FALL S-SPRING W—WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
EENG-201, 202 Introduction to Engineering 1, II.....	4	4		FIRST YEAR
SCHG-208, 209 General Chemistry for Engineers 1, 11	4		4	
SMAM-251, 252, 253 Engineering Calculus 1, 11, 111	4	4	4	
SPSG-205, 206 General Physics 1, II		4	4	
• General Studies - Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
EEEE-351 Circuit Analysis 1			4	SECOND YEAR!
EMEM-336, 332 Mechanics 1, II.....	4		4	
SMAM-305 Engineering Calculus IV.....	4			
SMAM-306 Elementary Differential Equations.....		4	4	
SMAM-308 Engineering Mathematics.....			4	
SPSG-207 General Physics III.....	4			
SPSP-314, 315 Introduction to Modern Physics 1, II.....		4	4	
General Studies • Lower Division.....	4	4		
TOSP-220 Advanced Programming Techniques.....		4		
^Physical Education Elective.....	0	0	0	
EEEE-352, 353 Circuit Analysis II, III.....	For W		S or SR	THIRD YEAR
EEEE-430 Linear Systems.....	4		4	
EEEE-441, 442 Electronics 1, II	4		4	
SMAM-351 Probability and Statistics.....			4	
SMAM-420 Complex Variables.....	4			
General Studies - Lower Division	4			
EEEE-531 Energy Conversion.....	4			FOURTH YEAR
EEEE-471, 472 Electric and Magnetic Fields 1, II.....	4		4	
EMEM-431 Thermodynamics.....			4	
EEEE-643 Electronics III.....	4			
EEEE-634 Intro. to Communication Systems.....			4	
EEEE-613 Intro. to Classical Controls.....	4			
General Studies ■ Upper Division			5	
	4		S	FIFTH YEAR
	4		4	
	3-5		3-5	
General Studies - Upper Division	5		5	

• See p. 89 for General Studies requirements.

£>ee p.171 for policy on Physical Education.

(t)Upon successful completion of the second year, the Associate in Applied Science degree is awarded.

TRANSFER ADJUSTMENT SCHEDULE (TAS)
LEADING TO THE B.S. DEGREE IN ELECTRICAL ENGINEERING

NOTE: F—FALL W—WINTER	S-SPRING SR-SUMMER	QUARTER CREDIT HOURS		
		W	SR	
Individualized Program Drawn From Following Courses:				SUMMER PRIOR TO THIRD YEAR
EEEE-351 Circuit Analysis 1.....			4	
SMAM-305 Transfer Mathematics 1			4	
SMAM-300 Transfer Mathematics II.....			8	
• General Studies.....			4-5	
T CSP-220 Advanced Programming Techniques.....			4	
EEEE-352, 353 Circuit Analysis II, III.....		4	4	THIRD YEAR
EEEE-441, 442 Electronics 1, II		4	4	
EMEM-336, 332 Mechanics 1, II.....		4	4	
SMAM-306 Differential Equations.....		4		
SMAM-308 Engineering Mathematics.....			4	
EEEE-430 Linear Systems.....			4	FOURTH YEAR
EEEE-531 Energy Conversion.....		4		
EEEE-471, 472 Electric & Magnetic Fields 1, II		4	4	
SMAM-351 Probability & Statistics.....			4	
SMAM-420 Complex Variables.....		4		
General Studies.....		4-5	4-5	
EMEM-431 Thermodynamics.....			4	FIFTH YEAR
SPSP-314 Modern Physics.....		4		
Professional Elective.....		4	4	
Professional Elective.....		4	4	
Free Elective.....			3-5	
General Studies.....		4-5		

TAS Students have Co-op during Fall and Spring Quarters.

*See p. 89 for the General Studies Requirements.

See p. 171 for policy on Physical Education.

Professional Electives in Electrical Engineering	QUARTER CREDIT HOURS
EEEE-532 Electrical Machines I.....	4
EEEE-590 Thesis.....	4
EEEE-614 Control Synthesis.....	4
EEEE-621 Transmission Propagation and Waves.....	4
EEEE-650 Introduction to Logic and Switching.....	4
EEEE-665 Digital Computer Workshop	4
EEEE-670 Introduction to Microelectronics.....	4
EEEE-671 Hybrid Microelectronics Design	4
EEEE-673 Applied Electronic Design.....	4
EEEE-675 Analog/Hybrid Computation.....	4
EEEE-679 Active and Passive Filters.....	4
EEEE-684 Nonlinear Control Systems.....	4
EEEE-687 Power Systems Analysis.....	4
EEEE-693 Digital Data Communications.....	4
EEEE-695 Introduction to Audio Engineering.....	4
EEEE-696 Communication Circuit Design.....	4

Industrial Engineering Department

RICHARD REEVE, *Head*

Industrial Engineering differs from other branches of the engineering profession in at least two ways. First, it covers most types of industry and commercial activity. Second, it is that major branch of engineering concerned not only with things, but with people as well.

INDUSTRIAL
ENGINEERING

Industrial Engineering has been defined as follows: "Industrial Engineering is concerned with the design, improvement, and installation of integrated systems of men, materials, and equipment. It draws upon specialized knowledge and skill in the mathematical and physical sciences, together with the principles and methods of engineering analysis and design, to specify, predict, and evaluate the results to be obtained from such systems."

Some of the activities of industrial engineers include work measurement, operations research, applied statistics, human factors, plant layout, materials handling, production planning and control, quality control, and management consulting. In recent years, the availability of computers has revolutionized the techniques used by industrial engineers. Entire systems can now be analyzed using simulation and techniques of operations research.

CAREERS

The laboratories at Rochester Institute of Technology are well equipped for teaching in the manufacturing sciences. A well-equipped machine shop and numerically controlled machining center makes it possible to demonstrate current techniques and to conduct student projects. The computing facilities include a newly installed XDS Sigma 6. Students may gain access to the system through remote terminals. Cooperation with the College of Business insures an education well-founded in the techniques of business and management.

Transfer Programs for industrial engineering students are arranged on an individual basis. This allows a student to build an industrial engineering program which best takes into account his previous education and work experience. Students completing an A. A.S. in Engineering Science normally receive credit for the first two years and start their program at RIT with the 3rd year class.

TRANSFER
PROGRAMS

74 INDUSTRIAL ENGINEERING PROGRAM

PROGRAM LEADING TO THE B.S. DEGREE
INDUSTRIAL ENGINEERING

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
EENG-201, 202 Introduction to Engineering 1, II.....	4	4		FIRST YEAR
SCHG-208, 209 General Chemistry for Engineers 1, II.....	4		4	
SMAM-251, 252, 253 Engineering Calculus 1, II, III.....	4	4	4	
SPSG-205, 206 General Physics 1, II.....	4	4	4	
• General Studies • Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
EMEM-336 Mechanics 1 (Statics).....	4		4	SECOND YEART
EMEM-332 Mechanics II (Dynamics).....	4		4	
SMAM-305 Engineering Calculus IV.....	4	4		
SMAM-306 Elementary Differential Equations.....	4		4	
SMAM-308 Engineering Mathematics.....	4		4	
SPSG-207 General Physics III.....	4	4		
EMEM-343 Materials Processing.....	4		4	
EMEM-344 Materials Science.....	4		4	
Science Elective.....	4	4	4	
• General Studies • Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
EIEI-420 Work Measurement & Analysis 1.....	For W		S or SR	THIRD YEAR
EIEI-401 Introduction to Operations Research I.....	4			
EIEI-481 Management Theory & Practice.....	4			
SMAM-351, 352 Introduction to Probability and Statistics.....	4		4	
EIEI-415 Human Factors 1.....	4		4	
EIEI-402 Introduction to Operations Research II.....	4		4	
EIEI-422 Systems & Facilities Planning.....	4		4	
EIEI-510, 511 Applied Statistics 1, 11.....	4		4	FOURTH YEAR
EIEI-520 Engineering Economy.....	4		4	
EIEI-503 Simulation.....	4		4	
EIEI-516 Human Factors II.....	4		4	
• Professional Electives.....	4		4	
• General Studies ■ Upper Division.....			5	
• Professional Electives.....	8		8	FIFTH YEAR
• General Studies ■ Upper Division.....	5		5	
Free Elective.....	4		4	

*See p. 89 for General Studies requirements.

tSee p. 171 for policy on Physical Education.

lUpon successful completion of the second year, the Associate in Applied Science Degree is awarded.

• At least one professional elective must be selected from the following courses: EMEM-431 Thermodynamics; EMEM-415 Fluid Mechanics I; EEEE-461, 462 Electrical Engineering I, II.

Mechanical Engineering Department

ROBERT M. DESMOND, *Head*

Mechanical Engineering is perhaps the most comprehensive of the engineering disciplines, with the mechanical engineer's interests ranging from the design of missile systems to the design of machine tools. The spectrum of professional activity for the mechanical engineering graduate runs from research through development and design to manufacturing and sales. Because of his comprehensive training and his education in the areas of production and economics the mechanical engineer is often called upon to assume management positions.

The first two years of the undergraduate program are devoted to the mastery of mathematics, physics, chemistry, and mechanics — the basic tools of the technologist — and to the thorough grounding in the humanities — the mark of an educated man. The final three years of the program integrate the cooperative work experience with the professional subject matter of the mechanical engineering discipline.

In the fourth and fifth years, the Mechanical Engineering student selects one of three options for intensive study. The three areas include applied mechanics, environmental, and thermal fluid science. Both the applied mechanics and thermal fluid science options offer a core of three courses and a number of additional electives. The environmental program contains four core courses; in these courses problems concerning water, air and solid waste are discussed from a technical and a non-technical point of view.

Students may use their remaining professional and free electives to extend their educational experience in the other options and/or enroll in graduate courses that suit their interest. This flexibility permits each individual to prepare an educational program preparatory for employment or graduate school in his or her specific area of interest.

In addition to the Bachelor of Science and Master of Science degree programs described under the section entitled "College of Engineering", a combined B.S./M.S. degree program is also available for the Mechanical Engineering student. Admission into the program is based on the student's cumulative grade point average, which must be at least 3.0, letters of recommendation from the faculty, and a personal interview by a departmental committee. Application for admission into the program is normally made in the winter quarter of the second year. However, in exceptional cases, admission may be possible as late as the spring quarter of the third year. The student who is admitted into the program in his second year is expected to start his cooperative work experience in the summer quarter of that year. All students in the program are required to *maintain* a cumulative grade point average of at least 3.0. Further information regarding this program can be obtained from the Department of Mechanical Engineering.

CAREER
OBJECTIVES

COMBINED
FIVE-YEAR
B.S./M.S.
DEGREE
PROGRAM

The Mechanical Engineering Department is staffed to offer professional courses in the areas of thermal systems, applied mechanics, manufacturing, environmental science, systems analysis, and materials science. The laboratories of the department are equipped to provide extensive experimentation in these areas and students are encouraged to pursue independent research in addition to that required in their programs.

TRANSFER
PROGRAMS

An increasing number of students choose to pursue their studies leading to the Bachelor of Science degree in Mechanical Engineering by first completing the two-year Associate in Applied Science program at a community college or technical college, often within commuting distance of their homes. Many will anticipate transfer to an engineering college and will pursue the Engineering Science program which represents the equivalent of the first two years in the average four-year engineering program. Others, for various reasons, will elect to follow a Mechanical Technology program for the first two years.

The Mechanical Engineering Department at RIT has a long-standing tradition of admitting graduates from these two-year programs and very quickly integrating them into the B.S. program in Engineering. The addition of these transfer students in significant numbers to our regular undergraduate students has provided an added dimension and a uniqueness to the RIT engineering program.

The A.A.S. graduate in Engineering Science with above average scholastic achievement can generally anticipate entering the B.S. program in Mechanical Engineering as a regular third-year student. In a few cases it may be necessary to alter one or two courses in the program to accommodate differences in the programs of preparation in the first two years. However, these changes are generally minor.

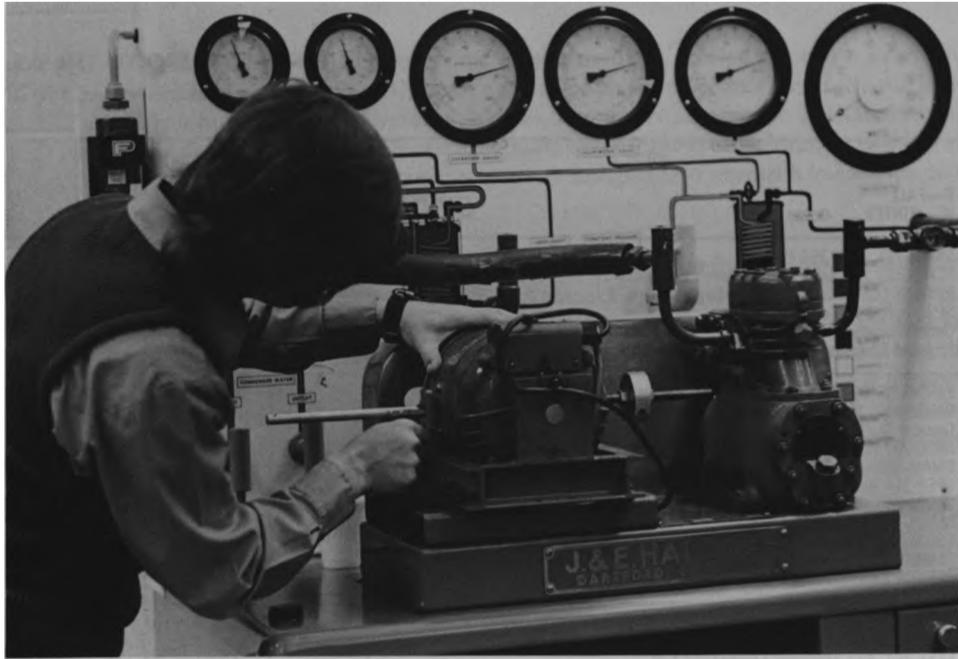
The A.A.S. graduate in Mechanical Technology with superior academic achievement should seriously consider transfer to a B.S. program in Mechanical Engineering as one alternative for continuing formal education. Because the basic philosophy underlying the technology programs and the engineering programs are significantly different, the A.A.S. graduate in technology requires a somewhat special program to adapt his previous educational experience to the B.S. program in Engineering. Recognizing that no single program of study can effectively integrate all mechanical technology graduates into the engineering curriculum, each qualified transfer applicant is given a program of study that best meets his career goals, satisfies the basic accrediting requirements for the B.S. degree, provides a meaningful cooperative work experience, and permits the student to fulfill the degree requirements in a reasonable period of time.

A transfer student who has completed the winter quarter at RIT and who achieved a cumulative grade point average of at least 3.0 may apply for admission into the five-year combined B.S./M.S. degree program.

PROGRAM LEADING TO THE B.S. DEGREE
MECHANICAL ENGINEERING

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
SMAM-251, 252, 253 Calculus.....	4	4	4	FIRST YEAR
SCHG-208, 209 General Chemistry for Engineers.....	4		4	
EENG-201, 202 Introduction to Engineering 1, II.....	4	4		
SPSG-205, 206 General Physics.....		4	4	
• General Studies - Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
EM EM-336 Statics.....	4			SECOND YEART
EMEM-337, 338 Strength of Materials 1, II.....		4	4	
General Studies - Lower Division.....	4		4	
SPSG-207 General Physics III.....	4			
SMAM-305 Calculus.....	4			
SPSP-314 Modern Physics.....		4		
EMEM-343 Materials Processing.....		4		
SMAM-306 Differential Equations.....		4		
EMEM-344 Materials Science.....			4	
SMAM-308 Engineering Mathematics.....			4	
^Physical Education Elective.....	0	0	0	
EMEM-413, 414 Thermodynamics 1, II.....	For W		S or SR	THIRD YEAR
EEEE-461, 462 Electrical Engineering 1, II.....	4		4	
EMEM-532 Introduction to Machine Design.....	4			
EMEM-439 Dynamics.....			4	
EMEM-415 Fluid Mechanics I.....			4	
General Studies - Lower Division.....	4			
OPTIONS A, B or C				FOURTH YEAR
EMEM-514 Heat Transfer.....	4			
EMEM-401 Mechanical Engineering Lab 1.....	4			
EMEM-678 Mechanical Vibrations ¹	4			
EMEM-661 Fluid Mechanics II.....			4	
EMEM-440 Mechanical Systems Analysis.....			4	
General Studies - Upper Division.....	5		5	
Mechanical Engineering Option, A, B, or C.....			4	
OPTIONS A & B	For W		S	FIFTH YEAR
Professional Electives.....	4		4	
General Studies - Upper Division.....			5	
Mechanical Engineering Option A or B.....	4		4	
Free Elective.....	4		4	
EMEM-502 Mechanical Engineering Lab II.....	4			
OPTION C				
Professional Elective.....			4	
General Studies - Upper Division.....			5	
Mechanical Engineering Option C.....	8		4	
Free Elective.....	4		4	
EMEM-502 Mechanical Engineering Lab II.....	4			

• See p. 89 for the General Studies Requirements.
 tUpon successful completion of the second year, the Associate in Applied Science degree is awarded.
 • Successful completion of this course is required to enter Option A.
 tSee p.171 for policy on Physical Education.



Mechanical Engineering Options (4 Credits each)

OPTION A—Applied Mechanics

- Required courses: EMEM-694 Stress Analysis I
EMEM-672 Selected Machine Elements
EMEM-632 Advanced Mechanical Systems Design
- Electives: EMEM-670 Thermal Stresses
EMEM-675 Probabilistic Approach to Design
EMEM-676 Kinematic Analysis of Mechanisms
EMEM-684 Advanced Dynamics
EMEM-685 Advanced Strength of Materials
EMEM-697 Stress Analysis II

OPTION B—Thermal Fluid Science

- Required courses: EMEM-535 Industrial Heat Transfer
EMEM-660 Refrigeration and Air Conditioning
EMEM-652 Fluid Mechanics of Turbomachinery
- Electives: EMEM-650 Gas Dynamics
EMEM-615 Viscous Flow
EMEM-677 Modern Energy Conversion
EMEM-680 Advanced Thermodynamics
EMEM-683 Statistical Thermodynamics
EMEM-696 Nuclear Power

OPTION C—Environmental

- Required courses: EMEM-667 Introduction to Air Pollution
EMEM-668 Environmental Engineering Laboratory and Project
EMEM-669 Introduction to Water Pollution
EMEM-695 Solid Waste Management
- Electives: EMEM-664 Engineering Acoustics and Noise Control
EMEM-679 Mechanical Systems Analysis II
EMEM-689 Patent Law and Protection
EMEM-690 Environment and the Engineer



College of Fine and Applied Arts

College of Fine and Applied Arts

ROBERT H. JOHNSTON, *Dean*

The College of Fine and Applied Arts offers programs in the arts and crafts through curricula in the School of Art and Design and the School for American Craftsmen. Concentrations, or majors, in the School of Art and Design are given in Communication Design, Industrial/Environmental Design, Painting and Printmaking. In the School for American Craftsmen concentrations are given in Ceramics and Ceramic Sculpture, Glassblowing, Metalcrafts and Jewelry, Weaving and Textile Design, and Woodworking and Furniture Design.

The studies in the two Schools of the College express a common educational ideal: the conviction that technical competence provides the most satisfactory foundation for the expression of creative invention. However, the mastery of techniques is seen as a means, not an end; the end of education in the arts is the exercise of creative imagination.

RESOURCES

The equipment and studios of the School of Art and Design are superior in every respect. A comprehensive art library of source material and an outstanding collection of slides are available for reference; and the latest instructional films and other visual aids are utilized. Exhibitions, held in the Bevier Gallery, feature the work of contemporary painters, designers, and graphic artists, as well as work by faculty and students. The Rochester Society for the Communication Arts maintains a close relationship with the school, sponsoring a yearly student project. Professional designers, photographers, and graphic arts personalities are invited to lecture and give demonstrations. Rochester industry and commerce often sponsor pilot programs which are carried on under faculty supervision.

An added resource is the community of Rochester itself, with its many opportunities for educational, cultural, and social enrichment. Exhibitions, programs in the performing arts, and lectures are available to provide extracurricular learning for the interested student.

The resources of the School for American Craftsmen available for the student are exceptional: excellent equipment and facilities and a unique and challenging program combining learning and doing.

The faculty in the College of Fine and Applied Arts are productive in the fields in which they teach, and the honors and prizes they have won are a reflection of the prestige they enjoy as artists and craftsmen. They have been broadly trained in Europe and the United States, and are well acquainted with contemporary practice in their art or craft. While the teaching staff is composed of professional artists and craftsmen, able to practice their art or craft with distinction, they are, as well, interested and sympathetic teachers and counselors.

The RIT Library is particularly strong in the extensive list of contemporary periodicals in the arts and crafts available for study and research.

ACCREDITATION

The programs of study offered in the College of Fine and Applied Arts are fully accredited: courses of study have been approved by the New York State Department of Education, the Middle States Association of Colleges and Secondary Schools, and the National Association of Schools of Art. The College is a member institution of the National Association of Schools of Art.

PLAN OF
EDUCATION

The programs in the College of Fine and Applied Arts are two and four years in length and lead to the Associate in Applied Science and the Bachelor of Fine Arts degrees. Students attend school for three quarters, each 12 weeks in length, during the school year. Advanced study at the graduate level is offered which leads to the Master of Fine Arts and the Master of Science in Teaching degrees. The former may be earned normally in two years, the latter in one. Both graduate degrees may be earned in programs carried during the regular school year, in a series of summer sessions, or a combination of regular and summer studies.

Among the programs offered for the Master of Science in Teaching degree is a concentration in Art Education designed for those holding the Bachelor of Fine Arts degree (or a Bachelor of Arts degree with an art major) which leads to the graduate degree and certification to teach in the public schools of the State of New York.

Those interested in graduate study should request a copy of the Graduate Bulletin, which describes the degrees offered, the programs of study, and the procedures governing admission.

Professional Approach — Educational programs in the College of Fine and Applied Arts are related to the kinds of art services which the society needs, and based on teaching projects which can be made realistic and meaningful to the student. The problems duplicate, as far as possible, those found in the working situation after graduation. The courses are full-time, instruction is largely on an individual basis, and full opportunity is given for personal development. Exhibitions, lectures, and field trips add breadth and variety to the formal programs of study.

A unique feature of the educational programs offered in the College of Fine and Applied Arts is its emphasis on the professional approach to the understanding and solution of problems. Instructional services provided by a professionally experienced and oriented faculty, plus the well-equipped shops and studios designed with the needs of professional artists or craftsmen in mind, further emphasize the practical character of the program of instruction.

Students are asked to demonstrate a professional attitude and purpose: to apply themselves to the requirements of the program, to cooperate in the fulfillment of its goals, and to assume some responsibility for their educational development through independent work.

Inter-relation with other RIT Schools — Educational facilities of a rare sort in the arts are available to the student in the School of Art and Design: the superior resources of the School of Photographic Arts and Sciences, and the School of Printing. A program of instruction which emphasizes production, as well as design of the crafts, gives a unique character to the educational program in the School for American Craftsmen.

The School of Art and Design, in addition to its major concentrations, gives the courses in drawing, design, and art electives required in the curricula in the School for American Craftsmen. Students in the School of Art and Design may elect, with permission, and as space is available, courses in the School for American Craftsmen that are related to their programs of study, or interests.

In the College of Fine and Applied Arts the Schools so use their facilities as to broaden and deepen the art interests of the students in both. Seminars, lectures, exhibitions, and motion pictures draw the students in the College together by providing stimulating experiences that serve to indicate that the arts have a common character as well as a divergence of aim and service. Purely social activities, as well as educational ones, also serve to unify the interests of the students in the two schools.

82 FINE AND APPLIED ARTS

TRANSFER PROGRAM

The College of Fine and Applied Arts offers a summer transfer program for Art majors. Successful completion of this program qualifies students for second year standing in the following options: Communication Design, Industrial/Environmental Design, Painting or Printmaking. Designed especially, though not exclusively, for graduates of community colleges, this transfer program is open to students with:

1. Good academic standing at another college;
2. One or two years of college, with a heavy emphasis in studio art (minimum of 12 semester or 18 quarter credit hours);
3. Presentation of an acceptable art portfolio demonstrating strength in one or more areas.

SUMMER SESSION

The College of Fine and Applied Arts offers a program of summer studies in both the School of Art and Design and the School for American Craftsmen that are arranged for designers, teachers, and craftsmen. Both basic and advanced workshops are given, as well as graduate courses. Those interested should write the Director of the Summer Session for information.

JUNIOR YEAR ABROAD

The School for American Craftsmen, in cooperation with the Scandinavian Seminars, offers a Junior Year Abroad in the field of the crafts. This permits certain well-qualified students to spend their third year of study in one of the Scandinavian countries, after which they return for a fourth year of study at RIT. Full credit for the year of satisfactory study overseas will be granted toward the B.F.A. degree. Information on the Junior Year Abroad program can be obtained by writing the Dean, College of Fine and Applied Arts.

POLICY REGARDING STUDENT WORK

The College of Fine and Applied Arts reserves the right to retain student work for educational use or exhibition for a period of time not to exceed one and one-half quarters beyond the year the object has been made. The College also reserves the right to select an example or examples for its permanent collection. In such cases, where work is selected for the permanent collection the material cost only will be paid by the College. It is an honor to have one's work in the permanent collection of the College of Fine and Applied Arts.

ATTENDANCE REGULATIONS

The programs of the College utilize the studios and shop experiences as an essential part of the educational program; therefore it is imperative that the student regularly attend all classes unless specifically excused for special projects or activities by the instructors. Failure to attend classes, and to complete assignments, will be taken into consideration in grading.

School of Art and Design

FREDERICK LIPP, *Chairman, Foundation Studies*

PHILIP BORNARTH, *Chairman, Fine Arts*

ROGER REMINGTON, *Chairman, Communication Design*

CRAIG McART, *Chairman, Industrial/Environmental Design*

FRED MEYER, *Chairman, Graduate Studies*

The objectives of the programs are to prepare students for a wide variety of positions in which art is related to commerce and industry. Students are prepared to accept major responsibility for the design and execution of projects in Communication Design and Industrial/Environmental Design.

The educational objectives of the School of Art and Design are: (1) to encourage imagination, creative ability, and a sense of artistic discrimination; (2) to develop the skills essential to professional competence; (3) to relate the various arts and to assist the student in finding the means to enjoy them; (4) to cooperate with the College of General Studies in helping the student grow culturally and socially, and to inspire him to make his maximum contribution as a creative artist and a citizen.

Major concentrations are offered in Communication Design, Industrial/Environmental Design and the Fine Arts. Electives may be pursued, beginning in the second year in Painting, Printmaking, Design Applications, Communication Design and the Crafts. The first year forms the foundation preparation for the major concentration, with courses required in Drawing and Two- and Three-Dimensional Design. The Communication designer is in the service of ideas and humanity. He has the abilities and competence needed for effectively planning, imparting and interchanging thoughts, concepts, opinions, and information. He is an inventive and creative member of problem-solving teams in the contemporary world of business, industry, agriculture, government, education, and religion. The program in Industrial/Environmental Design prepares students to design effectively for the social, industrial, and environmental condition. The curriculum concerns itself with the preparation for future forecasting, with an emphasis upon the humanistic and larger environment.

The Fine Arts specifically serve the student who is interested in concentrated study in areas of Printmaking or Painting and electives of additional art choices. Students emerging from this program are prepared as professional artists and have exploratory potentialities for later careers in teaching.

Program Outline

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
FADF-230, 231, 232 Two-Dimensional Design.....	3	3	3	FIRST YEAR
FADF-240, 241, 242 Three-Dimensional Design.....	3	3	3	
FADF-205, 206, 207 Creative Sources.....	2	2	2	
FADF-210, 211, 212 Drawing.....	4	4	4	
*General Studies - Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
FSCF-225, 226, 227 Art and Civilization.....	3	3	3	SECOND YEAR
*General Studies - Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
•••ELECTIVES (THREE) 3 Credits each per Quarter				
•••FADC-301, 302, 303 Communication Design.....				
•••FADE-301, 302, 303 Industrial/Environmental Design.....				
•••FADP-301, 302, 303 Advanced Drawing.....				
FADS-411, 412, 413 Sculpture.....	9	9	9	
FADE-411, 412, 413 Design Applications.....				
PPRT-201, 202, 203 Typographic Composition.....				
PPHG-207, 208, 209 Still Photography.....				
PPHF-207, 208 Introduction to Filmmaking.....				
PPHF-209 Introduction to TV.....				
FSCF-325, 326 American Art.....	3	3		THIRD YEAR
FSCF-327 Contemporary Tendencies in Art.....			3	
*General Studies - Upper Division.....	5	5	5	
MAJOR (ONE)				
FADR-401, 402, 403 Printmaking.....				
FADP-401, 402, 403 Drawing and Painting.....	6	6	6	
FADC-401, 402, 403 Communication Design.....				
FADE-401, 402, 403 Industrial/Environmental Design.....				
*ELECTIVES (ONE)				
FADR-411, 412, 413 Printmaking.....				
FADP-411, 412, 413 Drawing and Painting.....				
FADC-411, 412, 413 Communication Design.....				
FADE-411, 412, 413 Design Applications.....	3	3	3	
FSCC-251, 252, 253 Ceramics I.....				
FSCM-251, 252, 253 Metalcrafts I.....				
FSCF-251, 252, 253 Textiles I.....				
FSCW-251, 252, 253 Woodworking I.....				
*General Studies - Upper Division.....	5	5	5	FOURTH YEAR
MAJOR (ONE)				
FADR-501, 502, 503 Printmaking.....				
FADP-501, 502, 503 Painting.....	9	9	9	
FADC-501, 502, 503 Communication Design.....				
FADE-501, 502, 503 Industrial/Environmental Design.....				
*ELECTIVES (ONE)				
FADR-511, 512, 513 Printmaking.....				
FADP-511, 512, 513 Painting.....				
FADC-511, 512, 513 Communication Design.....				
FADE-511, 512, 513 Design Applications.....	3	3	3	
FSCC-251, 252, 253 Ceramics II.....				
FSCM-251, 252, 253 Metalcrafts II.....				
FSCF-251, 252, 253 Textiles II.....				
FSCW-251, 252, 253 Woodworking II.....				

†Upon completion of the second year, the Associate in Applied Science degree is awarded.

*See p. 89 for General Studies requirements.

†Sep. 171 for policy on Physical Education.

- Additional intercollege studio courses are available by recommendation of the academic advisor and Assistant Dean. Electives are registered on a space available basis and subject to change without prior notice. Some electives are sequential. Consult the advisor when planning programs.
- Core Electives—Introductory courses that are prerequisite to the respective 3rd year Major. FADC-301,302,303 required for entrance into Communication Design Major; FADE-301,302,303 for Industrial/Environmental Design Major; FADP-301,302,303 for Printmaking and Painting Major. However, all three Core Electives are available as elective choices.

School for American Craftsmen

DR. ROBERT JOHNSTON, *Director*

The objectives of the programs of study of the School for American Craftsmen are to provide for creative growth, the development of professional competence, and intellectual and cultural enrichment. Students who complete the two-year program are prepared for work in the design studios and workshops of established craftsmen, or as technicians in industry. Those who complete the four-year course of study are prepared for careers as self-employed designer-craftsmen, as designers or technicians in industry, or as teachers or administrators of crafts programs.

OBJECTIVES

In order to achieve the desired occupational goals, the educational objectives seek:

1. To stimulate creative imagination and technical invention.
2. To develop knowledge of process and command of necessary skills.
3. To foster appreciation, not only of the crafts, but the related arts.
4. To inspire the student to seek continual improvement through analysis and self-evaluation.
5. To cooperate with the College of General Studies in assisting students to develop personally and socially in order that they may live usefully as creative artists and citizens.

Students are responsible for the care and cleanliness of their shops and for the care and maintenance of the tools and machines with which they work. No student may use any machine until he has received instruction in its proper use, and responsibility for observing safety precautions is assumed by each student upon entering the School.

STUDENT RESPONSIBILITIES

The School for American Craftsmen offers a full-time program of study with opportunity for concentration in one of five craft fields: Ceramics, Metalcrafts and Jewelry, Weaving and Textile Design, Woodworking and Furniture Design and Glassblowing. After satisfactory completion of two years of study the Associate in Applied Science degree is granted. Those with the aptitude and interest for further study may continue for two additional years. After successful completion of the four-year program the Bachelor of Fine Arts degree is awarded.

PROGRAMS OF STUDY

Program Outline

CRAFTS MAJORS

NOTE:	QUARTER CREDIT HOURS					
	F-FALL W-WINTER	S-SPRING SR-SUMMER	FWS			
	FADF-201, 202, 203 Design.....		4	4	4	FIRST YEAR
	FADF-205, 206, 207 Creative Sources.....		2	2	2	
	FADF-261, 262, 263 Drawing.....		2	2	2	
	ttFSCW-241, 242, 243 Mechanical Drawing.....		1	1	1	
	• General Studies Electives - Lower Division.....		4	4	4	
	MATERIALS AND PROCESSES (ONE)					
	FSCG-200, Ceramics.....					
	FSCG-200, Glassblowing.....					
	FSCM-200, Metalcrafts.....		5	5	5	
	FSCW-200, Woodworking.....					
	^Physical Education Elective.....		0	0	0	
	FSCF-225, 226, 227 Art and Civilization.....		3	3	3	SECOND YEARf
	♦General Studies Electives ■ Lower Division.....		4	4	4	
	MATERIALS AND PROCESSES (ONE)					
	FSCC-300, Ceramics.....					
	FSCG-300, Glassblowing.....					
	FSCM-300, Metalcrafts.....		5	5	5	
	FSCW-300, Woodworking.....					
	ELECTIVES (ONE)					
	FADE-411, 412, 413 Design Applications.....					
	FADS-411, 412, 413 Sculpture.....					
	PPHG-207, 208, 209 Still Photography.....					
	FSCC-251, 252, 253 Ceramics 1.....		3	3	3	
	FSCM-251, 252, 253 Metalcrafts 1.....					
	FSCW-251, 252, 253 Woodworking 1.....					
	FSCG-251, 252, 253 Glassblowing 1.....					
	^Physical Education Elective.....		0	0	0	
	FSCF-325, 326 American Art.....		3	3	3	THIRD YEAR
	FSCF-327 Contemporary Tendencies in Art.....					
	• General Studies Electives - Upper Division.....		5	5	5	
	MATERIALS AND PROCESSES (ONE)					
	FSCC-400 Ceramics.....					
	FSCG-400 Glassblowing.....					
	FSCM-400 Metalcrafts.....		5	5	5	
	FSCW-400 Woodworking.....					
	• • ELECTIVES (ONE)					
	FADR-411, 412, 413 Printmaking.....					
	FADP-411, 412, 413 Drawing and Painting.....					
	FADC-411, 412, 413 Communication Design.....					
	FADE-411, 412, 413 Design Applications.....					
	FADS-411, 412, 413 Sculpture.....		3	3	3	
	FSCC-251, 252, 253 Ceramics 1.....					
	FSCM-251, 252, 253 Metalcrafts 1.....					
	FSCW-251, 252, 253 Woodworking 1.....					
	FSCG-251, 252, 253 Glassblowing 1.....					

CRAFTS PROGRAM

	F	W	S	
• General Studies Electives - Upper Division.....	5	5	5	FOURTH YEAR
TECHNIQUES AND THESIS (ONE)				
FSCC-500 Ceramics				
FSCG-500 Glassblowing				
FSCM-500 Metalcrafts	8	8	8	
FSCF-500 Textiles.....				
FSCW-500 Woodworking.....				
• ELECTIVES (ONE)				
FADR-511, 512, 513 Printmaking.....				
FADP-511, 512, 513 Drawing and Painting				
FADC-511, 512, 513 Communication Design				
FADE-511, 512, 513 Design Applications.....				
FADS-411, 412, 413 Sculpture.....	3	3	3	
FSCC-251, 252, 253 Ceramics 1				
FSCM-251, 252, 253 Metalcrafts 1.....				
FSCF-251, 252, 253 Textiles 1				
FSCW-251, 252, 253 Woodworking 1				
FSCG-251, 252, 253 Glassblowing 1.....				

{*Woodworking and Furniture Design only.

fUpon satisfactory completion of the second year, the Associate in Applied Science degree is granted.

• See p. 89 for General Studies requirements.

JSee p. 171 for policy on Physical Education.

• Additional intercollege studio courses are available by recommendation of the academic advisor and Assistant Dean. Electives are registered on a space available basis and subject to change without prior notice. Some electives are sequential. Consult the advisor when planning programs.



College of General Studies

PAUL BERNSTEIN, *Dean*

PHILOSOPHY AND OBJECTIVES

General education at RIT means more than a listing of required courses. It seeks to foster in each student an adequate philosophy and a way of life consistent with it. Its purpose is to draw out the talent of young people and give them the opportunity to mature intellectually, aesthetically, socially, and morally. The courses in General Studies are designed to help the student understand humanistic concerns, the physical universe, and human society. Their purpose is to stimulate curiosity, to encourage independent study, and to enable the student to see how different areas of knowledge are related.

It is hoped that these activities will help the student make progress in a career, develop effective human relationships, and make intelligent and constructive use of his potentialities.

More specifically, it is hoped that the following can be done in association with the student:

1. To provide a wider acquaintance with man's historical and cultural heritage.
2. To provide awareness of alternative perspectives as a basis for more intelligent and responsible choice of values and attitudes.
3. To provide opportunity for development of appropriate habits of thought in many fields so that he has a basis for continuing self-education.
4. To promote a vigorous intellectual independence.
5. To provide training in those intellectual techniques which are useful for the clear statement and comprehension of ideas.
6. To promote understanding of and respect for areas of human knowledge and investigation that complement and extend his professional studies.

PLAN OF EDUCATION The courses of the College of General Studies are available to students registered in one of the colleges of the Institute.* The basic curriculum of the College requires the student to take 24 quarter credit hours of lower division core courses followed by 30 quarter credit hours of upper division electives. Because of particular needs or requirements, some exceptions to this basic curriculum may be found. The program outlines of each school or department list the General Studies requirements by year of study.

During the first two years the student will take six four-credit-hour courses which will involve him in basic studies in language, literature, history, the behavioral sciences, and critical approaches to art or science.

During the final two years the student will have the opportunity to deepen his knowledge in areas of particular interest to him. He will elect six five-credit-hour courses from a broad range of possibilities in three discipline areas—Language and Literature, Science and Humanities, and Social Science.

***Degree programs in Social Work and Criminal Justice are available to students through the College of General Studies, and are described on later pages of this section.**

It should be noted that all lower division courses carry four quarter hours of credit and all upper division courses carry five quarter hours of credit. Further, all courses in the lower division and upper division meet three scheduled class hours each week. The discrepancy between credit hours and class hours is offset by carefully planned and extensive out-of-class assignments and projects. The purpose of this plan is to provide the student with opportunities for extended responsibility beyond those normally found in a regular class situation.

The College of General Studies will accept special students who are not currently degree candidates. Individual programs will be developed for each student.

Diploma courses will not normally be counted toward the completion of a degree in Social Work or Criminal Justice, and cannot normally be used toward the completion of General Studies requirements.

CURRICULUM – COLLEGE OF GENERAL STUDIES

LANGUAGE AND LITERATURE AREA	SOCIAL SCIENCE AREA	SCIENCE AND HUMANITIES AREA
Disciplines:	Disciplines:	Disciplines:
Language (Prefix GLLC)	Anthropology (Prefix GSSA)	Fine Arts (Prefix GSHP)
Literature (Prefix GLLL)	Economics (Prefix GSSE)	History (Prefix GSHH)
	Political Science (Prefix GSSM)	Natural Science (Prefix GSHN)
	Psychology (Prefix GSSP)	Philosophy (Prefix GSHP)
	Sociology (Prefix GSSS)	

LOWER DIVISION REQUIREMENT:

Students **MUST** have two courses from each area: Language and Literature, Social Science, Science and Humanities.

Students may *not* repeat a discipline: even though the courses in a particular discipline are quite different, only *one* course in, for instance, *Psychology* may be taken to meet Lower Division requirements.

Each quarter students should contact their advisor for the choice of electives, which may be restricted to a given area: Language and Literature, Social Science, Science and Humanities.

UPPER DIVISION REQUIREMENT:

Students may select any six courses at the Upper Division level.

90 GENERAL STUDIES RESOURCES

FACULTY

The faculty of the College of General Studies is selected from candidates with advanced study in the social sciences and humanities. These men and women are dedicated teachers who have chosen as their professional goals continuing growth in their scholarly fields and provision for rich and meaningful learning experiences for the student.

RESOURCES

The College is fortunate in having a wide variety of resources both within the Institute and in the community. At RIT the Bevier Art Gallery, the Institute Library, and an extensive record collection are supplemented by audio-visual material and visiting discussion leaders.

Community resources include the Rochester Public Library, and the libraries of several local companies. The Librarian of RIT will arrange interlibrary loans with State or company libraries upon request. Advantage is also taken of such other resources as the George Eastman House of Photography, the Rochester Museum of Arts and Sciences, the Memorial Art Gallery, Kilbourn Hall, and the Eastman Theatre.

SUMMER SESSION
PHILOSOPHY AND
OBJECTIVES

Under the auspices of the Institute Summer Session, the College of General Studies, upon sufficient demand, offers a number of courses in Language and Literature, Science and Humanities, and Social Science. Information concerning courses to be offered can be obtained by contacting the Director, Summer Session.



program Leading to the B.S. Degree in Criminal Justice

JOHN O. BALLARD, *Acting Director*

As part of its continuing tradition of community service, Rochester Institute of Philosophy and Technology has initiated a new baccalaureate program in Criminal Justice. It is conceived as a program to educate police, correction, probation, customs, immigration, and narcotics officers as well as police-community liaison personnel, federal and state revenue control officers, federal claims examiners, park rangers, personnel for criminal justice planning agencies, personnel for industrial and institutional security, and staff for research into various aspects of the criminal justice system. The President's Commission on Law Enforcement and the Administration of Justice has strongly indicated the need for such personnel and has urged that special attention be given to candidates from minority groups.

The program is designed to articulate with offerings from community colleges, and thus offer course work in the area of criminal justice at the junior-senior level. The program also provides educational opportunities for students who wish to qualify for eventual graduate work in criminal justice.

The curriculum leading to the baccalaureate degree in Criminal Justice rests on the following general areas of content:

1. In all areas of the criminal justice system the curriculum will stress skills, experiences, and insights that will help in the prevention of crime, the administration of justice to suspects and those convicted by the courts, and the rehabilitation of those who are convicted.
2. Emphasis will be placed on the understanding of the goals and operation of various agencies in the criminal justice system as well as to suggest possible changes in goals or operations that might improve the total system in terms of efficiency and justice. The interdependence of the various agencies of the total system will be stressed.
3. The program will help students to understand the purposes and content of criminal law, and explore alternative methods of social control for particular behavioral problems other than the criminal sanction.
4. The program will address itself to a careful analysis of the urban context in which many peace officers function, in which most crimes occur, and from which many inmates come. Course work and field experience will also be devoted to methods that will help offenders achieve resocialization and reintegration into the mainstream of the community.
5. Through its emphasis on the behavioral sciences, the curriculum will help graduates cope with the problem of handling people with abnormal behavior patterns as well as adolescents and young people who have developed a pattern of distrust relative to the police.

6. Students can also acquire skills in group work so that they can relate to the numerous familial problems encountered in police work. This can be done through established courses and field experiences as offered by our Social Work staff.
7. This program can assist the law enforcement officer who must fit into an increasingly sophisticated milieu which requires expertise in investigation, electronic data processing, crime reporting, communication within the criminal justice system, the scientific evaluation of evidence, and the ability to interpret, evaluate, and improve the collection of crime data. Whether one is speaking of pre-service or in-service students, the baccalaureate program in Criminal Justice should and will provide the graduate with a greater in-depth understanding of himself as a human being acting in a professional role, of the social community and its crime-related problems, and of the goals and means of the criminal justice system.
8. And finally, the program will explore the nature of change and methodologies for designing and implementing desirable changes in the policies and functioning of institutions in the criminal justice system. Course work in statistics, computer technology, and methodology will be available for students who wish to qualify for research.

There are increasing numbers of professionally recognized career opportunities for the B.S. degree graduate of a program in Criminal Justice. Typical are the following:

Federal Law Enforcement Agencies	Halfway Houses
State Law Enforcement Agencies	Probation
Municipal Law Enforcement Agencies	Parole
City/County Law Enforcement Agencies	Courts
Correctional Institutions	Security – Private/Industrial

TRANSFERABILITY

Blanket credit for the first two years is offered for an A.A.S. degree in an appropriate major. Holders of Liberal Arts or other two-year degrees will be granted credit for the first two years except for required professional courses.

All transfer students must, however, demonstrate competency in professional courses required in the first and second years, or must take these courses in place of professional electives or in addition to stated curriculum. Field placement for qualified transfer students will begin in the Fall Quarter of their Senior year, rather than the Winter Quarter of their Junior year.

Program Outline

criminal justice

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
GCJC-203 Introduction to Criminology.....	4			FIRST YEAR
GCJC-201 Fundamentals of the Criminal Justice System.....		4		
GCJC-204 Introduction to Public Administration.....		4		
GCJC-202 Etiology of Crime.....			4	
GSSS-201 Fundamentals of Sociology.....	4			
GSSP-210 Introduction to Psychology.....		4		
♦Other General Studies (Electives) - Lower Division.....	8	4	8	
Open Elective.....			4	
(Physical Education Elective.....)	0	0	0	
GCJC-301 Fundamental Concepts & Patterns of Criminal Law.....	4			SECOND YEAR
GCJC-302 History of Organized Crime.....	4			
GCJC-303 Law Enforcement and Society: The Police Function.....		4		
GCJC-304 The Judicial Process.....			4	
GSSP-203 The Psychology of Childhood and Adolescence.....		4		
GSSP-503 The Abnormal Personality.....			5	
GSSS-505 Juvenile Delinquency.....			5	
Science Elective (College of Science) ¹	4	4		
•Other General Studies (Electives) - Lower Division.....	4	4	4	
(Physical Education Elective.....)	0	0	0	
GCJC-406 Correctional Institutions.....	4			THIRD YEAR
GCJC-401 Scientific Methodology.....	4			
•General Studies Elective - Upper Division.....	5			
Professional Elective.....	4			
GCJC-403, 404 Field Experience and Seminar ²		9	9	
GCJC-511 Alternatives to Incarceration.....	4			FOURTH YEAR
GCJC-503 Reform and Renewal of Social Institutions.....		4		
GSSS-510 Social Psychology.....	5			
Professional Elective.....	4	4	4	
•Other General Studies Electives - Upper Division.....	5	10	10	
Open Elective.....			4	

* See p. 89 for the General Studies Requirements. Students in Criminal Justice have two additional Lower Division required courses, which may be chosen from any of the three General Studies Areas listed.

>A Computer Science course sequence may be taken in place of the Science Elective.

²In-service students with two years full-time employed experience in the criminal justice system will not pursue Field Experience. In its place, the student will be required to take at least two Professional Electives per quarter equivalent in credit to the Field Experience courses.

^tSee p. 171 for policy on Physical Education.

Program Leading to a B.S. Degree in Social Work

LEONARD GRAVITZ, *Director*

PHILOSOPHY AND OBJECTIVES Since its inception in 1829, Rochester Institute of Technology has had a long tradition of community service. Its new program in Social Work is the latest response to the needs of urban communities, and is viewed as a continuing step in RIT's urban commitment. It is conceived as a broad generic major to prepare baccalaureate-level social workers and is designed to respond to the trend in the profession toward a wider variety of social work practice roles. This trend has received wide support among social work employers, and the National Association of Social Workers and the Council on Social Work Education have officially supported the development of baccalaureate professional curricula. The Bachelor of Science degree program is the initial entry into the field of social work, and may also prepare students who wish to continue their professional education on the graduate level.

TRANSFER STUDENTS Blanket credit for the first two years is offered for an A. A. or A. A.S. degree. RIT has long maintained a close relationship with community and two-year colleges in curriculum articulation.

CURRICULUM The curriculum leading to the baccalaureate degree in Social Work rests on the following general areas of content:

1. A Continuum of Social Welfare Courses

This would include articulated material on social welfare as a modern social institution, the origins of social welfare, sources of social conflict, the involvement of government in social welfare, decision-making, economic factors involving poverty, employment levels, guaranteed annual income, and the democratic-humanitarian values of our society as these may emerge in social welfare practice.

In addition, content on the characteristics and attributes of social work as a profession will be closely examined. The varying roles of the social worker including his relationship to clients and agencies will be studied, as well as the various philosophical and ethical bases of action, the motivation required for effective delivery of service, career opportunities, organizational settings, group identification, and such issues as bureaucracy versus individualism.

Further, a generic methods course will be offered before and concurrently along with field instruction. Emphasis will be placed on the differential use of common principles in a diversity of situations suggesting social work intervention.

And, finally, a senior project and seminar will give the student an opportunity to study a particular aspect of social welfare practice, and in doing this, reflect on his social work study and experience, and focus on future professional and humanitarian goals.

2. A Broad Spectrum of Foundation Courses in the Social Sciences and Humanities

Through these liberal opportunities it is hoped to assist students in their intellectual, aesthetic, and social development, stimulate their curiosity, and sharpen their ability to engage in independent inquiry. The work in this area is designed to help students become aware of alternative approaches to human problems, and to see their role in a wider philosophical and historical perspective.

Implicit in this statement is the desire to promote a greater awareness of social, political, and economic issues so that the student's professional training in social work is completed in a context of involvement and commitment. In addition, these academic opportunities will be used to help students develop those techniques indispensable to good written and oral communication and the pursuit of a vigorous intellectual independence.

3. Field Observation, Volunteer Opportunities, and Field Instruction

A continuous range of experiential learning opportunities will be provided throughout the curriculum through required experiences or elected situations. Beginning with observation and volunteer work in a social, governmental, or educational institution in the first year, one additional opportunity will be offered in the sophomore year prior to two successive full-time agency field instructions. Further opportunities in this area will be available in the fourth year in connection with the senior project and seminar course. All work in this area will be under the supervision of RIT faculty.

Because the curriculum leading to the B.S. in Social Work contains a variety of social science offerings, the student will be able to choose a broad spectrum of career goals in addition to the possibility of a variety of graduate programs related to human services.

Graduates of RIT Social Work program are employed in agencies providing services to the following types of clientele:

- | | |
|----------------------|-------------------|
| Drug Counselling | Family Court |
| Delinquents | Mentally 111 |
| Unwed Mothers | Mentally Retarded |
| Probation and Parole | Senior Citizens |

CAREER OPPORTUNITIES

Employment is also available in agencies that provide such special services as:

- | | |
|-----------------------|---------------------------|
| Community Planning | Correctional Institutions |
| Metropolitan Planning | Schools |
| Hospitals | Day Care Centers |



Program Outline

SOCIAL WORK

NOTE: F--FAIL S-SPRING W--WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
GSWS-301 Introduction to the Field of Social Work.....	4			FIRST YEAR
GSWS-305 Social Work Field Study.....		2		
GSSA-201 Introduction to Anthropology.....			4	
GSSP-203 Psychology of Childhood & Adolescence.....			4	
GSSP-206 Fundamentals of Psychology.....		4		
GSSS-201 Fundamentals of Sociology.....	4			
• Other General Studies - Lower Division.....	4	8	4	
SBIG-210, 211 Biological Concepts 1, II.....	4	4		
Open Elective/Independent Study ¹			4	
^Physical Education Elective.....	0	0	0	
GSWS-302 Social Welfare 1: History..... ²	4			SECOND YEAR
GSWS-303 Social Welfare II: Profession and Issues.....		4		
GSWS-304 Social Welfare III: Organization and Systems.....			4	
GSWS-411 Methods of Social Work I ²			4	
GSWS-531 Research Methods.....			4	
GLLC-431, 432, 433 Spanish 1, II, III..... ¹	4	4	4	
GLLC-403, 402, 404 Interpersonal Communication Skills 1, II, III..... ¹	4	4	4	
GSSE-303, 304 Economics for Social Workers 1, II..... ²	4	4		
• Other General Studies - Lower Division.....	4	4		
^Physical Education Elective.....	0	0	0	
GSWS-421, 422 Field Instruction 1, II ³	5	5		THIRD YEAR
GSWS-412, 413 Methods of Social Work II, III ²	4	4		
GSWS-534 Junior Seminar.....			4	
GSSP-204 Dynamics of Abnormal Psychology.....			4	
• General Studies Elective - Upper Division.....			5	
Open Elective/Independent Study ¹			5	
GSWS-535 Senior Seminar and Project.....		4		FOURTH YEAR
GSWS-536 Senior Seminar.....			4	
GSSM-214 Theories of Political Systems.....	4			
GSSS-302 Family Systems.....		4		
GSSS-303 Social Discrimination.....	4			
GSSS-304 Deviance in Society.....			4	
• General Studies Electives - Upper Division.....	10	5	10	
Open Elective/Independent Study ¹		5		

- Seep. 89 for General Studies requirements.
- ¹See p. 171 for policy on Physical Education.
- M.S. Independent Study may be academic or at a social work agency, includes part-time placement in social work agency.
- ³Full-time field placement in social work agency.
- ⁴Student has option of Deviance in Society or Dynamics of Abnormal Psychology.

TRANSFERABILITY
Blanket credit for the first two years is offered for an A.A. or A.A.S. degree.

SOCIAL WORK PROGRAM OUTLINE FOR TRANSFER STUDENTS
WITH A.A. OR A.A.S. DEGREE

NOTE: F--FALL S-SPRING W--WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
GSWS-302 Social Welfare: History.....	4			THIRD YEAR
GSWS-304 Social Welfare: Organization and Systems.....	4			
GSWS-411 Methods of Social Work 1 and Lab ²	4			
GSWS-412, 413 Methods of Social Work II, IIP ²		4	4	
GSWS-421, 422 Field Instruction 1, II and Seminar ³		5	5	
GSWS-531 Research Methods.....	4			
GSWS-535 Senior Seminar and Project.....		4		FOURTH YEAR
GSWS-536 Senior Seminar.....			4	
Social Work Elective ⁴			4	
GSSM-214 Theories of Political Systems.....	4			
GSSS-302 Family Systems.....		4		
GSSS-303 Social Discrimination.....	4			
'Other General Studies Electives • Upper Division.....	10	10	10	



College of Graphic Arts and Photography

LOTHAR K. ENGELMANN, *Dean*

The College of Graphic Arts and Photography encompasses the School of Photographic Arts and Sciences, the School of Printing, and the Graphic Arts Research Center.

The School of Photographic Arts and Sciences was established in 1930 with a two-year course for the training of technicians for the photographic industry. It now offers undergraduate programs leading to a B.S. degree in photographic science and instrumentation, to a B.S. degree in professional photography, and to a B.F. A. degree in photographic illustration. A program in photographic management and marketing—given jointly by the School of Photographic Arts and Sciences and the College of Business—leads to the B.S. degree. A program in biomedical photography leading to an A. A.S. degree and a program in biomedical photographic communications leading to a B.S. degree are also offered. Graduate programs lead to an M.S. degree in photographic science and instrumentation, and to an M.F.A. degree in photography. More than 850 students are enrolled from nearly every state and many foreign countries. The curriculum in Photographic Science and Instrumentation is the only accredited program of its kind leading to the B.S. and M.S. degree.

In 1937 the Institute absorbed the Empire State School of Printing with the object of establishing advanced technological education in printing and the graphic arts. The School of Printing now offers programs leading to the Bachelor of Science degree in printing. Printing management, and printing technology are among the fields of specialization. It also offers programs leading to the M.S. degree in printing technology and printing education. About 490 degree candidates are enrolled in the School of Printing. Students come from almost every state, and students from many foreign countries have registered in printing programs.

The Graphic Arts Research Center, with its own full-time staff, conducts research in various fields of the graphic arts. It also conducts short, highly specialized courses for men and women engaged professionally in the graphic arts.

RESOURCES The College is housed in a building that has been specifically designed for instruction in photography and printing. Its many specialized laboratories and wide range of equipment make it the most complete of any degree-granting institution in these fields.

The faculty has been carefully selected on the basis of their teaching effectiveness and ability to relate well with students. They are also individuals who are educationally qualified and have had extensive professional experience and training in the graphic arts industries.



The establishment of two distinguished professorships highlights this qualification of the college's teaching staff. The Melbert B. Cary, Jr., professorship emphasizes the School of Printing's involvement in typography and design generally, while the James E. McGhee professorship highlights the School of Photographic Arts and Sciences' interest in the photographic processing and finishing, as well as in the photographic marketing and management areas.

Rochester is the world center of research and development in photography and a center of research in the graphic arts, as well as a city well-known for quality printing. It is an ideal environment for the student in either photography or the graphic arts because he has access to a faculty which is close to progress in these fields, and through guest lecturers, field visits, and meetings of scientific and professional organizations, he can meet many of these leaders in research and development personally.

The RIT library is rich in both photography and the graphic arts, and the cooperation of the George Eastman House of Photography and the library of the Kodak Research Laboratories makes available one of the largest collections of reference materials for these fields to be found anywhere.

Two special libraries are housed in the college directly, the Graphic Arts Research Center Library and the Cary Library. The latter contains the Melbert B. Cary, Jr., Graphic Arts Collection, with over 2,500 volumes of rare books illustrating the past and present of fine printing.

PLAN OF
EDUCATION

The College seeks to prepare men and women to be professionally competent in their chosen area and to have an appreciation and understanding of our cultural heritage and democratic institutions. Although the primary concern of the College itself is with science and technology, and the occupational aspects of life, it requires of every student courses in communication, the humanities, and the social and natural sciences. These form an integrated program of liberal education in the College of General Studies and require from one-quarter to one-third of the student's time.

The College operates on the quarter plan, each quarter being eleven to twelve weeks in length. There is no regular summer quarter, although many classes are available in the Summer Session.

Most programs of the College, except Printing, include a senior thesis as a requirement for the bachelor's degree. This involves independent study and research on a subject chosen by the student and approved by his advisor. The thesis provides the student the opportunity to make a detailed study of a subject of particular interest to him. It often requires wide reading, thus making the student more conversant with the literature and, where laboratory research is involved, the student acquires experience in the design of an experiment, the conduct of research, and the writing of a technical report. A number of these reports have been presented at meetings of scientific and professional societies and printed in appropriate journals.



With the growth of community, junior, and two-year technical colleges throughout the country, many young men and women have a better chance to identify their occupational and professional goals. The College recognizes the value of these programs and, for students who perceive such goals within the scope of the College's programs, every effort is made to accept the maximum amount of transfer credit from the two-year college curriculum. Some scholarships are available.

TRANSFERS

Candidates for the B.S. and B.F.A. degrees must complete the requirements of a major program, and they must also complete satisfactory thesis work.

DEGREES AND
REQUIREMENTS

Requirements for the M.S. degree in photographic science and instrumentation, printing technology, and printing education, and for the M.F.A. degree in photography are to be found in the Graduate Bulletin.

The Associate in Applied Science degree is awarded all students who successfully complete the requirements of the first two years of the B.S. or B.F.A. program and have a minimum number of quality points equal to at least 1.7 times the number of quarter hours required.

During the Summer Session the School of Printing offers a wide range of technical and management courses which may be taken for credit.

SUMMER SESSION
AND SPECIAL
PROGRAMS

Special, intensive summer courses are also available in graphic arts orientation, flexography, teletype composition, Linotype-Intertype maintenance, and similar subjects.

Additional specialized short-term summer programs can be designed by the School of Printing to meet the particular needs of paper, ink, and equipment manufacturers and related segments of the graphic arts industry.

The School of Photographic Arts and Sciences offers several special courses each summer to meet professional or avocational needs not met by the four-year programs.

Information on summer programs in either school can be obtained from the Director of the Summer Session or the Director of Extended Services.

GRAPHIC ARTS
RESEARCH CENTER

GARC serves the printing and graphic communications industry through research, continuing education, and the dissemination of information. It acts as an interface between RIT's academic programs and the commercial world of production and research. GARC's professional staff has been recruited from industry and research organizations. This experienced staff provides realistic counsel when lecturing or acting as undergraduate and graduate thesis advisors in the field of printing as well as in the field of photographic science. GARC's facilities are used in conjunction with lectures, seminars, and demonstrations for special students. And GARC information is made available to students in such publications as *Graphic Arts Literature Abstracts*, *Graphic Arts Patent Abstracts*, and GARC reports of research efforts.

The Science and Technology Section consists of fundamental research programs in color theory, color measurement and specification, paper technology, image evaluation, screenless lithography, study methods for gray balance determination, and photometric measurement of dot area.

The Physical Testing Laboratory, which emphasizes color reproduction, conducts industry-supported programs for testing paper, ink, and other printing products. Its facilities also accommodate test runs for the Science and Technology Section. And many of the continuing education programs (seminars in Web Offset Newspaper Training, Paper-Ink-Press, Composition Systems, and Color Reproduction) use the lab facilities, including the four-unit perfecting web offset press.

The Information Services houses an extensive international collection of literature relevant to the graphic arts. From its extensive holdings it offers the following services to both the educational and industrial communities:

Graphic Arts Literature Abstracts (GALA)—Formerly called Graphic Arts Index, *GALA* represents a new and expanded effort into current awareness and retrospective retrieval efforts within the graphic arts. *GALA*, published monthly on a subscription basis, offers subject categorized, fully indexed informative abstracts of the graphic arts literature as gleaned from the timely scanning of over 200 international publications, periodicals and conference proceedings.

Graphic Arts Patent Abstracts (GAPA)—A companion publication to *GALA*, *GAPA*, also available monthly on a subscription basis, offers categorized and indexed entry into the U.S. Patent Literature, as selected weekly from the Official Gazette of the U.S. Patent Office.

Other services available are customized graphic arts information systems and publications design, customized literature searches and bibliographies, and document procurement services.

School of Photographic Arts and Sciences

WILLIAM S. SHOEMAKER, *Director*

The program offerings of the School of Photographic Arts and Sciences are designed to prepare students for photographic career fields. The studies involve both technical and creative experiences for visual problem solving. Chemicals and specialized equipment are supplied. Students are encouraged to purchase photographic equipment that will further their chosen careers. All first year B.F.A. and B.S. students in professional photography are required to have their own hand-held small or medium format camera and a professional exposure meter. All upperclass professional photography students are required to have their own view camera and allied equipment. If desired, teachers will assist students in equipment recommendation. Guest speakers and field trips broaden the student's viewpoint. Participation in the spring field trip and summer study courses in Europe are encouraged.

The School of Photographic Arts and Science faculty represents a remarkable cross section of various photographic fields. Many faculty members possess not only formal degrees but recognition from professional societies in the form of honors and titles indicating professional excellence.

The School of Photographic Arts and Sciences offers (1) an undergraduate (B.S.) in Photographic Science and Instrumentation; (2) an undergraduate (B.F.A.) program in Photographic Illustration; (3) an undergraduate (B.S.) program in Professional Photography; (4) an undergraduate (B.S.) program in Photographic Processing and Finishing Management; (5) an associate's (A.A.S.) program in Biomedical Photography; and (6) a bachelor's (B.S.) program [Upper Division] in Biomedical Photographic Communications.

The School of Photographic Arts and Sciences offers two masters degree programs: M.F.A. in Photography and the M.S. in Photographic Science and Instrumentation. These are described in the separate Graduate Bulletin.

The School of Photographic Arts and Sciences offers a wide selection of photographic courses in the Summer Session. These range from beginning photography courses to those requiring a substantial photographic background. A special course is offered for high school and college art teachers desiring to build a background in basic photography. For detailed information write The Director of the Summer Session for a catalog.

FACULTY

PROGRAMS OF STUDY

GRADUATE PROGRAMS

SUMMER SESSION

104 ADMISSION TO PHOTOGRAPHY PROGRAMS

MEMBERSHIPS	<p>The School of Photographic Arts and Sciences maintains memberships in a number of professional organizations:</p> <ul style="list-style-type: none">American Management AssociationAmerican Society of Training and DevelopmentAssociation of Professional Color LaboratoriesMaster Photo Dealers and Finishers AssociationNational Microfilm AssociationProfessional Photographers of AmericaSociety of Motion Picture and Television EngineersSociety of Photographic Scientists and EngineersUniversity Film Association
REQUIREMENTS FOR ADMISSION	<p>All applicants for admission must meet the general requirements for admission to the Institute as described earlier. The requirements for admission to the School of Photographic Arts and Sciences vary with the program.</p> <p>All applicants, except those transferring from other colleges and universities, must take entrance examinations, as explained in the section on Entrance Requirements in this catalog.</p> <p>i Photographic Science and Instrumentation – Applicants for admission to the undergraduate program in Photographic Science and Instrumentation must have had three years of high school mathematics through trigonometry and either physics or chemistry. Their high school record should indicate a capacity to undertake a science program with a reasonable chance of success.</p> <p>/ Photographic Illustration – Applicants for admission to Photographic Illustration must have had one year of mathematics and one year of science.</p> <p>* Professional Photography – Applicants for Professional Photography should have had two years of high school mathematics, including either intermediate algebra or plane geometry, and one year of science.</p> <p>Biomedical Photography – Applicants for admission to the associates degree program must have had elementary algebra, plane geometry, intermediate algebra and trigonometry; also one year of science, with biology recommended.</p> <p>^ Biomedical Photographic Communications – Applicants for this upper division curriculum need the minimum of an associate degree, with one year of biology, one year of technical photography, and a minimum of two years in a communications specialty such as biomedical photography. A personal interview may be required. The RIT summer transfer course may be required.</p> <p>^ Photographic Processing and Finishing Management – Applicants for admission to these programs would fulfill the same requirements as those applying for Professional Photography.</p>
ADVANCE CREDIT AND TRANSFER PROGRAMS	<p>Advance credit will be given for applicable courses completed at accredited institutions with a grade of "C" (average) or better.</p>

There are transfer programs into the second or the third year of each of the four majors offered by the School. These are for students who have transferrable advance credits in science, art, business, and/or photography.

Photographic Science – A total of 39 quarter credits, including 12 acceptable quarter credits in general studies, acceptable courses in calculus (12 quarter credits) or higher mathematics, and general physics or chemistry of not less than one year each, plus a "C" grade or higher in 'PPHS-200 (Photographic Science) prior to admission to the second year.

REQUIREMENTS
FOR ADMISSION
TO SECOND YEAR

Photographic Illustration – A total of 30 quarter credits, including 12 acceptable credits in general studies and 6 acceptable credits in studio courses in drawing and design, plus a "C" grade or better in *PPHG-200 (Photography) and PPHG-210 (Materials and Processes).

Professional Photography – A total of 33 quarter credits, including 12 acceptable credits in general studies, an acceptable science course (9 quarter credits), or an acceptable design studio course (6 quarter credits) and a "C" grade or better in 'PPHG-200 (Photography) and PPHG-210 (Materials and Processes).

Photographic Processing and Finishing Management – A total of 37 quarter credits, including 12 quarter credits in general studies, acceptable credits in college math (6 quarter credits) and 16 quarter credits in a combination of business and management, plus a "C" grade or higher in 'PPHS-200 (Photographic Science).

Photographic Science – A total of 80 quarter credits, including 24 acceptable quarter credits in general studies, a minimum of 20 quarter credits in calculus or higher mathematics, and acceptable courses of not less than one year in general chemistry and general physics, plus a "C" grade or higher in 'PPHS-200 and PPHS-210 (Photographic Science) prior to admission to the third year.

REQUIREMENTS
FOR ADMISSION
TO THIRD YEAR

Photographic Illustration – A total of 93 quarter credits including 24 acceptable quarter credits in General Studies. The remainder of 69 quarter credits must include a minimum of 12 quarter credits of studio courses in Design and Drawing, plus 9 credits of History and Aesthetics of Photography, plus 48 credit hours of photography. If there are insufficient photography studio courses the applicant will be required to take PPHG-200 and PPHG-210 during the summer.

Professional Photography – A total of 96 quarter credits including 24 acceptable quarter credits in general studies, a satisfactory course in college algebra and design and 57 quarter credits in any combination of drawing, design or photography, of which 48 credits must be equivalent to PPHG-201, 202, 203, PPHP-301, 302, 303, and PPHP-311, 312, and 313.

'These are summer courses required by those persons who do not have a sufficient photographic background. Maximum of 24 students accepted.

*Bachelor of Science in
Photographic Science and Instrumentation*

RONALD FRANCIS, *Staff Chairman*

Photographic Science is concerned with the materials and processes of photography; Photographic Instrumentation with the application of photographic processes to science and technology. A primary objective of the photographic scientist is the improvement of existing materials and processes of photography and the development of new methods and materials. The instrumentation engineer is concerned with the planning of new applications of photography or the adaptation of existing methods to new or special requirements. Whereas chemists, physicists, and engineers of disciplines other than photography are employed in both of these activities, there is a need, on an increasing scale, for the specialist in photographic science and instrumentation.

Almost every segment of American business is an employer of graduates in photographic science and instrumentation; for example, aerospace, business machines, microelectronics, scientific instruments, graphic arts, industrial chemicals, and photographic equipment and materials. Aside from industry, many graduates are employed by governmental agencies and laboratories with military or government contracts in aerospace, aerial surveying, and information handling. Graduates with an interest in selling often move into positions as sales and technical representatives or as private consultants.

The department of Photographic Science and Instrumentation offers three programs leading to both undergraduate and graduate degrees: a four-year program resulting in a Bachelor of Science degree, a five-year program resulting in simultaneous awarding of Bachelor of Science and Master of Science degrees, and a graduate program for persons holding a Bachelor of Science degree in physics, chemistry, or engineering. In addition, it is possible for students with satisfactory credits in mathematics, chemistry, and physics to transfer into either the four-year or five-year program at the beginning of the second or third year by taking a transfer program during the summer quarter preceding transfer.

FOUR-YEAR Bachelor of Science in Photographic Science and Instrumentation — Course PROGRAM content is typical of engineering programs. It includes specialized courses in the physics and chemistry of radiation-sensitive systems, optics and image formation, and photographic system engineering, as well as the fundamental courses in mathematics, chemistry, and physics. An undergraduate thesis is required.

FIVE-YEAR Bachelor of Science and Master of Science in Photographic Science and Instrumentation — Course content during the first three years is similar to the Bachelor of Science program and provides the student with a background in mathematics, chemistry, physics, and basic photographic science and instrumentation. The fourth year is spent taking advanced elective courses in chemistry,

physics, mathematics, engineering, and/or photographic science and instrumentation. The fifth year is devoted to graduate courses and a graduate thesis.

Admission into the five-year program is normally made at the end of the third year. Applications should be sent to Dr. Gerhard Schumann, Professor, and Coordinator of the departmental graduate program.

Master of Science in Photographic Science and Instrumentation – The graduate program is designed to prepare persons holding a Bachelor of Science degree in physics, chemistry, or engineering, for photographic science and instrumentation. Applicants without acceptable understanding of photographic materials and processes are required to take a summer course before final admission to the graduate program. This full-time summer course, PPHG-700 (Principles of Photographic Science) begins in June and runs for ten weeks. Certain graduate courses are offered during the evening on a rotating basis for those desiring to obtain the Master of Science degree on a part-time basis. Information regarding which courses are offered in which years during the evening may be obtained from the department.

The graduate program is administered by the Council of Graduate Studies and is under the direction of Dr. Gerhard Schumann, Professor. See Graduate Catalog for particulars.

GRADUATE
PROGRAM

PHOTOGRAPHIC SCIENCE AND INSTRUMENTATION

Undergraduate Elective List

EEEE-461, 462 Electrical Engineering I, II
 PPHS-421, 422, 423 Photographic Chemistry
 PPHS-511, 512, 513 Optical Instrumentation
 PPHS-531, 532, 533 Theory of the Photographic Process
 PPHS-599 Independent Study
 PPRT-591 Reproduction Photography
 PPRT-592 Printing Plates
 PPRT-593 Printing Presses
 SCHO-231, 232 Organic Chemistry
 SCHA-311, 312 Analytical Chemistry
 SCHA-313 Introduction to Physical Chemistry
 SCHK-441, 442, 443 Physical Chemistry
 SMAM-307 Differential Equations
 SMAM-308 Engineering Mathematics
 SMAM-420 Complex Variables
 SMAM-501, 502 Advanced Differential Equations
 SPSP-314, 315 Modern Physics
 SPSP-411, 412 Electricity and Magnetism
 Others to be selected in consultation with advisors.

Graduate Elective List

EEEE-702 Introduction to Random Variables and Signals
 EEEE-734 Communication Techniques
 EEEE-735 Digital Data Transmission
 PPHS-751, 752, 753 Special Topics in Photographic Science
 PPRT-702 Graphic Reproduction Theory
 PPRM-702 Computers in Management
 SCHA-511, 512 Instrumental Analysis
 SMAM-611 Engineering Mathematics
 SMAM-612 Engineering Mathematics
 CASM-761 Reliability
 CASM-851 Non Parametric Statistics
 CASM-811, 812 Probability Theory and Application
 CASM-821, 822, 823 Theory of Statistics
 CASM-841, 842 Regression Analysis
 Others to be selected in consultation with advisors.

Program Outline

photographic science and instrumentation

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
PPHS-201, 202, 203 Photography for Scientists & Engineers..... SCHG-205, 206, 207 Chemical Principles SMAM-251, 252, 253 Calculus..... • General Studies Electives - Lower Division..... ^Physical Education Elective.....	4 4 4 4 0	4 4 4 4 0	4 4 4 4 0	FIRST YEAR
PPHS-301, 302, 303 Principles of Photographic Systems 1..... TCSP-205 Computer Techniques..... SMAM-305 Calculus..... SMAM-306 Differential Equations 1..... SPSP-311, 312, 313 University Physics..... • General Studies Electives - Lower Division..... ^Physical Education Elective.....	4 4 4 5 4 0	4 4 4 5 4 0	4 3 4 5 4 0	SECOND YEAR!
PPHS-401, 402, 403 Principles of Photographic Systems II..... PPHS-411 Statistical Inference..... PPHS-412 Statistical Design of Experiments..... PPHS-413 Statistics of Quality Control..... Professional Electives (Selected from undergraduate elective list)..... PPHS-421, 422, 423 Photographic Chemistry (5 year BS/MS program— may also be taken in 4th year)..... • General Studies Electives - Upper Division.....	5 3 Varies 4 5	5 3 3 4 5	5 3 3 4 5	THIRD YEAR
PPHS-501, 502, 503 Research..... PPHS-521, 522, 523 Imaging Systems and Evaluation..... Professional Electives (selected from undergraduate elective list)..... • General Studies Electives - Upper Division.....	2 4 To bring graduate to 184 5	4 2 under- credit 5	4 2 2 5	FOURTH YEAR BS PROGRAM
• General Studies Electives - Upper Division..... PPHS-421, 422, 423 Photographic Chemistry (if not taken during 3rd year)..... PPHS-890 Research..... Professional Electives (selected from undergraduate elective list).....	5 4 2 To bring quarter	5 4 4 undergr red its to	5 4 4 184	FOURTH YEAR BS/MS PROGRAM
PPHS-711, 712, 713 Theory of the Photographic Process..... PPHS-731, 732, 733 Principles of Instrumental and Photographic Optics..... PPHS-741, 742, 743 Analysis and Evaluation of Imaging Systems..... PPHS-890 Research and Thesis Guidance..... Professional Electives (selected from graduate elective list).....	3 3 3 9minimu To bring quarter 45	3 3 4 m raduate cred its to	3 3 3 3	FIFTH YEAR BS/MS PROGRAM

tUpon successful completion of the second year, the Associate in Applied Science degree is awarded.

• See p. 89 for General Studies requirements.

tSee p. 171 for policy on Physical Education.

*Bachelor of Fine Arts in
Photographic Illustration*

**Photographic Illustration
Photojournalism
Photography as a Fine Art
Film Making**

ARTHUR A. TERRY, *Staff Chairman*

The curriculum leading to a Bachelor of Fine Arts degree in Photographic Illustration is planned to prepare the student for those areas of photography which require the solving of visual communication problems. The student is encouraged to develop innovative and individualized responses to visual problems; he is expected to become sensitive to contemporary graphic design and to visual aspects of his society; he is asked to be a perceptive and responsible citizen of an evolving society.

The photo student who elects the B.F.A. program may produce advertising photography for magazines, direct mail pieces, posters, billboards, and packages. He may produce editorial photography, magazine illustrations, picture essays, and book illustrations. He may illustrate brochures, annual reports, and other visual materials for business, government, and educational institutions. He may make educational, entertainment or business films and TV commercials. He is qualified to teach photography and visual communications and to cooperate in the making of audio-visual materials. He is qualified to function as an artist using photography as his principal means of expression. He may become a scholar, photohistorian, photojournalist, or museum curator.

The Bachelor of Fine Arts program is sub-divided into four major areas of concentration, each of which is varied enough to provide the student with a broad-based photographic education. Each is also flexible enough in approach to provide the student who so desires within the advisory system to select those courses which provide for and best suit his particular individual needs.

110 PHOTOGRAPHIC ILLUSTRATION PROGRAM

Program Outline

bachelor of fine arts in photographic illustration

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
FADF-221, 222, 223 Design.....	2	2	2	FIRST YEAR
PPHG-201, 202, 203 Photography.....	7	7	7	
PPHG-211, 212, 213 Materials and Processes.....	3	3	3	
• General Studies Electives—Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
FADF-321, 322, 323 Design.....	2	2	2	SECOND YEAR
• General Studies Electives—Lower Division.....	4	4	4	
PPHL-301, 302, 303 History and Aesthetics of Photography.....	3	3	3	
PPHL-311, 312, 313 B.F.A. Photography II.....	6	6	6	
^Physical Education Elective.....	0	0	0	

MAJOR PHOTOGRAPHIC ELECTIVES:

- Photo Illustration Photography as a Fine Art
- Photojournalism Film Making

(All BFA students must select one of these electives as a two-year involvement)

FSCF-225, 226, 227 Art and Civilization	3	3	3	THIRD YEAR
• General Studies Electives—Upper Division	5	5	5	
Major Photo Elective.....	4	4	4	
Professional Electives (selected from BFA elective list)	4	4	4	
FSCF-325, 326 American Art.....	3	3		FOURTH YEAR
FSCF-327 Contemporary Tendencies in Art			3	
• General Studies Electives—Upper Division	5	5	5	
Major Photo Elective.....	4	4	4	
Professional Electives (selected from BFA elective list)	4	4	4	

• See p. 89 for General Studies requirements.

JSee p. 171 for policy on Physical Education.

Upon successful completion of the second year, the Associate in Applied Science degree is awarded.

BACHELOR OF FINE ARTS PROFESSIONAL ELECTIVE LIST

- PPHF-401, 402, 403 Film Making I
- PPHF-407, 408, 409 History and Aesthetics of Film
- PPHL-421, 422, 423 Nature Photography
- PPHL-521, 522, 523 Color Photo Workshop
- PPHL-411, 412, 413 Photojournalism I
- PPHL-401, 402, 403 Photography as a Fine Art I
- PPHL-431, 432, 433 Illustration Photography I
- PPHL-437, 438, 439 Visual Communications Workshop
- PPRT-591, 592, 593 Reproduction Photography,
Offset Platemaking, Offset Presswork
- PPHL-599 Independent Study
- Others to be selected in consultation with advisors.

*Bachelor of Science in
Professional Photography*
WALTER A. ELLING, *Staff Chairman*

The primary goal of the Professional Photography curriculum is to prepare the individual student for a career field involving photography as his chief means of support.

The program leading to the Bachelor of Science degree in Professional Photography is a challenging and rewarding study demanding a high degree of application of the student's evolving abilities. The student works toward developing his field of interest during his first two years and then selects his photographic program from a number of elective areas. These include course offerings in:

Advertising Photography	Industrial Photography
Audio-visual	Nature Photography
Color Photography	Photo Journalism
Corporate Publications	Portraiture
Engineering and	Process Control
Instrumentation	Reproduction Techniques
Film Making	Sensitometry
Illustration Photography	Television Production

In addition, within School of Photographic Arts and Sciences' divisions, other areas of study are available. Independent studies and group seminars are available to explore highly specialized techniques or to experience in-depth studies.

Emphasis is placed on the realities of current and projected trends, both within the profession, and in the socio-economic environment of which the graduate expects to become a part. To help achieve this, community projects are utilized to increase the student's ability to gain experience with the work-a-day world's problems, on a practical basis.

Broadly stated, this preparation involves studies and experiences in both technical and creative aspects of visual problem solving. The curriculum is planned to give the student skills in business as well as photography, to enable him to seek employment in the field of his choice.

112 PROFESSIONAL PHOTOGRAPHY PROGRAM

Program Outline

professional photography

NOTE: F-FALL-S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
FADF-221, 222, 223 Design.....	2	2	2	FIRST YEAR
PPHG-201, 202, 203 Photography.....	7	7	7	
PPHG-211, 212, 213 Materials and Processes of Photography	3	3	3	
* General Studies Electives ■ Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
Science Option Elective.....	3	3	3	SECOND YEAR
* General Studies Electives.....	4	4	4	
PPHP-301, 302, 303 Photography II	6	6	6	
PPHP-311, 312, 313 Basic Color.....	3	3	3	
^Physical Education Elective.....	0	0	0	
BBUB-245 Business Management or BBUB-263 Marketing.....	4	4	4	THIRD YEAR
BBUA-215 Survey of Accounting.....				
* General Studies Electives ■ Upper Division.....	5	5	5	
PROFESSIONAL ELECTIVES (Elect 2 Selected from B.S. Elective List)	8	8	8	
Business Electives.....	4	4	4	FOURTH YEAR
* General Studies Electives - Upper Division.....	5	5	5	
PROFESSIONAL ELECTIVES (Elect 2 Selected from B.S. Elective List)	8	8	8	

(t) Upon successful completion of the second year, the Associate in Applied Science degree is awarded.

* See p. 89 for General Studies requirements.

\$ See p. 171 for policy on Physical Education.

SCIENCE OPTION ELECTIVES (SECOND YEAR)

SMAM-201, 202, 203 College Algebra and Trigonometry
SCHG-281, 282, 283 General Chemistry
SSEG-201, 202, 203 Contemporary Science
SBIG-201, 202, 203 General Biology
SPSG-211, 212, 213 College Physics

And also the following may be considered if all necessary prerequisites have been met, and with approval of staff chairman:

SCHG-205, 206, 207 Chemical Principles
SCHC-211, 212, 213 General Chemistry

BACHELOR OF SCIENCE PROFESSIONAL ELECTIVE LIST

PPHF-401, 402, 403 Film Making I
PPHF-407, 408, 409 History and Aesthetics of Film
PPHF-501, 502, 503 Film Making II
PPHF-507, 508, 509 Introduction to TV Production
PPHL-411, 412, 413 Photojournalism I
PPHL-421, 422, 423 Nature Photography
PPHL-511, 512, 513 Photojournalism II
PPHM-301, 302, 303 Machine Processing
PPHP-407 A-V Preparations and Presentations
PPHP-408 Scientific and Technical Applications of Photography
PPHP-409 Corporate and Special Interest Publications
PPHP-411, 412, 413 Sensitometry
PPHP-421, 422, 423 Advertising Photography

PPHP-431 Forensic Photography
PPHP-441, 442, 443 Advanced Color Printing
PPHP-501, 502, 503 Industrial Photography Seminar
PPHP-511, 512, 513 Photographic Process Control
PPHP-521, 522, 523 Advanced Color Seminar
PPHP-541, 542, 543 Portrait Photography
PPHP-551, 552, 553 Special Topics
PPHP-599 Independent Study
PPRT-591, 592, 593 Reproduction Photography,
Offset Platemaking, Offset Presswork

Others to be selected in consultation with advisor.



Film Making and Television

REID H. RAY, *Coordinator*

The courses in Film Making I and II are designed for students who recognize the motion picture medium as an expressive force uniquely important in today's world. They are intended to acquaint students with artistic and social applications of film as a creative medium and to develop the skills of film production.

Offered to students in Professional Photography or Photographic Illustration, these courses are structured as lecture-laboratory courses, designed to develop individual skills in communicating with moving images, the sensitivities and practicalities of the medium and the aesthetic principles governing film as a form of art. Each student produces several short films, working closely through all phases of motion picture production: scripting, pre-production planning, budgeting, shooting, sound editing and working with a laboratory. Students combine their learning of visual and sound artistry through "hands-on" experience with camera and sound equipment. Each film project is designed by the individual student; they receive individualized instruction as they bring purposeful expression to the screen in a wide variety of styles.

116 PHOTOGRAPHIC PROCESSING PROGRAM

Program Outline

photographic processing and
FINISHING MANAGEMENT MAJORS

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
PPHS-201, 202, 203 Photography for Scientists and Engineers.....	4	4	4	FIRST YEAR
SMAM-201, 202 College Algebra and Trigonometry.....	3	3		
BBUB-201 Management.....	4			
BBUA-210 Accounting (Financial).....		4		
BBUA-211 Accounting (Managerial).....			4	
ICSS-200 Computer Science.....			4	
* General Studies Electives—Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	SECOND YEARt
PPHM-301, 302, 303 Machine Processing.....	4	4	4	
PPHP-311, 312, 313 Basic Color.....	3	3	3	
ITEE-310 Electricity.....	4			
ITEE-311 Electronics.....		4		
BBUB-401 Behavioral Science in Management.....			4	
* General Studies Electives—Lower Division.....	4	4	4	
^Physical Education.....	0	0	0	THIRD YEAR
PHP-511, 512, 513 Photographic Process Control.....	3	3	3	
GSSE-301, 302 Economics I and II.....	4	4		
Professional Electives**.....	4	4	4	
PPRM-503, 504 Statistics of Quality Control 1 & II.....		4	4	
* General Studies Electives - Upper Division.....	5		5	FOURTH YEAR
BBUM-263 Marketing.....			4	
BBUB-434 Operations Management.....			4	
Professional Electives**.....	12	8	4	
* General Studies Electives - Upper Division.....	5	10	5	

* See p. 89 for General Studies requirements.

tSee p. 171 for policy on Physical Education.

* Professional Elective must be chosen in consultation with the student's academic advisor. Recommended professional electives are PPHM-501, 502, 503; and PPHM-511, 512, 513.

tUpon successful completion of second year, the Associate of Applied Science degree is awarded.

It is recommended that students seeking the baccalaureate degree spend the summer of their Junior year in a work-block type program.

PHOTOGRAPHIC PROCESSING AND FINISHING MANAGEMENT

Professional Elective List

PPHS-301, 302, 303 Principles of Photographic Systems I
SCHG-205, 206, 207 Chemical Principles
PPHP-441, 442, 443 Advanced Color Printing
PPHS-411, 412, 413 Physics (Sensitometry)
PPHM-501, 502, 503 Training and Supervision of Photographic Processing and Finishing Laboratory Personnel
PPHM-511, 512, 513 Advanced Machine Processing
PPHM-599 Independent Study

BBUF-281 Money and Banking
BBUF-441 Finance (Financial Management)
BBUA-331, 332 Accounting I, II (Cost)
BBUB-301 Business Law
BBUB-404 Management (Business Policy)
GLLC-402 Conference Techniques
Others to be selected in consultation with advisors.

Associate in Applied Science in Biomedical Photography

NILE R. ROOT, R.B.P., *Coordinator*

The Biomedical Photography curriculum provides a two-year program leading to the Associate of Applied Science degree. A graduate may apply for entrance into the Biomedical Photographic Communications program for a Bachelor of Science degree.

The Biomedical Photography program is designed to prepare the student for a career in media production within the scientific community. The biomedical photographer can be part of the allied health teams in hospitals, medical and dental research centers or in other health institutions.

The first year courses introduce basic theories and principles as well as practical experience with photographic equipment and photographic processing. The courses are integrated to prepare the student for a summer internship in a medical or scientific facility. The completion of the summer internship is required for the Associate degree in Biomedical Photography.

The second year rounds out the prerequisites for a beginning career in Biomedical Photography. Courses include photomacrography, photomicrography and other specific studies required for this career.

The Biological Photographic Association, the certifying and registering professional organization in the biomedical photography field, has cooperated in the preparation of criteria and in program development. Thus the RIT program can provide the educational background which will form the basis for qualifying to become a Registered Biological Photographer (RBP), after he enters into his profession full time.

Program Outline

biomedical photography

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	FWS			
PPHB-201, 202, 203 Biomedical Photography I.....	6	6	6	FIRST YEAR
PPHG-211, 212, 213 Materials and Processes of Photography.....	3	3	3	
PPHB-211 Survey of Biomedical Photography.....	1			
SBIG-201, 202, 203 General Biology.....	4	4	4	
*General Studies Electives—Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
Summer (4th Quarter) Internship for 10 weeks in a medical setting.				
PPHB-301, 302, 303 Biomedical Photography II.....	5	5	5	SECOND YEAR
PPHP-311, 312, 313 Basic Color.....	3	3	3	
PPHB-331, 332, 333 Preparation of Biomedical Visuals.....	3	3	3	
* General Studies Electives—Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	

* See p. 89 for General Studies requirements.

JSee p. 171 for policy on Physical Education.

Bachelor of Science Degree in Biomedical Photographic Communications

NILE R. ROOT, R.B.P., *Coordinator*

The Biomedical Photographic Communications curriculum is an upper division program to prepare the student to be involved in advanced techniques of media production used in medicine and research. The junior and senior years' curricula include electives in Film Making, Television and Printing, which can be selected in consultation with the Advisor.

The curriculum provides the graduate with preparation to be an entering professional in biomedical communication, audio-visual and educational resource departments in medical schools, research centers and private hospitals, as well as other scientific facilities.

Transfer candidates must have an evaluation prior to admission. A personal interview may be required of the candidate for this program. The student may be required to attend summer courses to satisfy prerequisite courses.

Program Outline

BIOMEDICAL COMMUNICATIONS

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
Summer Transfer Communications/Biology or General Course if needed per evaluation				SUMMER
*Professional Elective.....	4	4	4	THIRD YEAR
• General Studies Electives - Upper Division.....	5	5	5	
Business Elective.....	4	4	4	
Science Elective.....	4	4	4	
Summer Internship (Optional)				
PPHB-501, 502, 503 Senior Thesis Project	4	4	4	FOURTH YEAR
• General Studies Electives • Upper Division.....	5	5	5	
• • Professional Electives.....	8	8	8	

• See p. 89 for General Studies requirements.

*Possible Recommended Professional Electives:

PPHF-401, 402, 403 Film Making I
PPRT-591, 592, 593 Reproduction Photography,
Offset Plate Making, Offset Presswork

Electives will be made with the Coordinator's permission.

Other electives with Advisor's consultation.

NOTE: Seep. 171 for policy on Physical Education.

School of Printing
MARK F. GULDIN, Director

The School of Printing at Rochester Institute of Technology is one of the relatively few educational institutions in the United States that offers major degree programs in printing. It is the largest degree-granting school in its field in the country, and enjoys a position of leadership because of its extensive laboratory facilities, its up-to-date programs of study, and its competent faculty.

The primary objective of the School of Printing is to prepare students—both men and women—for successful careers in the printing, publishing, and allied industries. Programs of study are especially directed toward careers in the areas of printing technology, printing production, and printing management.

These occupational objectives involve certain educational objectives. These are to help the student to develop the following: a broad understanding of the procedures involved in the major important printing processes; an appreciation of the aesthetic qualities of good printing; an understanding of the applications of science and engineering in the graphic arts; a knowledge of theory and practice in the various aspects of management; skills in communications; and an understanding of the student's professional and general environment as a means of developing himself as a well-rounded individual and a responsible citizen.

The graduate with a B.S. degree in Printing has available a variety of career choices. The printing industry is one of the country's largest, employing not only persons skilled in its own special technologies but also chemists, physicists, engineers, accountants, printing educators, marketing specialists, designers, artists, photographers, copy editors, computer specialists, production and traffic managers, and the closely-related packaging specialist. RIT has all of these programs within its nine colleges—men and women in the School of Printing have this unique opportunity to elect courses that give them a breadth in preparation for a career of their own choosing in this growing field.

General requirements for admission are given in the General Information section of this catalog. In addition, it is important that an applicant have an interest in printing, a keen mind, and industrious habits. Interest in printing may be shown by success in high school printing courses, by extracurricular activities in connection with a school newspaper or yearbook, by employment in a printing establishment, or by gaining an idea of the activities and opportunities in the field through investigation or personal associations. While high school graduation is stated as a basic requirement for admission, with intermediate algebra or plane geometry as a specific prerequisite, preference is given to applicants who have had some additional work in mathematics and to those who have successfully completed general courses in chemistry and physics.

OBJECTIVES

CAREER
OPPORTUNITIESSPECIAL
REQUIREMENTS
FOR ADMISSION

SCHOLARSHIPS AND
FINANCIAL AIDS

Scholarships available to students in the School of Printing number approximately 25, and range in value from \$250 to \$1100. Some of these awards may be continued beyond one year depending upon the records made.

Competitive scholarships are offered through the National Scholarship Trust Fund of the Education Council of the Graphic Arts Industry. Anyone interested in applying for one of these scholarships should do so early in the senior year in high school, since the application must be filed in advance of the date set for competitive examinations. If information is not available in the local high school, the candidate should write to:

Education Council of the Graphic Arts Industry
4615 Forbes Avenue
Pittsburgh, Pa. 15213

For information regarding scholarships administered by the Institute, write to Chairman, Scholarship Committee.

PROGRAM OF
STUDY

The School of Printing offers a four-year course of study that leads to the Bachelor of Science degree. The degree of Associate in Applied Science is offered upon successful completion of the first two years. Continuation beyond the second year depends upon the satisfactory completion of the first two years and a grade point average of at least 2.0.

The four-year program prepares graduates for a wide variety of technical and management positions in the printing and related industries. Among these are positions in administration and general management, production management, production and quality control, sales and sales management, estimating, cost and financial control, process and plant development, graphic design, and graphic arts research. A variety of positions in commercial printing, packaging, and service industries are available to graduates, as are positions in the book, newspaper, and magazine publishing industries.

The cooperative plan of education is available in the School of Printing for those choosing this option.

The two-year portion of the program is for those who wish to enter employment after two years of college study. Graduates of this program obtain employment as an assistant in such classifications as estimating, production control, specification writing, purchasing, copy preparation, typography and layout, and sales.

Graduates of two-year colleges are encouraged to transfer into the four-year program. Transfer students find that many of their two-year college credits are applicable toward the four-year degree.

The Printing program includes a group, or core, of basic required courses that is indicated in the following program outline. Students have the opportunity to expand their own areas of interest by selecting course combinations, or developing individual program sequences from approved elective courses.

TWO-YEAR
PROGRAMS FOR
COLLEGE GRADUATES

Many college graduates with baccalaureate degrees may complete the professional requirements for the Bachelor of Science degree in Printing in two years of concentrated study. This is because they have already satisfied many re-

quirements in general studies elsewhere. Upon admission, such students are given the equivalent of two years of credit. Those who have taken courses which parallel those required in their chosen majors in the School of Printing normally are given additional transfer credit, if grades are "C" or better.

The cooperative program in Printing is a flexible and voluntary program which will be available to printing students who have successfully completed the first two years of the required printing program and to printing transfer students accepted at the junior-year level. The intent of the cooperative program in Printing is to afford students the opportunity of enlarging and improving their college education by combining formal, classroom learning with practical work experiences. Printing students following the cooperative program will have a wide variety of graphic arts work experiences available to them. This cooperative program in Printing will require up to five years for completing B.S. degree requirements.

COOPERATIVE
PROGRAM

The School of Printing also offers a graduate program leading to the Master of Science degree, described in the separate Graduate Catalog. Information concerning this program is available upon request to the Office of Director of Admissions.

GRADUATE
PROGRAM

For purposes of program administration, planning, supervision, and student counseling, the School of Printing is organized into four divisions: Design-Composition, Photography-Plate-Press, Management, and Graduate.

ORGANIZATION

While each student is expected to use initiative in selecting elective courses, each division administers program sequences which may be developed from professional elective courses.

Design-Composition Division

EMERY E. SCHNEIDER, *Staff Chairman*

The creative opportunities in the graphic arts are enormous and attractive. It is necessary for most people in the graphic arts to have an appreciation for good design and typography because much of their time will be spent evaluating the printed word from the standpoint of design and production. Many printing firms have organized their own design and composition facilities in order to offer a complete service to their customers and, in turn, have a need for employing well-qualified people in these areas. In addition, the needs of advertising agencies for educated people in the creative fields and for printing buyers are extensive. For

these reasons, the Design-Composition Division not only offers introductory creative courses for those students who will pursue other areas of endeavor, but also administers sequences in the design field in which the student may specialize. These sequences include:

BOOK DESIGN AND
BOOK PRODUCTION

A sequence designed to prepare students to fill a variety of positions in the Book Publishing and Book Manufacturing industries. Although particularly oriented for those interested in Book Design, this flexible program can be altered to fit the specific needs of others interested in the wide range of opportunities the publishing industry has to offer.

DESIGN AND
TYPOGRAPHY

A program for those students with a basic interest in the aesthetics of printing. The student is given a broad range of courses, Calligraphy to Typography, Design to Copy Preparation, which are important for entering the field of design, typography, or any of the other creative fields of the printing industry.

COMPOSING ROOM
PROCEDURES

A sequence designed to give printing students an overview of typesetting techniques and the handling of materials as they are related to layout and design. The diversity and challenges in this field are reflected through a series of courses ranging from electronics in computerized typesetting through estimating and other management areas related to the composing room.

Photography-Plate-Press Division

CLIFTON T. FRAZIER, *Staff Chairman*

The production segment of the industry is the core area of most printing facilities. Every manager in the industry from design through sales and from personnel through finance must have a firm grasp of this core area if his decisions are to be valuable ones. This is the "home area" for the production manager in plants producing books, newspapers, forms or commercial printing. For these reasons, the Photography-Plate-Press Division acts chiefly as a service department for all students in the School of Printing, regardless of their area of specialty by offering courses in the various processes and materials pertaining to the graphic arts. This Division administers, however, three sequences in the production area which are:

LITHOGRAPHIC TECHNOLOGY This program gives the student an in-depth knowledge of lithographic management. The student is prepared for positions such as technical service representative, production scheduling, quality control analysis, and technical sales.

This sequence, offered in conjunction with the Department of Packaging Science, emphasizes the problems encountered in printing on many different kinds of materials, and in packaging many different kinds of products. This program prepares students for positions in production and sales with the packaging printer, an expanding segment of the graphic arts.

PACKAGING
PRINTING

A program for students who wish to specialize in the photomechanical processes in printing. The student is prepared for management positions with camera service departments within printing firms and with color separation service companies.

REPRODUCTION
PHOTOGRAPHY

Management Division

JAMES R. WALSH, *Staff Chairman*

The opportunities in the management segment of the graphic arts are varied and appealing. To facilitate a high-level, decision-making process, it is necessary for most management personnel in the graphic arts to have a clear understanding of the interrelationships that exist among the marketing, financial, personnel, and production segments of the industry. To this end, the Management Division offers course work in these various areas. In collaboration with the other divisions, the Management Division provides the "topping" for shaping future managers in the graphic arts. The sequences administered by this division are listed below:

Estimating is at the very heart of the successful economic well-being of the printing industry. Accurate job costing and analysis can mean the difference between success and failure for any printing concern. This sequence prepares students for positions found in every segment of the industry from commercial printing through packaging and specialized forms manufacturing.

ESTIMATING

Computers are of increasing importance to the printer as they can perform the usual business data processing tasks as well as the more involved specialized applications in typesetting and optical character reading devices. This sequence is designed to provide the student with a basic understanding of computers and of their potential in production management.

COMPUTER
APPLICATIONS

A program for students who wish to specialize in newspaper management. This NEWSPAPER sequence emphasizes production, labor, finance, and marketing in relation to the PRODUCTION newspaper industry. New technological changes in the industry are emphasized. MANAGEMENT

124 PRINTING MANAGEMENT

FINANCIAL MANAGEMENT	This sequence utilizes courses in both the School of Printing and the School of Business. Students prepare themselves for the financial aspects of managing a graphic arts business.
PERSONNEL MANAGEMENT	This sequence introduces the student to basic concepts of personnel management from a behavioral science standpoint. Drawing heavily on courses in the College of General Studies, the sequence prepares persons for positions in personnel management, labor relations, and other positions where the ability to work closely with individuals is of prime importance.
PRODUCTION MANAGEMENT	Students in this sequence are prepared to enter all phases of printing dealing with production problems in the commercial printing industry as well as in the newspaper, book, and magazine publishing industries. Management positions evolving from this sequence are that of scheduler, assistant production manager, and production manager.
SALES-MARKETING	This program prepares students for positions in printing sales and marketing, printing equipment sales, and typographic sales as well as positions as technical representatives for graphic arts supply firms. Students are also prepared for sales positions in allied industries such as ink, paper, and packaging, and for positions as printing buyers and brokers.



Program Outline

SCHOOL OF PRINTING

NOTE: F--FALL S-SPRING W--WINTER SR--SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
PPRT-201 Typographic Composition.....	3			FIRST YEAR
PPRT-202 Machine Composition.....	3			
PPRT-203 Layout and Printing Design.....	3			
PPRT-204 Relief Press.....		3		
PPRT-205 Gravure Printing.....		3		
PPRT-206 Reproduction Photography.....		3		
PPRT-207 Printing Plates.....			3	
PPRT-208 Lithographic Press.....			3	
PPRT-209 Screen Printing.....			3	
SMAM-201, 202,203 College Algebra, Trigonometry, Geometry.....	3	3	3	
• General Studies Electives--Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
PPRT-302 Photocomposition Systems.....	3			SECOND YEARt
PPRT-311 Imposition and Finishing.....		3		
PPRT-402 Applications of Electronics to Graphic Arts.....			3	
PPRM-201 Introduction to Technical Writing.....	3			
PPRM-302 Personnel Relations.....		3		
• • Science Option.....	4	4	4	
Professional Electives.....		4	4	
• General Studies Electives--Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
PPRT-410 Printing Surfaces.....	3			THIRD YEAR
PPRM-301 Applications of Computers to Graphic Arts.....			3	
PPRM-401 Estimating.....		3		
PPRM-403 Printing Production Management 1.....	3			
• • Science Option.....	4	4	4	
Professional Electives.....		4	4	
• General Studies Electives--Upper Division.....	5	5	5	
PPRM-501 Financial Controls.....			3	FOURTH YEAR
PPRM-503 Statistics of Quality Control.....		4		
PPRM-590 Senior Seminar.....	3			
Professional Electives.....	8	8	8	
• General Studies Electives--Upper Division.....	5	5	5	

• See p. 89 for the General Studies requirements.

• ♦ Approved three-quarter sequences are listed under Science Electives.

tUpon completion of the second year, the Associate in Applied Science degree is awarded.

tSee p. 171 for policy on Physical Education.

126 PRINTING ELECTIVES

Electives – The following electives supplement required courses. Each **student** elects courses to suit his individual interests and objectives, and to meet the **credit** requirements of the Printing program. Selection is subject to prerequisite requirements.

SCIENCE ELECTIVES

At least one sequence must be Chemistry, SCHG-281, 282, 283, or Physics SP5G-214, 215, 216. The other sequence can be Advanced Chemistry, Advanced Physics, Contemporary Science, Calculus, Computers, 1CSS-200, ICSS-210, ICSP-215, or Photography for Scientists and Engineers, PPHS-201, 202, 203.

PRINTING ELECTIVES

PROFESSIONAL ELECTIVES

Printing Management

PPRM-305	Magazine Writing and Design (Cr-3)
PPRM-402	Estimating II (Cr-4)
PPRM-404	Printing Production Management II (Cr-4)
PPRM-502	Financial Controls II (Cr-4)
PPRM-504	Statistics of Quality Control II (Cr-4)
PPRM-506	Business Law (Cr-3)
PPRM-509	Economics of Production Management (Cr-4)
PPRM-510	Personnel Relations II (Cr-4)
PPRM-511	Labor Relations in Graphic Arts (Cr-4)
PPRM-512	Collective Bargaining in the Graphic Arts (Cr-3)
PPRM-513	Sales Management (Cr-4)
PPRM-514	Newspaper Management (Cr-4)
PPRM-515	Legal Problems of Publishing (Cr-4)
PPRM-599	Independent Study (Cr-Arranged)

Printing Technology

PPRT 301	Typographic Composition (Cr-4)
PPRT 303	Layout and Printing Design (Cr-4)
PPRT 304	Advanced Relief Press (Cr-4)
PPRT 305	Gravure (Cr-3)
PPRT 306	Tone Reproduction Photography (Cr-3)
PPRT 307	Lithographic Plates (Cr-3)
PPRT 308	Lithographic Press Problems (Cr-4)
PPRT 309	Screen Printing (Cr-3)
PPRT 310	Relief and Gravure Platemaking (Cr-3)
PPRT 312	Stripping (Cr-3)
PPRT 313	Copy Preparation (Cr-4)
PPRT 314	Flexography (Cr-4)
PPRT 315	Ink and Color (Cr-4)
PPRT 316	Production for Book Publishing (Cr-3)
PPRT 317	Calligraphic Forms (Cr-3)
PPRT 319	Newspaper Design (Cr-3)
PPRT 320	Newspaper Production (Cr-3)
PPRT 321	Web Offset (Cr-3)
PPRT 401	Typographic Workshop (Cr-4)
PPRT 403	Layout and Printing Design (Cr-4)
PPRT 406	Color Separation Photography (Cr-3)
PPRT 501	Development of Printing Types (Cr-3)
PPRT 506	Advanced Color Reproduction (Cr-3)
PPRT 591	Reproduction Photography (Cr-3)
PPRT 592	Printing Plates (Cr-3)
PPRT 593	Printing Presses (Cr-3)



College of Science
 THOMAS P. WALLACE, *Dean*

The College of Science has undergraduate programs in biology, chemistry, mathematics, physics, chemical technology, medical technology, and nuclear medicine technology.

CHOICE OF MAJORS A student may enroll in the College of Science as a Science major without designating a specific major. In consultation with an advisor, a program will be designed to meet his individual needs and goals. The program can be flexible and cover a number of introductory college level courses in science.

To illustrate, the following is a typical distribution of courses for the first year as a Science major:

SCIENCE MAJOR

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	FWS			
*SBIG-201, 202, 203 General Biology.....	4	4	4	FIRST YEAR
*SCHC-211, 212, 213 General Chemistry.....	4	4	4	
SMAM-251, 252, 253 Calculua.....	4	4	4	
*SPSP-311, 312 University Physics.....		5	5	
General Studies Elective.....	4	4	4	
Physical Education.....	0	0	0	

*Any two of these three in a given quarter

Prior to the end of the first year, the student should decide upon a specific major and may then enroll as a candidate for a degree in one of the departments: Biology, Chemistry, Mathematics, Physics.

DECLARED The student who has definitely decided upon his specific major field will indicate a MAJOR choice when applying, and may therefore be enrolled as a candidate for a degree in that department upon admittance by the Institute. A program will be designed to prepare the student for competency in his chosen profession.

The programs in the College of Science are sufficiently flexible to allow the student to obtain an in-depth background in a discipline other than the chosen major. A wide selection of elective courses in such areas as business, chemistry, photography, computer science, physics, mathematics, and biology, make it possible to take a series of courses which could result in an elective concentration (i.e., minor) in an area related to but not required for the major.

Each of the departments has majors programs operating on a five-year cooperative work-study plan. In addition, the Biology Department has a four-year program in Medical Technology, the Physics Department has a four-year program in Nuclear Medicine Technology, and the Chemistry Department has a three-year cooperative program in Chemical Technology and a program leading to the Master of Science degree.

Graduates of the five-year programs in the College of Science receive a Bachelor of Science degree. These graduates qualify for professional work in processing and laboratory operations, research and experimental work, or supervision of technical projects, as well as for graduate education leading to the Master of Science or Doctor of Philosophy degrees.

The Cooperative Plan – The school year is divided into four 11-week quarters, Fall, Winter, Spring, and Summer. Students in the Biology, Chemistry, Mathematics, and Physics programs attend classes at the Institute during the Fall, Winter, and Spring for the first and second year. At the beginning of their third year, employment arrangements are made for students in the five-year cooperative programs. Students are assigned to A and B Sections for the last three years of attendance. Students in Section A attend classes during the Fall Quarter while those in Section B work on their cooperative jobs. The two sections interchange at the beginning of the Winter Quarter, when students in Section B attend classes and those in Section A work in industry. This interchange of the work-study periods continues throughout the remainder of the third, fourth and fifth years. The study-work section to which the student is assigned is designated by the Coordinator of Employment.

The diagram below illustrates the cooperative schedule as it applies to students in the five-year programs.

PLAN OF
EDUCATION

		FALL	WINTER	SPRING	SUMMER
<i>1st and 2nd yrs.</i>		RIT	RIT	RIT	VACATION
<i>3rd, 4th, yr-</i>	A	RIT	WORK	RIT	WORK
	B	WORK	RIT	WORK	RIT
<i>5th yr.</i>	A	RIT	WORK	RIT	-
	B	WORK	RIT	RIT	-

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TRANSFER CREDIT

Students with Associate degrees in a comparable program from other educational institutions normally can expect to transfer at the Junior year level. Transfer credit is granted for those studies which parallel Institute courses in the curriculum for which admission is sought.

Transfer students applying for a program at RIT, similar to their previous college study are expected to present an accumulative average of "C" or above. Students making significant program changes will be evaluated on the probability of their success in the new program, with the grades earned in previous study only a part of the criteria.

It is also RIT policy to grant credit by examination, in lieu of course credits, for subjects that parallel the objectives and content of courses for which advanced credit is being sought. Contact the Director of Admissions for policy and procedures.

Chemical Technology – Candidates enrolled in the Chemical Technology program spend their initial quarter in classes at the Institute. At the completion of the first quarter, the class is divided into two sections and each section alternates between academic and industrial quarters for the duration of the three-year program.

The diagram below illustrates the cooperative schedule for the Chemical Technology program.

		FALL	WINTER	SPRING	SUMMER
<i>1st year</i>	A	RIT	RIT	WORK	RIT
	B	RIT	WORK	RIT	WORK
<i>2nd year</i>	A	WORK	RIT	WORK	RIT
	B	RIT	WORK	RIT	WORK
<i>3rd year</i>	A	WORK	RIT	WORK	-
	B	RIT	WORK	RIT	-

BIOLOGY**JAMES L. BAIRD, JR.,** *Head*

The Department of Biology offers programs leading to the A.S. degree in Biology, the A.A.S. degree in Medical Technology, and B.S. degrees in Biology and in Medical Technology.

The program of the Department of Biology prepares students to pursue graduate **CAREER** degrees in a wide variety of biological disciplines as well as the medical arts. **OPPORTUNITIES** Students terminating their education at the B.S. level find rewarding positions in occupations related to the life sciences, including medical research laboratories, food and other agriculturally related industries, pharmaceuticals, and environmental organizations.

By proper choice of electives, students may prepare to specialize in biological instrumentation techniques leading to careers in biological technology, as well as in environmental or medical science.

The major function of the Medical Technology program, which leads to the Bachelor of Science degree, is the preparation of students for employment in hospital laboratories, industrial-medical or research laboratories, and pharmaceutical companies. This program has been accepted by the Board of Registry of Medical Technologists of the American Society of Clinical Pathologists as meeting all requirements prior to the Registry examination.

Candidates enrolled in the Medical Technology program attend classes at the Institute during the Fall, Winter, and Spring quarters for three years. The fourth (final) year is spent at a hospital approved by the American Society of Clinical Pathologists for training medical technologists.

The Medical Technology program is affiliated with Rochester General Hospital, St. Mary's Hospital in Rochester and Buffalo's Millard Fillmore Hospital. Students may, however, seek admission to any approved hospital for their internship.

Requirements Leading to the A.S. and B.S. Degrees in Biology and the B.S. Degree in Medical Technology

The student must meet the minimum graduation requirements of the Institute as described on page 38 and in addition must complete the requirements contained in the particular program listed below or its equivalent as determined and approved by the Biology Department. In conjunction with a faculty advisor, individual student programs will be established to meet particular needs, interests, and goals. A planned elective concentration in another field such as Chemistry, Physics, Computer Science, Mathematics, Business, or Photo Science is possible.

Program Outline

BIOLOGY

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
SBIG-201, 202, 203 General Biology.....	4	4	4	FIRST YEAR
SCHG-215, 216, 217 General Analytical Chemistry	4	4	5	
SMAM-204,214,215 Modern Algebra, Introduction to Calculus.....	4	3	3	
SMAM-251, 252, 253 Calculus.....	4	4	4	
• General Studies Electives—Lower Division.....	4	4	4	SECOND YEAR A.S. DEGREE
^Physical Education Elective.....	0		0	
♦Biology Elective	4	4	4	
SPSG-211, 212, 213 College Physics.....	4	4	4	
or				THIRD AND FOURTH YEAR
SPSP-311, 312, 313 University Physics.....	5		5	
SCHO-231, 232, 233 Organic Chemistry.....	4	4	4	
'General Studies Electives—Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	FIFTH YEAR B.S. DEGREE
"Biology Elective.....	ForW 8		S or SR 8	
Institute-wide Elective	4		4	
'General Studies Electives—Upper Division	5		5	FIFTH YEAR B.S. DEGREE
"Biology Elective	ForW 8		S 4	
Institute-wide Elective	4		8	
'General Studies Elective.....	5		5	

*See p. 89 for General Studies Requirements.

JSee p. 171 for policy on Physical Education.

*For the B.S. degree, 60 hours in Biology must be distributed as follows:

3 quarter courses in General Biology; 2 quarter courses in each area of molecular and cellular biology; developmental biology, genetics and ecology; organismal biology; and 1 quarter course in biological techniques.

Program Outline

medical technology

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
SBIG-201, 202, 203 General Biology.....	4	4	4	FIRST YEAR
SCHG-215, 216, 217 General Analytical Chemistry.....	4	4	5	
SMAM-221, 222, 223 College Math.....	4	4	4	
• General Studies Elective—Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
SBIO-305, 306 Physiology and Anatomy.....		4	4	SECOND YEAR A.A.S. DEGREE
SCHO-231, 232 Organic Chemistry.....	4	4		
SPSG-211, 212, 213 College Physics.....	4	4	4	
ICSP-205 Computer Techniques.....	3			
• General Studies Elective—Lower Division.....	4	4	4	
Institute-wide Elective.....			4	
(Physical Education Elective.....)	0	0	0	
SBIG-401 Immunohematology.....	3			THIRD YEAR
SBIO-404, 405 Microbiology.....	5	4		
SCHB-301, 302 Biochemistry.....		5		
SBIT-432, 433 Biology Laboratory Techniques.....		4	4	
SMAM-309 Statistics.....			4	
Institute-wide Elective.....			4	
• General Studies Elective—Upper Division.....	5	5	5	
The fourth year of this program is taken at an approved hospital for training medical technologists.				B.S. DEGREE

• See p. 89 for General Studies requirements.
(See p. 171 for policy on Physical Education.)



CHEMISTRY

ROBERT E. GILMAN, *Head*

The Department of Chemistry offers programs leading to the A.S. degree in Chemistry, the A.A.S. degree in Chemical Technology, the B.S. degree in Chemistry and the M.S. degree in Chemistry.

The A.A.S. degree in Chemical Technology involves a three-year curriculum and incorporates direct industrial cooperative employment. The Chemical Technology curriculum is designed to integrate the component skills, knowledge, and attributes necessary for the performance of industrial laboratory tasks. Emphasis is placed on laboratory experiences centered about qualitative and quantitative analysis. Advanced laboratory work is designed to teach the student special laboratory techniques and modern instrumentation.

The five-year program in Chemistry leads to the Bachelor of Science degree and has been approved by the Committee on Professional Training of the American Chemical Society. Graduates qualify for higher level positions in the several fields of chemistry including professional industrial work in processing and laboratory operations, research and experimental work, supervision of technical projects, and managerial positions. A number of graduates continue their education for the M.S. or Ph.D. degrees in Chemistry.

Requirements Leading to the A.S. and B.S. Degrees in Chemistry and the A.A.S. Degree in Chemical Technology

The student must meet the minimum graduation requirements of the Institute as described on page 38 and in addition must complete the requirements contained in the particular program listed below or its equivalent as determined and approved by the Chemistry Department. To meet the requirements leading to the B.S. degree approved by the Committee on Professional Training of the American Chemical Society, the student must take specifically designated courses in chemistry and related sciences and must complete a minimum of 190 quarter credit hours and 380 quality points. In conjunction with a faculty advisor, individual student programs will be established to meet particular needs, interests, and goals. A planned elective concentration in another field such as biology, physics, computer science, mathematics, business, or photo science is possible.

Program Outline

chemistry

NOTE: F—FALL W—WINTER	S-SPRING SR-SUMMER	QUARTER CREDIT HOURS			
		F	W	S	
SCHC-211, 212, 213 General Chemistry.....		5	5	5	FIRST YEAR
SMAM-251, 252, 253 Calculus.....		4	4	4	
ICSP-205 Computer Techniques.....				3	
• General Studies Electives—Lower Division.....		4	4	4	
fPhysical Education Elective.....		0	0	0	
SCHA-311, 312 Analytical Chemistry.....		4	4		SECOND YEAR A.S. DEGREE
SCHP-313 Introduction to Physical Chemistry.....				4	
SMAM-305 Calculus.....		4			
SMAM-306, 307 Differential Equations.....			4	4	
SPSP-311, 312, 313 University Physics.....		5	5	5	
• General Studies Electives—Lower Division.....		4	4	4	
^Physical Education Elective.....		0	0	0	
SCHO-431, 432 Organic Chemistry.....			For W	S or SR	THIRD YEAR
SCHP-441, 442 Physical Chemistry.....			5	5	
GLLC-421, 422 German			4	4	
• General Studies Electives—Upper Division			5	5	
SCHO-433 Organic Chemistry.....			For W	S or SR	FOURTH YEAR
SCHP-443 Physical Chemistry.....			5		
SCHC-401 Chemical Literature.....			4		
SCHI-551 Inorganic Chemistry.....			2	4	
• General Studies Electives—Upper Division			5	5	
Institute-wide Electives (2).....				8	
SCHI-552 Inorganic Chemistry.....			For W	S	FIFTH YEAR B.S. DEGREE
SCHA-511 Instrumental Analysis			3		
• Chemistry Electives (2).....			5		
Institute-wide Electives (4).....			6	16	

• See p. 89 for General Studies requirements.

tSee p. 171 for policy on Physical Education.

**A minimum of 6 hrs. of electives must be SCH— 500, 600 courses.

Program Outline

chemical technology

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	FW	or S		
SCHT-241, 242 Chem. Tec 1, II.....	6		7	FIRST YEAR
SCHT-251 Mathematics for the Technologist.....	4			
SMAM-201, 202 Mathematics.....	3		3	
GLLC-311 Effective Composition.....	4			
PPRM-201 Introduction to Technical Writing.....			3	
• General Studies Elective—Lower Division			4	
^Physical Education Elective.....	0		0	
SCHT-243, 244 Chem Tec III, IV.....	SR or F		W or S	SECOND YEAR
SMAM-203 Mathematics.....	6		5	
SMAM-309 Statistics.....	3			
SPSG-211 College Physics			4	
• General Studies Electives—Lower Division.....	4		4	
Institute-wide Elective	4		4	
^Physical Education Elective.....	0		0	
SCHT-305, 306 Chemistry Specialty.....	SR or F		W or S	THIRD YEAR S.S.DEGREE
SPSG-212, 213 College Physics.....	4		4	
SCHT-309 Glassblowing Techniques.....	4		4	
SPSP-301 Electronics for Technologists.....	2		3	
Institute-wide Electives.....	4		4	

• See p. 89 for General Studies requirements.
JSeep. 171 for policy on Physical Education.

MATHEMATICS**THOMAS C. UPSON**, *Acting Head*

The Department of Mathematics offers programs leading to the A.S. and the B.S. degrees in Mathematics. The A.S. degree will ordinarily be completed in two years and involves no cooperative employment. The B.S. degree involves a five-year curriculum and incorporates industrial cooperative employment during the third, fourth and fifth years. However, the Department of Mathematics will design a special curriculum for students who do not desire to participate in the system of cooperative employment. Graduates qualify for positions in industrial institutions and business concerns as well as for graduate studies leading to a M.S. or Ph.D. degree, not only in mathematics but a number of other fields as well.

A student's program is designed to prepare the graduate not only in mathematics but also in related fields. In particular, the combination of Mathematics and Computer Science enhances the student's cooperative employment opportunities and is an extremely desirable background for industrial and business employment or for continuation of studies at the graduate level.

Requirements Leading to the A.S. and B.S. Degrees in Mathematics

The student must meet the minimum graduation requirements of the Institute as described on page 38 and in addition must complete the requirements contained in the particular program listed below or its equivalent as determined and approved by the Mathematics Department. In conjunction with a faculty advisor, individual student programs will be established to meet particular needs, interests, and goals. A planned elective concentration in another field such as biology, chemistry, physics, computer science, business, or photo science is possible.

Program Outline

mathematics

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
SMAM-251, 252, 253 Calculus.....	4	4	4	FIRST YEAR
SMAM-210 Freshman Seminar.....	1	1		
ICSP-205, 206 Computer Techniques	3	3		
SMAM-341 Foundations of Mathematics.....			4	
* Science.....	4	4	4	
• General Studies Elective—Lower Division	4	4	4	
^Physical Education Elective.....	0	0	0	
SMAM-305 Calculus.....	4		4	SECOND YEAR A.S. DEGREE
SMAM-306, 307 Differential Equations.....		4	4	
SMAM-351, 352 Probability and Statistics.....	4	4		
SMAM-361 Mathematical Modeling			4	
♦ Elective.....	4	4	4	
• General Studies Electives—Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
SMAM-431, 432 Linear Algebra.....	For W		S or SR	THIRD YEAR
SMAM-411, 412 Real Variables.....	4		4	
♦ Elective.....	4		4	
♦ General Studies Electives—Upper Division	5		5	
SMAM-531, 532 Abstract Algebra.....	4		4	FOURTH YEAR
Mathematics Elective.....	4		4	
• General Studies Electives—Upper Division	4		4	
	5		5	
Mathematics Elective.....	For W		S	FIFTH YEAR B.S. DEGREE
♦ Elective (2).....	4		4	
♦ Elective (2).....	8		8	
• General Studies Electives—Upper Division	5		5	

NOTE: A detailed analysis of the above program is contained in a brochure prepared by the Department of Mathematics and available upon request.

*See p. 89 for General Studies requirements.

†See p. 171 for policy on Physical Education.

- One of the following introductory sequences, including the associated laboratory.

SBIG 201, 202, 203 General Biology
 SCHC-211, 212, 213 General Chemistry
 SCHG-205, 206, 207 Chemical Principles
 SPSP-311, 312, 313 University Physics

#The primary objective of these unspecified electives is to fulfill the requirement of a minor concentration in one of the areas mentioned in the preceding page. After that requirement is fulfilled, the electives become entirely free electives.

PHYSICS
JOHN S. SHAW, *Head*

The Physics Department offers programs leading to the A.S. and B.S. degrees in Physics, as well as the A.A.S. and B.S. degrees in Nuclear Medicine Technology

The B.S. degree in Physics is a five-year program with a cooperative work experience. Graduates with this degree find employment opportunities with industrial, academic, and government agencies, or continue their education in M.S. or Ph.D. programs in physics or physics-related areas, such as biophysics, atmospheric science, or industrial business administration.

The B.S. in Nuclear Medicine Technology is a four-year program, the first three of which are on-campus and the fourth year consists of clinical training at a hospital site. Graduates of this program find employment as Nuclear Medicine Technologists in hospitals or research institutions.

Requirements Leading to the A.S. and B.S. Degrees in Physics and the A.A.S. and B.S. Degrees in Nuclear Medicine Technology

The student must meet the minimum graduation requirements of the Institute as described on page 38 and in addition must complete the requirements contained in the particular program listed below or its equivalent as determined and approved by the Physics Department. In conjunction with a faculty advisor, individual student programs will be established to meet particular needs, interests, and goals. A planned elective concentration in another field such as biology, chemistry, mathematics, computer science, business, or photo science is possible.

Program Outline

physics

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
SMAM-251, 252, 253 Calculus.....	4	4	4	FIRST YEAR
SCHG-205, 206, 207 Chemical Principles.....	4	4	4	
SPSP-200 Physics Orientation	0	0	0	
SPSP-311, 312 University Physics.....		5	5	
ICSP-215 Programming Language.....	4			
• General Studies Electives—Lower Division.....	4	4	4	
^Physical Education Elective.....	0	0	0	
SMAM-305 Calculus.....	4			SECOND YEAR A.S. DEGREE
SMAM-306, 307 Differential Equations.....		4	4	
SMAM-308 Engineering Math			4	
SPSP-313 University Physics.....	5			
SPSP-314, 315 Introduction to Modern Physics.....		4	4	
SPSP-321 Elementary Physical Analysis.....		3		
• General Studies Electives—Lower Division.....	4	4	4	
Institute-wide Elective	4	4		
^Physical Education Elective.....	0	0	0	
SPSP-431, 432 Electronic Measurements.....	For W		S or SR	THIRD YEAR
• SPSP-411, 412 Electricity and Magnetism.....	3		3	
• SPSP-455 Optical Physics.....	4		4	
• General Studies Elective.....	4		5	
Institute-wide Elective	5		4	
• SPSP-401, 402 Intermediate Mechanics.....	4		4	FOURTH YEAR
• SPSP-415 Thermal Physics.....	4			
SPSP-421, 422 Experimental Physics.....	2		2	
SPSP-501 Theoretical Physics			5	
• General Studies Elective.....	5		5	
SPSP-552 Atomic Physics & Quantum Mechanics.....	For W		S	FIFTH YEAR B.S. DEGREE
SPSP-521 Advanced Experimental Physics.....	4			
SPSP-531 Solid State Physics.....	3		4	
SPSP-553 Nuclear Physics.....			4	
* General Studies Elective.....	5		5	
Institute-wide Elective	4		4	

- See p. 89 for General Studies requirements.
- tSee p. 171 for policy on Physical Education.
- SPSP-411, 412, 455 given in 1974-75 and alternate years;
- SPSP-401, 402, 415 given in 1975-76 and alternate years.

Program Outline

NUCLEAR MEDICINE TECHNOLOGY

NOTE: F—FALL S—SPRING W—WINTER SR—SUMMER	QUARTER CREDIT HOURS			
	F	W	S	
SMAM-221, 222, 223 College Mathematics.....	4	4	4	FIRST YEAR
SCHG-215, 216, 217 General and Analytical Chemistry.....	4	4	b	
SBIG-201, 202 General Biology.....	4	4		
• General Studies Electives—Lower Division.....	4	4	4	
Institute-wide Elective			4	
(Physical Education Elective.....)	0	0	0	
SPSP-211, 212, 213 College Physics.....	4	4	4	SECOND YEAR A.A.S.
SCHO-231, 232 Organic Chemistry.....	4	4		
S BIO-305, 306 Physiology and Anatomy.....		4	4	
SMAM-309 Statistics.....			4	
• General Studies Electives—Lower Division.....	4	4	4	
Institute-wide Elective	4			
(Physical Education Elective.....)	0	0	0	
SPSP-351, 352, 353 Radiation Physics	5	5	5	THIRD YEAR
SCHB-301, 302 Biochemistry.....	5	5		
SBIT-430 Radiation Biology.....			4	
SBIT-432 Biology Laboratory Techniques.....			4	
• General Studies Electives—Upper Division	5	5	5	
Institute-wide Elective	4	4		
The fourth year is spent in an approved hospital.				
B.S. DEGREE				

• See p. 89 for General Studies requirements.
(See p. 171 for policy on Physical Education.)



Institute College

ROY I. SATRE, JR., *Dean*

Organized at RIT in 1973, Institute College is the ninth college within the administrative framework of Rochester Institute of Technology. It incorporates the previously existing School of Applied Science, Department of Computer Science and Technology, Department of Packaging Science, and the Center for Community/Junior College Relations. The Center for Community/Junior College Relations offers courses at the graduate level.

In 1968, the Center for Community College Faculty Development was formed, with its primary function the training of faculty for the two-year college career programs. In 1970, a new School of Applied Science evolved from the program of the CCCFD, offering upper-division baccalaureate programs to graduates of civil, electrical, and mechanical engineering technology curricula from the two-year colleges.

In 1972, the name of the Center was changed to Center for Community/Junior College Relations. This Center now incorporates an Office of Faculty Development and an Office of Community Junior College Articulation. Major emphasis is on closer relationships with two-year colleges as they relate to upper-division transfer to RIT.

Both the School of Applied Science and the Center for Community/Junior College Relations have expanded rapidly to include additional curricula designed to meet their original objectives. At the same time, they have established close relationships with many two-year colleges. By so doing, they can build upon the curricula of the associate degree granting institutions and supply faculty in those areas of technical and professional education where a demonstrated need exists.

Also in 1972, a new department of Packaging Science was established to offer courses leading to the Bachelor of Science degree in packaging science and technology. This department became functional in September 1973.

The Department of Packaging Science draws heavily upon courses offered in other schools and colleges of the Institute. With the addition of several packaging science courses, the broadly developed curriculum is representative of the areas of knowledge that are basic to the packaging science industry.

Computer Science and Technology — an existing program since 1971 — became a department of Institute College in June of 1973. This department is also closely related to the two-year colleges and has an active upper-division component besides offering the freshman and sophomore years.

RESOURCES Since Institute College is geared toward programs of practical application, it is necessary that well-planned laboratory and shop facilities be made available to students in upper-division and graduate courses. These are shared with the College of Engineering and constitute some of the finest facilities and equipment available for such work.



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MEMBERSHIPS

Institute College holds institutional membership in the American Association of Community and Junior Colleges, the New York State Association of Junior Colleges, and the Association of Upper Level Colleges and Universities.

ACCEPTANCE OF THE ASSOCIATE DEGREE

The School of Applied Science functions as an upper-division unit only. Holders of the associate degree from a community, junior, or technical college (or other similar two-year institutions), will receive full credit for those programs if they enroll in an upper-division curriculum leading to the Bachelor of Technology degree in Engineering Technology (B. Tech.). As members of the junior (or third year) class, they may complete the baccalaureate degree in three years as co-op students.

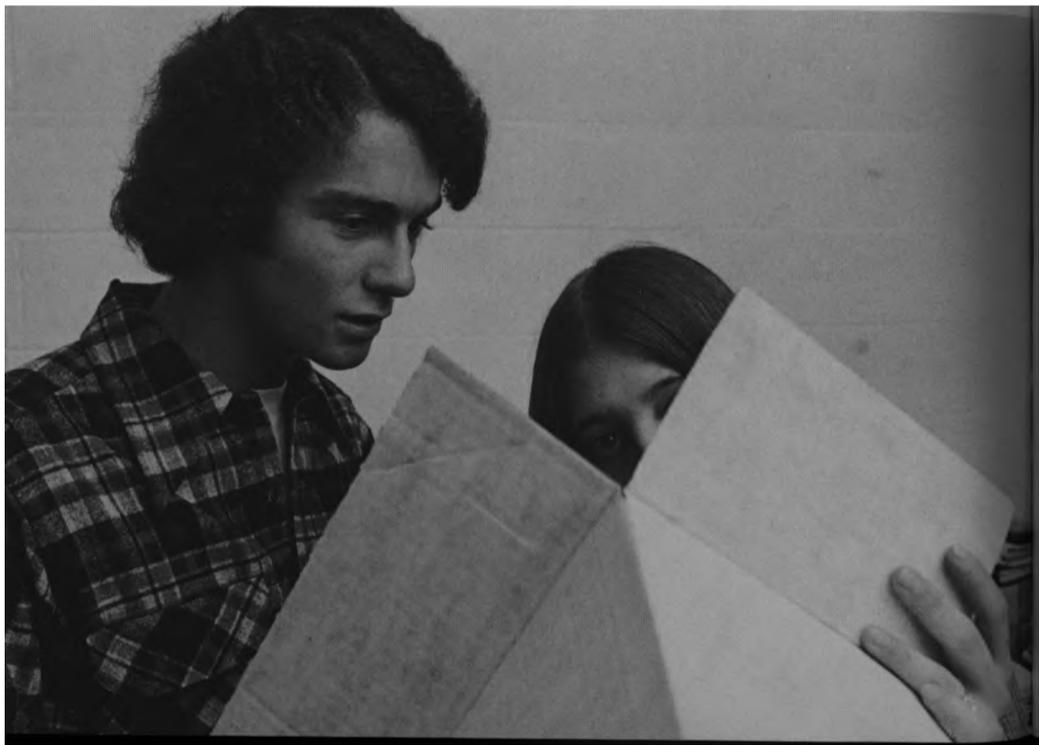
The departments of Computer Science and Technology, and Packaging Science, admit students into the upper-division years and accept the associate degree at full value. They also conduct a four-year curriculum into which high school graduates are admitted.

FACULTY

Members of the professional staff have had considerable experience in the industrial field and/or teaching in two-year and four-year colleges, and have completed graduate programs in the various fields of their specialties.

PROGRAM PLANNING

Each student in the Institute College is considered individually when his program is planned. The diversity of subject backgrounds from the two-year colleges necessitates an almost tailor-made pattern-of courses for the individual. In this process, the student can be assured of building upon previous courses and knowledge of his field, assuring that his associate degree retains the integrity it deserves, and guaranteeing, as far as possible that previously studied material will not be repeated.



School of Applied Science

JAMES D. FORMAN, *Director*

The School of Applied Science offers *only upper-division* (junior and senior) level work in Civil Engineering Technology, Electrical Engineering Technology, and Mechanical Engineering Technology. All lead to the Bachelor of Technology (B. Tech.) degree.

These programs are designed to accept only graduates of associate degree programs in similar technical fields and to provide a direct continuation of study in the student's area of specialization. Although each discipline area consists of a carefully integrated program of professional training, liberal education, and on-the-job, real world experience, each student is considered individually when his program is planned. In this way the student builds upon his previous knowledge and experience in his career field in a manner to best meet his needs.

The graduate—an engineering technologist—is a distinct type of professional whose main concern and interest is with existing technology in the fabrication, operation, maintenance, and management of products and processes. As such, he qualifies for positions where he is called upon to fulfill his role within the broad engineering requirements of business, industry, and government.

All programs in the School of Applied Science are pursued on the Cooperative COOPERATIVE Education Plan. This involves alternate periods of academic study and related industrial employment.

PLAN

Students are assisted in finding work with an employer where this experience is related to their career goals, and, when feasible, in a geographic location of the student's choosing.

Advantages of this plan are:

1. An enriched learning experience giving more meaning to academic studies.
2. Enhanced possibility of being accepted for a higher level position than is typically offered college graduates entering their first employment.
3. Provision for a substantial income to defray the cost of completing the bachelor's degree.

Electrical and Mechanical Engineering Technology students are placed in A or B sections, with work and academic assignments alternating on a quarter basis as shown in the table below:

YEAR		FALL	WINTER	SPRING	SUMMER
3 and 4	A	RIT	WORK	RIT	WORK
	B	WORK	RIT	WORK	RIT
5	A	RIT	WORK	RIT	—
	B	WORK	RIT	RIT	—

The slightly different schedules for Civil Engineering Technology students provides opportunity for summer employment for each group.

YEAR		FALL	WINTER	SPRING	SUMMER
3	I	RIT	WORK	RIT	WORK
	II	WORK	RIT	WORK	RIT
4	I	WORK	RIT	WORK	RIT
	II	RIT	WORK	RIT	WORK
5	I	RIT	WORK	RIT	—
	II	WORK	RIT	RIT	—

ADMISSION REQUIREMENTS

Admission to the bachelor of technology degree programs in the School of Applied Science is open to persons meeting the following requirements:

1. An associate degree in Civil or Construction Technology, Electrical Technology, Mechanical Technology, a comparable associate degree program, or an acceptable equivalent.
2. A recommendation from the director of the technology program in which the degree was completed.

PROGRAM REQUIREMENTS

School of Applied Science students are required to complete twenty-three quarter credit hours of general studies with passing grades. Unless suitable physical education credit is transferred, students are also required to complete up to three physical education electives with passing grades (see policy statement on p. 171).

GRADUATION REQUIREMENTS

The minimum requirements for the B. Tech degree in engineering technology are:

1. Satisfactory completion of the prescribed program.
2. A minimum cumulative quality point average of 2.0 with passing grades in a minimum of 95 quarter hours of credit.

**UPPER-DIVISION BACCALAUREATE PROGRAM
IN CIVIL ENGINEERING TECHNOLOGY**

The Civil Engineering profession requires the services of many individuals with a wide range of backgrounds and interests—technicians, technologists and engineers.

CURRICULUM

The technologist translates the innovative concepts of the engineer into functioning systems and structures, using the language of codes, working drawings, specifications, and construction.

All students enter this program at the third year level, having already received an associate degree in Civil or Construction Technology, or an acceptable equivalent. The curriculum, oriented toward the area of environmental controls, has its first two quarters concentrated on the fundamentals of hydraulics, chemistry, microbiology, and mathematics. Succeeding technical courses are of a practical nature and are design oriented.

Experience gained in the cooperative education plan is especially valuable. A large number of students work in their co-op jobs for consulting engineers as construction inspectors, members of survey crews, and draftsmen. Several co-op students work in water and wastewater treatment plants, operating control panels, performing laboratory tests, and doing routine maintenance work. (It is possible to obtain an operator's license while on this type of assignment). Other students work for town engineering departments, state agencies, construction companies, and industrial construction departments.

CO-OP
PLAN

Successful completion of this curriculum will provide the student with an excellent background in the techniques of pollution abatement. Graduates could expect to find employment with consulting engineers, in supervisory positions of pollution control facilities, or in the engineering departments of various federal state or local government agencies.

TECHNICAL
ELECTIVES

By the time the student enters his last two academic quarters, he will probably have developed certain special interests within his field. Therefore, the student is permitted to select his technical elective from existing courses offered by the:

- a. School of Applied Science
- b. College of Engineering
- c. College of Science

Program Outline

6

program leading to the b.tech degree
CIVIL ENGINEERING TECHNOLOGY

NOTE: F--FALL S-SPRING W--WINTER SR-SUHMER	QUARTER CREDIT HOURS			
	F or W S or SR			
COMPLETION OF AN APPROPRIATE ASSOCIATE DEGREE AT A TWO-YEAR COLLEGE				FIRST AND SECOND YEAR
'(SMTM-420 Introduction to Solutions of Engineering Problems).....	(4)			THIRD YEAR
SMTM-421 Solution of Engineering Problems 1	4			
ITEC-420 Hydraulics.....	4			
ITEC-428 Report Writing.....	2			
SCHG-271 Chemistry of Water 1.....	3			
General Studies Elective (Lower Division).....	4			
^Physical Education Elective.....	0			
'(SMTM-421 Solution of Engineering Problems 1)			(4)	
SMTM-422 Solution of Engineering Problems II.....			4	
ITEC-430 Water Supply and Distribution			3	
SCHG-272 Chemistry of Water II			3	
SBIG-440 Environmental Microbiology.....			4	
General Studies Elective (Lower Division).....			4	
^Physical Education Elective.....			0	
'(SMTM-422 Solution of Engineering Problems II).....	(4)			FOURTH YEAR
ITEC-434 Environmental Pollution	3			
ITEC-436 Design of Sanitary and Stormwater Drainage Systems.....	3			
ITEC-438 Principles of Treatment of Water and Sewage.....	5			
ITEC-440 Mechanical Equipment.....	3			
*ITEE-414 Basic Electrical Principles.....	4			
^Physical Education Elective.....	0			
ITEC-510 Design of Water Treatment Facilities.....			3	
ICSP-205 Computer Techniques.....			3	
ITEC-513 Computer Techniques in Civil Technology Lab.....			1	
ITEC-514 Land Planning.....			2	
ITEC-516 Structural Analysis and Design.....			4	
General Studies Elective (Upper Division)			5	
ITEC-520 Design of Wastewater Treatment Facilities	4			
ITEC-524 Solid Wastes.....	4			
Technical Elective.....	4			
General Studies Elective (Upper Division)	5			
*ITEC-541 Engineering Economics.....			3	
*ITEC-544 Contracts and Specifications.....			3	
*ITEC-546 Professional Principles and Practices.....			2	
Technical Elective.....			4	
General Studies Elective (Upper Division)			5	

'Entering students will take SMTM-420 or SMTM-421 depending on an evaluation of their mathematics background. Those students assigned to SMTM-420 will be taking a 3-course sequence in Solution of Engineering Problems, and will, therefore, defer taking ITEE-414 until the first quarter of the fifth year (in lieu of a technical elective).

*Offered in Spring Quarter only.

tSee p. 171 for policy on Physical Education.

UPPER-DIVISION BACCALAUREATE PROGRAM IN ELECTRICAL ENGINEERING TECHNOLOGY

The Bachelor of Technology degree in Electrical Engineering Technology is a relatively new professional program designed to meet the growing needs for technologists in a technology-oriented society.

The term *technologist* is used to define the graduate of this program—one whose professional training is in the application of existing technology and devices to the solution of routine engineering design problems.

The Bachelor of Technology program in Electrical Engineering Technology offered at Rochester Institute of Technology is an upper-division program. The upper-division feature of the program provides a viable transfer option to those students who have completed their associate degree and desire to continue their education in technology. All students enter the program at the third year or junior level as transfers from existing two-year associate degree Electrical Technology programs. The first two quarters of course work are designed to provide uniform mastery in the field of mathematics, circuit theory and materials for design. The remaining four quarters of course work consists of professional courses with elective options in the field of electrical power, communications, and digital computer design. Elective courses are available for the student to pursue his chosen option and to provide course work that complements his professional objectives. The Institute provides a wide variety of course offerings and the student is urged to make full use of these offerings in developing his professional program.

The curriculum also includes one year of cooperative work experience and thus provides important training in the solution of real technical problems.

Like all programs at Rochester Institute of Technology, a thorough grounding in the humanities is required, and students in the Bachelor of Technology program have 23 elective quarter courses in the areas of Science and Humanities, Social Science and Literature.

A student who completes his first two years at a community college and then enters the Bachelor of Technology program at Rochester Institute of Technology finds that the total cost of his education is significantly less than at a four-year private institution. In addition, his cooperative employment not only prepares him for direct employment in industry but also provides income to defray the major portion of his educational expenses.

THE CURRICULUM

Program Outline

program leading to the b.tech degree
ELECTRICAL ENGINEERING TECHNOLOGY

NOTE: F—FALL S-SPRING W—WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F or W S or SR			
COMPLETION OF AN APPROPRIATE ASSOCIATE DEGREE AT A TWO-YEAR COLLEGE				FIRST AND SECOND YEAR
ITEE-401 Circuit Theory I.....	5			THIRD YEAR
ITEM-411 Engineering Materials 1.....	4			
• (SMTM-420 Introduction to Solutions of Engineering Problems).....	(4)			
SMTM-421 Solution to Engineering Problems 1	4			
General Studies Elective (Lower Division).....	4			
^Physical Education Elective.....	0			
ITEE-402 Circuit Theory II.....			4	
ITEM-412 Engineering Materials II.....			4	
• (SMTM-421 Solution of Engineering Problems 1).....			(4)	
SMTM-422 Solution of Engineering Problems II.....			4	
ICSP-302 Computer Applications in Engineering Problems 1			1	
General Studies Elective (Lower Division).....			4	
^Physical Education Elective.....			0	
• (SMTM-422 Solutions to Engineering Problems II).....	(4)			FOURTH YEAR
ITEE-404 Control Systems 1.....	4			
ITEE-424 Logic and Digital Devices.....	4			
ITEE-428 Linear Amplifier Design.....	4			
General Studies Elective (Upper Division)	5			
ITEE-520 Electrostatic and Magnetic Fields			4	
ITEE-532 Power Amplifier Design.....			4	
ITEE-540 Pulse Circuits.....			4	
General Studies Elective (Upper Division)			5	
Technical Specialization Option				FIFTH YEAR
(Communications 1, Power Systems 1, Digital Design 1)				
Technical Elective.....	4			
Free Elective.....	8			
ITEM-436 Engineering Economics	3-5			
Technical Elective.....			4	
General Studies Elective (Upper Division)			8	
			5	

*Entering students will take SMTM-420 or SMTM-421 depending on the evaluation of their mathematics background. Those students assigned to SMTM-420 will be taking a 3-course sequence in Solution of Engineering Problems, and will, therefore, defer taking one fourth year General Studies elective until their fifth year thus reducing the elective choices by one course.
JSee p. 171 for policy on Physical Education.

TECHNICAL ELECTIVES
(Each carries 4 Quarter Credit Hours)

ITEE-538	Digital Computer Design 1	ITEE-551	Protective Relaying
ITEE-539	Digital Computer Design II	ITEE-552	Power System Stability
ITEE-544	I.C. Theory and Applications	ITEE-548	DC and AC Machine Design
ITEE-524	Microwave Systems	ITEE-526	Semi-Conductor Physics
ITEE-534	Communication Systems 1	ITEE-554	Electronic Optic Devices
ITEE-535	Communication Systems II	ITEE-556	Transmission Lines and Filters
ITEE-536	Control Systems II	ITEE-580	Senior Project
ITEE-521	Electromagnetic Fields and Antennas	ITEM-425	Statistical Quality Control
ITEE-546	Industrial Electronics	ITEM-550	Topics in Machine Design
ITEE-550	Power Systems 1		for Electrical Majors

UPPER-DIVISION BACCALAUREATE PROGRAM IN MECHANICAL ENGINEERING TECHNOLOGY

CURRICULUM

The baccalaureate program in Mechanical Engineering Technology is an upper-division program, in which students who have completed an associate degree curriculum, or its equivalent, can further upgrade their technological skills.

At RIT, the student spends his first two quarters improving on his prior training in the fundamentals of mathematics, mechanics, and electricity. During his second quarter, in consultation with his advisor, he elects his area of specialization, either Manufacturing or Systems Design. In the former, he takes courses relating to the manufacturing function—including technology and management. The Design major pursues courses in mechanical design, controls, and finishes with a two-quarter course where he designs, fabricates and tests a device of his choice.

All students will take an appropriate sequence of technical electives, either within their own specialty or as a means of broadening their skills in parallel technologies. Those with special interests may take courses in such areas as Graphic Arts or Packaging Technology for instance.

Graduates of this program are already occupying important positions in product design, testing, field engineering, marketing, manufacturing engineering and production.

TECHNICAL ELECTIVES (Each carries 4 Quarter Credit Hours)

ITEM-427	Reliability
ITEM-432	Production Control
ITEM-433	Cost Analysis
ITEM-434	Industrial Organization and Management
ITEM-436	Engineering Economics
ITEM-442	Heat Transfer
ITEM-450	Applied Vibrations
ITEM-462	Fluid Power Systems
ITEM-490	Production Planning
ITEM-503	Topics in Mechanical Design
ITEM-515	Manufacturing Technology
ITEM-530	Instrumentation
ITEM-532	Control Principles and Devices
ITEM-540	Thermal Technology
ITEM-550	Topics in Machine Design for Electrical Majors

Additional Technical Electives in both Electrical and Mechanical Programs may be chosen from existing courses offered by the Institute subject to Departmental approval.

Program Outline

program leading to the b.tech degree
MECHANICAL ENGINEERING TECHNOLOGY

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT HOURS			
	F or W S or SR			
COMPLETION OF AN APPROPRIATE ASSOCIATE DEGREE AT A TWO-YEAR COLLEGE				FIRST AND SECOND YEAR
• (SMTM-420 Introduction to Solution of Engineering Problems)	(4)			THIRD YEAR
SMTM-421 Solution of Engineering Problems 1	4			
ITEM-401 Mechanical Design Concepts 1	4			
ITEM-411 Electrical Principles for Design 1	4			
General Studies Elective (Lower Division)	4			
^Physical Education Elective.....	0			
• (SMTM-421 Solution of Engineering Problems 1)			(4)	
SMTM-422 Solution of Engineering Problems II.....			4	
ITEE-402 Mechanical Design Concepts II.....			4	
ITEE-412 Electrical Principles for Design II.....			4	
General Studies Elective (Lower Division)			4	
^Physical Education Elective.....			0	
• (SMTM-422 Solution of Engineering Problems II).....	(4)			FOURTH YEAR
D ITEM-403 Mechanical Design Concepts III.....	4			
D ITEM-440 Applied Thermodynamics.....	4			
M ITEM-480 Methods Analysis.....	4			
M ITEM-472 Tool Engineering.....	4			
Technical Elective.....	4			
General Studies Elective (Upper Division)	5			
D ITEM-520 Introduction to Systems Design			4	
D ITEM-460 Applied Fluid Mechanics.....			4	
Technical Elective.....			4	
M ITEM-470 N/C Applications.....			4	
M ITEM-425 Statistical Quality Control.....			4	
M ITEM-431 Production Management.....			4	
General Studies Elective (Upper Division)			5	
D ITEM-534 Servomechanisms.....	4			FIFTH YEAR
D ITEM-500 Systems Design Project 1.....	4			
M ITEM-462 Fluid Power Systems.....	4			
M ITEM-510 Process Design 1.....	4			
Technical Elective.....	4			
General Studies Elective (Upper Division)	5			
**D ITEM-501 Systems Design Project II.....			4	
**M ITEM-511 Process Design II.....			4	
Technical Elective.....			4	
Technical Elective.....			4	
Free Elective.....			5	

• Entering students will take SMTM-420 or SMTM-421 depending on an evaluation of their mathematics background. Those students assigned to SMTM-420 will be taking a 3-course sequence in Solution of Engineering Problems, and will, therefore, delete a technical elective in the fourth year.

• Offered Spring quarter only.

D:Systems Design Speciality Major
Manufacturing Technology Major

JSee p. 171 for policy on Physical Education.

Department of Computer Science and Technology

RICHARD T. CHENG, *Chairman*

The Department of Computer Science and Technology offers Bachelor of Technology degrees in: PROGRAMS

COMPUTER SYSTEMS
SYSTEMS SOFTWARE SCIENCE

The Department will also offer a Bachelor of Science degree, pending the approval of the New York State Department of Education, in:

APPLIED SOFTWARE SCIENCE

The Computer Science degree programs at Rochester Institute of Technology are designed to meet the manpower demand of industries, government and educational institutions. In addition to theoretical fundamentals, practical aspects of Computer Science are emphasized. Hands-on opportunity is provided and encouraged. Graduates of this department will be fully prepared to enter employment as staff members in computer installations and application departments or enrolled in graduate schools to pursue advanced studies.

PHILOSOPHY
AND
OBJECTIVES

1. *Freshman* — High school graduates with four years of English, Elementary and Intermediate Algebra, and one year of Science. In addition, Plane Geometry and Trigonometry are required for students in Applied Software Science.
2. *Transfer Students* — Graduates from two-year programs in computer technology or data processing from an accredited program will receive full credit for their two-year degree and enter Rochester Institute of Technology as juniors. The exact program they take at RIT will be planned according to the courses they have taken, grades received and recommendations of their faculty at the previous college attended.

ADMISSION
REQUIREMENTS

A Bachelor of Technology degree candidate in Computer Science and Technology will elect a minor in any relevant degree program at RIT such as Engineering, Mathematics, Physical Science or Business.

MINORS

Under RIT's Co-op program, students alternate their classroom study with actual field work experience in computer science areas. Aside from making their education more relevant, the Co-op opportunity allows the student to help finance his education, and traditionally qualifies graduates for higher starting positions and salaries due to their experience. Co-op work assignments are shown in the table below. A student may elect block A or B to work in industry, starting in the junior year.

COOPERATIVE
PROGRAM

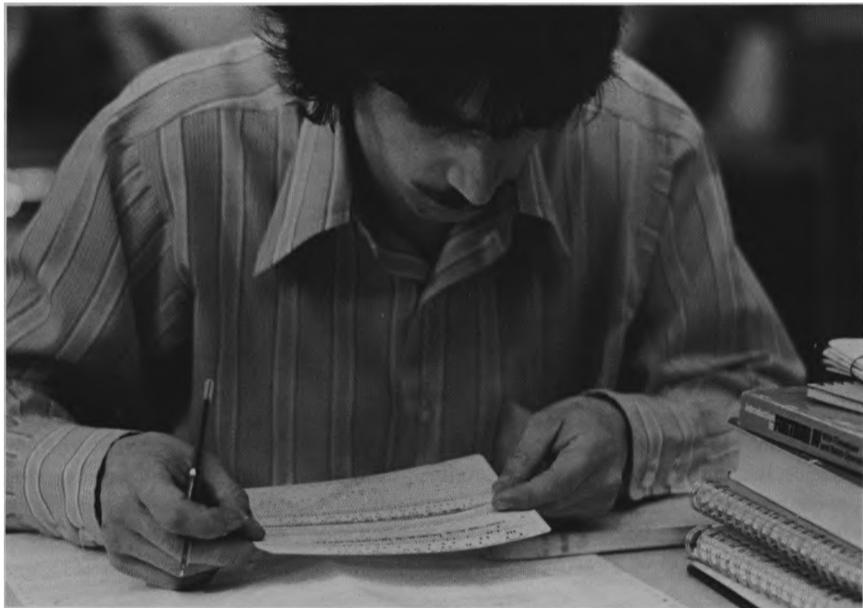
YEAR	FALL	WINTER	SPRING	SUMMER
3	A	B	A	B
4	A	B	A	B
5	A	B	—	—

LABORATORIES AND COMPUTER FACILITIES

In addition to the Xerox Sigma-6 Computer in the Computer Center, there is a remote job entry system and time-sharing terminals in the Library Computer Center. The Department of Computer Science and Technology has two laboratories, consisting of electronics equipment, CRT terminals, teletypes, graphic terminals and computer systems. A PDP-11 computer with 32 K bytes core, high speed printer and floppy disk system, is used for operating system development and for general software work. A Microdata 1621D dual processor computer with 16 K bytes core, 2K x 16 ROM and 1K x 16 AROM is provided for microprogramming and multi-processing studies. An IBM 1620 with 20K position core is available, as are all laboratory facilities, to Computer Science students. In addition, logic trainers and microprocessors are available for experimentation.

GRADUATION REQUIREMENTS

A Computer Science and Technology student will be allowed to graduate after successful completion of 194-198 quarter credit hours of planned course work and a minimum of four quarters of co-op blocks.



COMPUTER SYSTEMS
(Bachelor of Technology Degree)

This program is designed to provide students with a broad background in computing. A student may choose an area of concentration in Business, Mathematics, Engineering, or other relevant curriculum at RIT as a minor. Generally, this program is oriented to prepare Management System Analysts, Information System Designers, and Business Applications programmers.

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT			
	FW		S	
ICSS-200 Introduction to Computer Science	4			FIRST YEAR
ICSP-209 Introduction to Data Systems.....	4			
ICSP-215 Programming Language.....		4		
ICSS-230 Discrete Structure.....		4		
ICSP-305 Assembly Language Programming.....			4	
SMAM-204 Modern Algebra.....	4			
SMAM-214 Introductory Calculus.....		4		
SMAM-309 Statistics.....			4	
• General Studies Elective (Lower Division).....	4	4	8	
(Physical Education Elective.....)	0	0	0	
ICSP-301 COBOL Programming.....	4			SECOND YEAR
ICSS-320 Data Structure		4		
ICSS-310 Programming System Design.....			4	
Computer Science Electives.....	4	4	4	
Minor Electives.....	4	4	4	
• General Studies Electives (Lower Division).....	4	4	4	
(Physical Education Elective.....)	0	0	0	
ICSS-311 Programming Systems Analysis.....	F/W		S/SR	THIRD YEAR
ICSS-440 Operating Systems.....	4		4	
Computer Science Electives.....	4		4	
Minor Electives.....	4		4	
• General Studies Electives (Upper Division).....	5		5	
ICSS-525 Assemblers, Interpreters and Compilers.....	4		4	FOURTH YEAR
ICSS-420 Communications and Data Based Systems.....			4	
Computer Science Electives.....	4		4	
Minor Electives.....	4		4	
• General Studies Electives (Upper Division).....	5		5	
ICSS-450 Computing Management.....	4		4	FIFTH YEAR
ICSS-550 Computer Science Review.....			4	
Computer Science Electives.....	2-4		2-4	
Minor Electives.....	8		8	

• See p. 89 for General Studies requirements.
(See p. 171 for policy on Physical Education.)

SYSTEM SOFTWARE SCIENCE
(Bachelor of Technology Degree)

This program is designed to provide students with a background in computer system software in addition to the broad background in computing. Graduates are prepared to enter employment as Systems Programmers or System Software Specialists. Any relevant curriculum at RIT may be chosen as minor study.

NOTE:		QUARTER CREDIT			
F-FALL W-WINTER	S-SPRING SR-SUMMER	FW	s		
ICSS-200 Introduction to Computer Science ICSS-210 Introduction to Digital Computers..... ICSP-215 Programming Language..... ICSS-230 Discrete Structure..... SMAM-204 Modern Algebra..... SMAM-214 Introductory Calculus..... SMAM-309 Statistics..... • General Studies Electives (Lower Division)..... ^Physical Education Elective.....		4	4	4	FIRST YEAR
			4	4	
ICSP-305 Assembly Language Programming..... ICSP-306 Advanced Assembly Language Programming ICSS-320 Data Structure Computer Science Electives..... Minor Electives..... • General Studies Electives (Lower Division)..... ^Physical Education Elective.....		4	4	4	SECOND YEAR
			4	4	
ICSS-440 Operating Systems..... ICSS-545 Microprogramming..... Computer Science Electives..... Minor Electives..... • General Studies Electives (Upper Division).....		F/W 4		S/SR 4	THIRD YEAR
		4		4	
ICSS-575 Minicomputer Systems and Applications..... ICSS-580 Systems Programming..... ICSS-585 Systems Programming Laboratory..... Computer Science Electives..... Minor Electives..... • General Studies Electives (Upper Division).....		4		4	FOURTH YEAR
		4		4	
ICSS-525 Assemblers, Interpreters and Compilers..... ICSS-550 Computer Science Review..... Minor Electives..... Computer Science Electives.....		4		4	FIFTH YEAR
		8		8	
		2-4		2-4	

• See p. 89 for the General Studies Requirements.
 †See p. 171 for policy on Physical Education.

APPLIED SOFTWARE SCIENCE
(Bachelor of Science Degree)

This program is designed to provide students with a background in applied areas in computer software. Graduates are prepared to enter employment as applied software specialists, applications programmers, or research programmers.

NOTE: F-FALL S-SPRING W-WINTER SR-SUMMER	QUARTER CREDIT			
	FW		S	
ICSS-200 Introduction to Computer Science.....	4			FIRST YEAR
ICSS-210 Introduction to Digital Computers.....		4		
ICSP-215 Programming Language.....		4		
ICSS-230 Discrete Structure.....			4	
SMAM 251, 252, 253 Calculus.....	4	4	4	
Physics Electives.....		4	4	
* General Studies Electives (Lower Division).....	8		4	
^Physical Education Elective.....	0	0	0	
ICSP-305 Assembly Language Programming.....	4			SECOND YEAR
ICSS-320 Data Structures.....		4		
SMAM-305 Calculus and Mathematics Electives.....	4		4	
* General Studies Electives (Lower Division).....	4	4	4	
Science Electives.....		4	4	
Computer Science Electives.....	4	4	4	
^Physical Education Elective.....	0	0	0	
ICSS-440 Operating Systems.....	F/W		S/SR	
ICSS-530 Discrete Simulation.....	4		4	
Mathematics or Science Electives.....	4		4	
* General Studies Electives (Upper Division).....	5		5	
Computer Science Electives.....	4		4	
ICSS-545 Microprogramming.....	4			FOURTH YEAR
ICSS-575 Minicomputer Systems and Applications.....			4	
Mathematics and Science Electives.....	4			
* General Studies Electives (Upper Division).....	5		5	
Computer Science Electives.....	4		8	
ICSS-550 Computer Science Review.....			4	FIFTH YEAR
Computer Science Electives.....	6-8		2-4	
Free Electives.....	4		4	
* General Studies Electives.....	5		5	

*See p. 89 for the General Studies Requirements.
^See p. 171 for policy on Physical Education.

Department of Packaging Science

HAROLD J. RAPHAEL, *Director*

The Packaging Science program, first of its scope leading to the Bachelor of Science degree, is broadly interdisciplinary, providing educational opportunities for young men and women seeking careers in the multi-faceted packaging industry. Graduates are prepared for initial employment in such areas as management, sales, marketing, purchasing, creative design, structural design, product development, ecological considerations, and the technical and engineering phases of production.

Packaging is a \$26 billion industry exhibiting dynamic growth and providing employment for many thousands of men and women with wide ranging skills and expertise.

Until a few years ago, on-the-job training had seemed sufficient. Growth and diversity now has created a need for specifically qualified personnel that is acute and critical. The RIT program has been established to meet this need at the college level.

The degree program in Packaging developed because of a close and well-established relationship between the packaging industry and Rochester Institute of Technology over many years. The School of Printing, the School of Photographic Arts and Sciences, the Graphic Arts Research Center, the School of Art and Design and the College of Continuing Education have provided many courses and seminars in various aspects of packaging, as well as undertaking research projects to extend technical knowledge and applications.

Packaging has become increasingly related to total marketing concepts; it has even greater dependence upon new developments in materials and processes. Therefore, the industry requires management personnel with strong backgrounds in graphic arts, business, engineering, science and the creative dimension.

All of these educational disciplines are presently found in the departmental curricula of RIT. This interdisciplinary program synthesizes these existing and recognized strengths with additional offerings recommended by representatives of the industry.

CHARACTERISTICS OF THE PACKAGING PROGRAM

The program has these characteristics:

1. It is career oriented – the graduate is ready to enter directly a position of responsibility.
2. It is interdisciplinary – the student becomes familiar with the many facets of packaging through courses in several RIT colleges.
3. It is flexible – the program offers three options: management, design, and technical, with ample opportunity for electives according to interest.
4. It is representative of industry needs – the content developed with the assistance of the Rochester Area Packaging Association, consultants from the packaging industry, and educational specialists.
5. It is adaptable to the cooperative plan, used widely in other RIT programs.

FRESHMAN LEVEL

The four-year B.S. degree program considers for admission high school REQUIREMENTS graduates who meet the following requirements: English, 4 years; Mathematics, elementary algebra and either plane geometry or intermediate algebra; Science, 1 year. Candidates are evaluated in relation to career objectives, designated option, and other indications of potential success in the program. A portfolio is required of those students electing the design option.

ADMISSION

UPPER DIVISION (TRANSFER)

Transferring into the program with advanced standing is particularly advantageous, since RIT has had many years of experience in assimilating graduates of two-year colleges into its programs and moving them from this point in their education directly into a chosen career field. Some candidates now in four-year colleges will find in the packaging program a career opportunity with developing potential. Associate degree holders (A.A., A.S., A.A.S.) have courses arranged to meet the requirements of the program and to correct deficiencies resulting from work taken at other institutions not offering the courses required for graduation. With a selective choice of electives by students in the two-year colleges, it is possible to complete the packaging curriculum in two additional years at RIT.

NOTE: Since the Packaging Programs are interdisciplinary and provide great individual flexibility, it seems best at this time to indicate requirements by totals in the several disciplines rather than by year and quarter.

PACKAGING SCIENCE (B.S. Degree)		Courses Required	Quarter Hour Credits
PACKAGING (MANAGEMENTOPTION)		Management and Marketing	
		Economics	8
		Accounting	8
		Management Principles	4
		Human Relations	4
		Marketing Principles	4
		Two courses from the following:	
		Purchasing	
		Management Problems	
		Marketing Research	
		Advertising	
		Sales Management	
		Marketing Logistics	8 36
Courses Required	Quarter Hour Credits	Packaging	
		Introduction	2
		Principles	3
		Materials and Processes	4
		Equipment and Systems	4
		Environment and Testing	4
		Development—Marketing	
		Relations	4
		Senior Thesis	4 25
		Free Electives	16
		^Physical Education Electives	0
		Total Credits for degree	187
• General Studies Electives	54		
Mathematics—Science			
Algebra, Trigonometry	6		
Chemistry	12		
Engineering Materials	4		
Computer Techniques	8		
Statistical Quality Control	4 34		
Art and Design	6		
Printing			
Printing Processes	3		
Layout and Printing Design	3		
Copy Preparation	4		
Reproduction Photography	3		
Technical Writing	3 16		

160 PACKAGING SCIENCE PROGRAMS

PACKAGING (DESIGN OPTION)

Courses Required	Quarter Hour Credits
• General Studies Electives	44
Mathematics–Science	
Algebra	3
Contemporary Science	12
Engineering Materials	4
Computer Science	8 27
Art and Design	
Design I	15
Drawing	12
Industrial Design	
Applications	9
Introduction to	
Communications Design	9
Communications Design	18 63
Printing	
Printing Processes	3
Reproduction Photography	3
Technical Writing	3 9
Marketing	
Marketing Principles	4
Packaging	
Introduction	2
Principles	3
Materials and Processes	4
Equipment and Systems	4
Environment and Testing	4
Development–Marketing	
Relations	4
Senior Thesis	4 25
Free Electives	15
(Physical Education Electives	0
Total Credits for B.S. degree	187

PACKAGING (TECHNICAL OPTION)

Courses Required	Quarter Hour Credits
• General Studies Electives	54
Mathematics–Science	
Algebra	4
Calculus	6
General Chemistry	8
Organic Chemistry	12
Physics	12
Engineering Materials	4
Applied Vibrations	4
Statistical Quality	
Control	4
Computer Science	8 62
Printing	
Printing Processes	3
Layout and Printing	
Design	3
Copy Preparation	4
Technical Writing	3 13
Design	
Fundamentals of Design	6
Marketing	
Marketing Principles	4
Management	
Management Principles	4
Packaging	
Introduction	2
Principles	3
Materials and Processes	4
Equipment and Systems	4
Environment and Testing	4
Development–Marketing	
Relations	4
Senior Thesis	4 25
Free Electives	19
(Physical Education Electives	0
Total Credits for B.S. degree	187

• See p. 89 for General Studies requirements

(See p. 171 for policy on Physical Education

*Center for Community/Junior College Relations
Office of Faculty Development*

RICHARD L. RINEHART, *Director*

The Office of Community College Faculty Development offers graduate programs of study to meet the requirements of both prospective and currently employed two-year college faculty. Curricula stress breadth of knowledge in the field of specialization and allow an interdisciplinary graduate program directed at teaching in the two-year college. A teaching internship at a two-year college will be required of candidates lacking classroom experience. Essential background concerning the two-year college, its students, instructional techniques, and management of learning is provided by the Center's Community College Graduate Course Series.

A new graduate program in Instructional Technologies combines work in several disciplines in which RIT has a deserved reputation.

For further information, see separate RIT Graduate Bulletin, or contact the Director, Center for Community/Junior College Relations, Rochester Institute of Technology, One Lomb Memorial Drive, Rochester, New York 14623.



The National Technical Institute for the Deaf

D. ROBERT FRISINA, *Director*

WILLIAM E. CASTLE, *Dean*

The National Technical Institute for the Deaf was created to provide deaf students with the technological training that will lead to meaningful employment in business, industry, government and education. Public Law 89-36 authorized the establishment of NTID, and Rochester Institute of Technology was chosen as the sponsoring institution in late 1966 by the Department of Health, Education, and Welfare. In the fall of 1968, a pilot group of 70 deaf students began their studies at NTID and for the academic year 1973-74 total enrollment was approximately 450.

PART OF RIT

RELATIONSHIP OF NTID TO RIT

While NTID is a national institution, it also is an integral part of RIT as one of its eight colleges, and is governed by the RIT Board of Trustees. It is the first large-scale effort to educate deaf students on a college campus planned primarily for hearing students.

The fact that NTID is located on a regular college campus is seen as an important factor in the development of personal, social and communication competence of deaf students. Educational opportunities are available for deaf students on both a junior (Technical Education) and senior college (Advanced Programs) level. In addition to the Technical Education programs that lead to certificates, diplomas and associate degrees, many deaf students take RIT courses or are cross-registered full-time or part-time into the Advanced Programs (baccalaureate) of RIT.

CROSS REGISTRATION

An NTID student cross-registered in courses in any RIT college has the support services of interpreters, tutors, notetakers, speech pathologists, audiologists, and counselors available to him.

To enroll in the program of another college at RIT, the NTID student discusses the possibility with his counselor, academic advisor, and with the NTID educational specialist in the college of his choice. They review academic progress, aptitudes and interests. A recommendation is made and the final decision is left to the college in which the student seeks enrollment.

BENEFITS OF INTERACTION

The varied educational opportunities enable the deaf and hearing to learn together. The interaction of hearing and deaf extends to housing, sports and other social and community activities. Residence halls are available for single students, with on-campus apartments and townhouses for married students. There is a full intercollegiate sports schedule as well as intramural and recreational programs. Fraternities and sororities are active on campus along with professional and honorary societies, special interest clubs and service organizations.

The National Technical Institute for the Deaf



The entire educational program for NTID students is designed to help deaf students develop the technical skills and social awareness to compete in the hearing world of work.

THE NTID
COMPLEX

FACILITIES AND SERVICES

A new three-building complex is the site of the National Technical Institute for the Deaf. It is built on the campus of Rochester Institute of Technology. Deaf and hearing share facilities on campus.

The largest structure is an academic building. In it are classrooms, laboratories and shops, administrative offices, faculty and staff offices, a research and training center, a theater, a speech and hearing center and a student development area.

The residence hall contains dormitory rooms, recreation areas, student lounges, laundry rooms, baggage and storage areas, project areas, study areas and conference rooms.

The dining hall-commons building has a dining room and all the other facilities needed to provide food service. It also contains a mailroom and lounge.

All the buildings were designed for convenience and educational value to students, and look like the other buildings on the RIT campus which also are used in educating deaf students. The new complex enables NTID to make the classroom and housing area a living-learning experience.

PLAN OF
EDUCATION

NTID EDUCATIONAL PHILOSOPHY

The major objective of NTID is to provide qualified deaf students with technical education in science, business, engineering, and applied arts which will lead to well-paying and satisfying jobs.

Special support services at NTID are intended to help deaf students achieve personal, social and cultural growth and adjustment.

NTID also strives to learn as much as possible about methods of teaching the deaf. It is exploring new educational technologies which may help all deaf persons. Special training programs are designed to develop skilled instructors and other professionals to work with the deaf and to give NTID employees the opportunity to learn all methods of communication.

Certificate, Diploma, Associate Degree, and Baccalaureate Degree Programs are offered to NTID students.

SUMMER VESTIBULE
PROGRAMS

The Summer Vestibule Programs are a series of educational experiences designed to prepare deaf students for further post-secondary training; to determine academic strengths and weaknesses and to provide an environment for developing program and career choices.

During the summer program, new students will be enrolled in courses in English, mathematics, and science. They will have the opportunity to explore and evaluate, through Program Sampling, the various programs of study available through NTID. Concurrently, the faculty will have the opportunity to evaluate the students' abilities and interests and to offer counsel and planning for the Fall Quarter.

The counseling staff helps the student more fully understand his abilities, interests, and achievement level through the interpretation and discussion of test data, background experiences, and work values. Aptitudes and interests are then related to available academic programs and possible occupations. This gives the student the opportunity to select a program and career which best suits his individualized needs. The staff is also available for assisting the student to make satisfactory adjustments to college life and developing interpersonal relationship skills. The students are also guided through a series of specially designed living arrangements and self-governance experiences. This program has proven invaluable in preparing students to participate in the collegiate environment.

The Division of Technical Education offers deaf students many Certificate, Diploma and Associate Degree programs in the sciences, technologies and applied arts. These programs give deaf students the technical and social skills needed for employment and improvement on the job. The programs are organized to meet the needs of industry and the demands of a particular job. Most Diploma and Associate programs offer a cooperative work experience.

The length of time a student spends in any program depends on the time it takes to learn technical skills.

Job placement services also are available to deaf students. Each student is assisted in finding a job. Personal interests and technical and social skills are important in job placement.

The division has seven departments: Visual Communications Technologies, Technical Science, Engineering Technologies, Business Technologies, Technical English, Technical Mathematics, and Occupational Liaison and Research.

The Certificate, Diploma, and Associate Programs offer technical education to students aspiring toward occupations which do not require baccalaureate degrees. A plan for the technical education of most students will be formulated during the Summer Vestibule Programs or at the point of entry into NTID.

Technical Education curricula for NTID include the following:

Business Technologies:

1. A Certificate in Office Practice and Procedures
2. A Certificate in Data Processing
3. A Diploma in Office Practice and Procedures
4. A Diploma in Data Processing
5. A Diploma in Accounting Technology
6. An Associate in Applied Science in Office Practice and Procedures
7. An Associate in Applied Science in Data Processing
8. An Associate in Applied Science in Accounting Technology

Engineering Technologies:

1. A Diploma in Architectural Drafting
2. A Diploma in Machine Tool Operation
3. A Diploma in Numerical Control Programming
4. A Diploma in Electronics
5. A Diploma in Industrial Drafting
6. An Associate in Applied Science in Architectural Technology
7. An Associate in Applied Science in Civil Technology
8. An Associate in Applied Science in Electromechanical Technology

DIVISION OF
TECHNICAL
EDUCATION

Technical Science:

1. A Certificate for Histologic Technicians
2. A Certificate for Physician's Office Technicians
3. A Diploma for Hematology Technicians
4. A Diploma for Microbiology Technicians
5. A Diploma for Clinical Chemistry Technicians
6. A Diploma for Medical Record Technicians
7. An Associate in Applied Science for Medical Record Technicians
8. An Associate in Applied Science for Medical Laboratory Technicians

Visual Communications Technologies:

1. A Certificate in Applied Photography
2. A Diploma in Applied Photography
3. A Diploma in Printing Technology
4. A Diploma in Applied Art
5. An Associate in Applied Science in Applied Photography
6. An Associate in Applied Science in Applied Art

Baccalaureate Degree Programs – Through the various other colleges of RIT, qualified NTID students are able to pursue any of the major study areas available to hearing students. These areas are described in detail throughout this catalog. Admission to these programs is dependent upon the demonstrated abilities of the individual student.

SPECIAL
SUPPORT SERVICES

Special support services are provided to the NTID student. Interpreter services are available where required for any class in which one or more deaf students are in attendance. In many classes for baccalaureate programs, hearing students—on a voluntary basis—take notes on special notetaking pads and give copies of them to NTID students.

In addition, counseling and speech and hearing services are conducted on an individual basis for each NTID student. Services to assist in career development and social and cultural development are an important part of the total NTID program. All special support services are geared toward helping the deaf student gain the maximum benefit from his educational experiences at NTID, experiences that will lead to meaningful employment.

Social-Cultural Development – The Department of Social and Cultural Development at NTID supports cooperation between NTID and all non-academic departments of RIT. These areas include student activities, the College Union Board, housing, health, physical education and religious activities.

NTID students are informed of educational and social activities at RIT or in the Rochester community. The department also schedules special events for deaf students and arranges for student interpreters at all activities where needed.

An activity of the department is coordinating a volunteer service program for deaf students. Volunteers have been placed in hospitals, welfare agencies, nursing homes and local public schools.

A file folder for each student is kept in a convenient place so that phone messages and other communications may be received.

Student Activities — Many activities on campus provide deaf students with a variety of out-of-class experiences.

Such activities as athletics, student newspaper, student government, and clubs are not only fun, but give many deaf students the opportunity to become leaders.

One of the most active groups on campus is the NTID Drama Club. Throughout the year a troupe of deaf students presents a variety of plays and skits for both hearing and deaf audiences.

In addition to intra mural athletics, deaf students may also be members of RIT varsity teams in intercollegiate competition. Deaf athletes have helped RIT to winning seasons in hockey, track and swimming. There are many NTID students with an interest in all sports.

NTID students annually elect a member to the RIT Policy Committee. There a student has the chance to help make decisions that will affect the future of all students. Additionally the deaf students have organized the NTID Student Congress as a subsidiary to the RIT Student Association.

Admission to NTID is based on each student's potential to finish a program of study which will give him the skills to get a good job.

ADMISSION

The NTID programs are designed for students who have finished the educational program in their home community which meets their learning needs, in the opinion of school authorities, counselors and others who know the student; this may include students who have not finished the usual 12 years of school but who can profit from the NTID program. Generally, it is expected that students now enrolled in public or private secondary school programs serving the deaf will take advantage of the possibilities for education and training that these programs may have for them.

The cost of attending the National Technical Institute for the Deaf includes tuition, room, board, and academic fees. For more specific information on admission, costs, and programs please consult the separate NTID Catalog.

CHARGES AND FEES

Information on costs or financial assistance may be requested by writing:

Coordinator of Vocational
Rehabilitation Affairs, NTID
Rochester Institute of Technology
One Lomb Memorial Drive
Rochester, New York 14623

Career Decision Program

RIT has always offered unique opportunities for beginning specialized professional studies in the early part of a student's college program. In the Career Decision Program a student who is not yet certain of his or her college major takes special courses for career exploration and at the same time gets career counseling.

OBJECTIVES

Students in this program explore one or more specialized career fields, at the same time obtain a year of college credit, receive individualized professional career guidance, and keep several career options open.

The basic objective of the Career Decision Program is to enable a student to make a sound career choice by the end of his or her first year of college.

THE PROGRAM

A student enrolls in one, two, or three general studies courses, such as Modern American History, Effective Composition, or Introduction to Psychology. In addition, each student enrolls in specialized course work in any of the colleges of RIT including the College of Continuing Education, in one or more of the following fields:

Accounting	Criminal Justice	Photography
Art	Engineering	Photographic Marketing
Biology	Food Administration	Photographic Processing
Business	Mathematics	Physics
Chemistry	Medical Technology	Printing
Computer Systems	Nuclear Medicine Technology	Retailing
Crafts	Packaging	Social Work

With the guidance of his or her assigned counselor in the Counseling Center, each student is required to complete a *written study* of his or her tentatively chosen career field. At the end of the first, second, or third quarter the student applies for admission to one of RIT's specialized departments or to some other college. Acceptance into that chosen program, of course, depends upon the student's meeting the requirements and standards of that program, and upon availability of space in that program. In some instances, completion of a bachelor's degree program under this plan may require additional time, but the program provides a unique combination of opportunities for career exploration and intensive individual guidance. By special permission, a student may enroll for portions of this program on a part-time basis.

College Restoration Program

The College Restoration Program is a specialized program of instruction for students who have experienced probation or dismissal from college for academic reasons. After being accepted into the program, the student is classified for one academic quarter as a special restoration student of the RIT College of General Studies and pursues an individualized program designed in cooperation with the Counseling Center and the Reading and Study Clinic.

The entire program is designed to strengthen the student's self-motivation, self-discipline, and self-confidence. Successful completion of this special program should qualify the student to apply for readmission to the college or department of his choice, or to seek some other type of educational programming to achieve his vocational career. Participation in the College Restoration Program cannot guarantee that a student will be readmitted to his former college or department or admitted to a school where he might wish to transfer; however, periodic reports of student progress are made to parents, and professional resumes of student achievement in the program are sent to colleges upon request of the student or college.

Once the results of the *Educational Diagnosis* have been analyzed, and it has been determined that the College Restoration Program can be helpful, an individual program is planned. The student will participate in the activities of the program for approximately seven hours a day, five days a week, for ten weeks. The content of the program depends upon the student's needs and his rate of progress during the program, but it will probably include the following areas:

College Course – Each student in the College Restoration Program may enroll for one or more courses in the Institute's regular offerings. Selection of the courses shall be under the strict guidance of the Counseling Center.

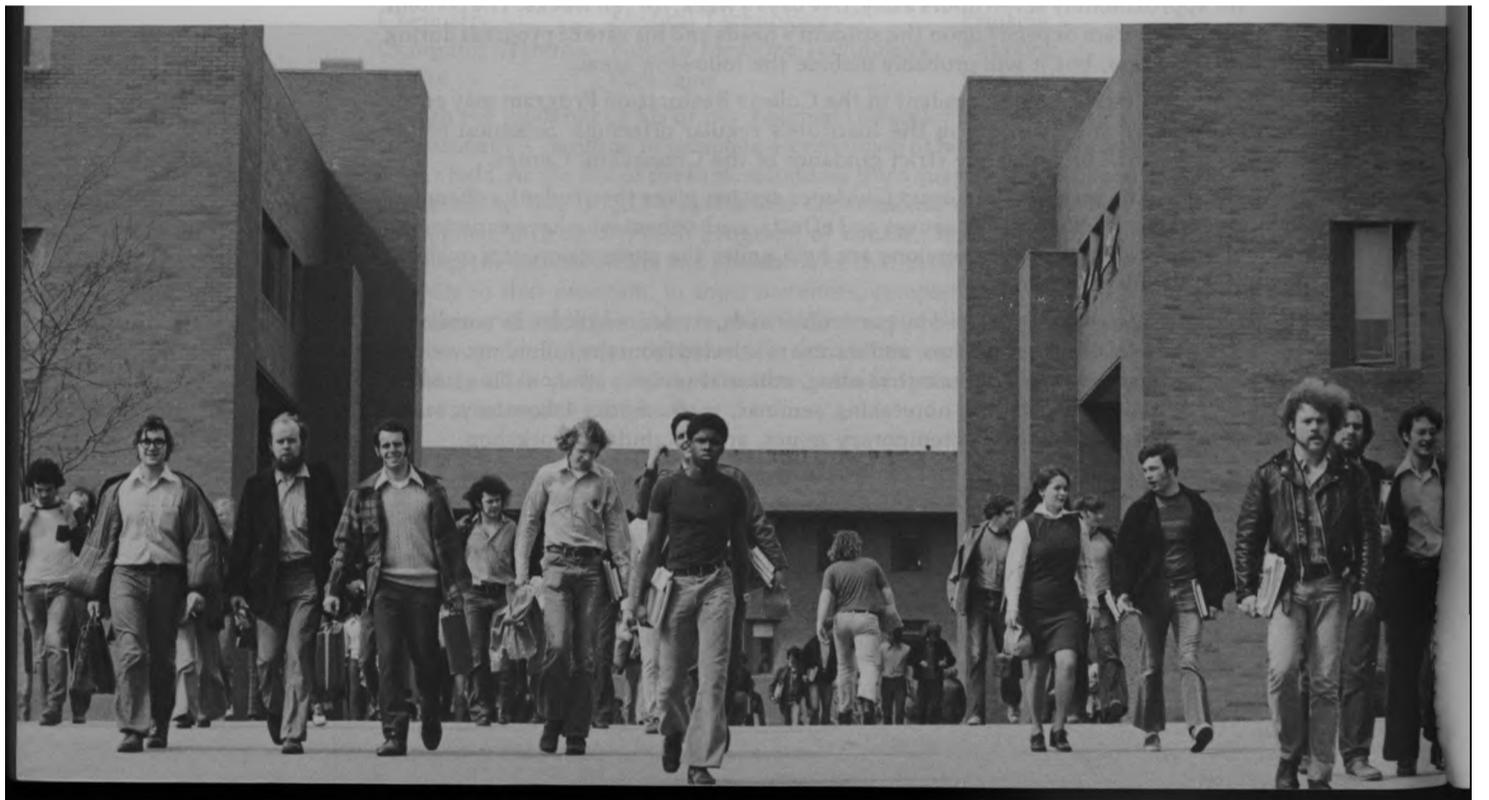
Group Guidance – The Group Guidance session gives the student a chance to discuss his problems, their causes and effects, with others who have experienced similar problems. These sessions are held under the supervision of a qualified group leader.

Other Courses – As defined by particular needs, students will also be enrolled in a block of laboratories, classes, and seminars selected from the following: writing lab, efficient thinking, efficient reading, editorial review, study skills seminar, book discussion, listening-notetaking seminar, mathematics laboratory, scientific concepts seminar, contemporary issues, and vocabulary workshop.

HEOP Program

The Higher Educational Opportunity Program offers support for educationally and economically disadvantaged students. Jointly funded by RIT and the State Education Department, this program tries to lessen the economic burdens of going to college and to give direct counseling, tutoring, and skill-improvement for New York State students who qualify.

Students in this program enroll in regular RIT courses as full-time students, but have two kinds of academic support. In the summer before their first year at RIT they usually enroll in one General Studies course and have intensive counseling and skill support in writing, study skills, and mathematics. Secondly, their counselors have very close contact with them, their professors, and some staff and administrators throughout their program at RIT. Overall, students in this program do as well academically as the average RIT student, despite their initial disadvantage. And most of them stay at RIT until they earn a degree—over 83% since the program began. The HEOP program here has been steadily growing since it first began. For further information, contact the Director, Higher Education Opportunity Program.





Department of Physical Education and Athletics

LOUIS A. ALEXANDER, JR., *Director*

The Physical Education Program at RIT provides diversified physical and mental activities presented in a wholesome atmosphere leading toward physical, mental, and social development. Through exercise, care and protection of the body, an individual can maintain good health and physical fitness by using his body efficiently and effectively during work, play, and rest, throughout his life.

Physical Education – The Physical Education Program consists of a variety of individual, dual, and team activities designed to meet the needs and interests of all college students. The program is designed to allow each student to choose activities he or she will enjoy.

For the Baccalaureate Degree – All candidates for the Baccalaureate degree enrolled through the Day Colleges must successfully complete six quarters, or the equivalent of two years, of Physical Education. This requirement is normally met during the first and second year of matriculation, but may be done at any time.

For the Associate Degree – All candidates for the A.A.S. degree enrolled through the Day Colleges are required to successfully complete three quarters, or the equivalent of one year, of Physical Education. This requirement is normally met during the first year of matriculation, but may be done anytime.

Transfer Students – All students who transfer into RIT from any other college or university also must comply with the Physical Education requirements for the Associate and Baccalaureate degree, either at RIT or as transferable credit.

Exception: Transfer students who have earned an Associate's degree from another institution, and who are required to complete a cooperative work-study assignment, are required to complete only three quarters, or the equivalent of one year, of Physical Education at RIT or as transferable credit.

REQUIREMENT
FOR DEGREES

172 PHYSICAL EDUCATION

Activities from which a student may select are listed below.

Bowling	Rifle Shooting
Beginner's Scuba Diving	Body Building
Advanced Scuba Diving	Weight Lifting
Horseback Riding	Golf
Skiing	Volleyball
Tennis	Beginning First Aid
Basketball	Advanced First Aid
Softball	Gymnastics
Touch Football	Archery
Wrestling	Ice Skating
Beginning Skeet and Trap Shooting	Ice Hockey
Advanced Skeet and Trap Shooting	Modern Dance
Roller Skating	Beginning Judo
Swimming	Advanced Judo
Life Saving	Baseball Coaching Seminar
Water Safety Instruction	Fishing
Yoga	Hunting
Karate	Folk and Square Dancing
Frisbee	Water Polo
Jogging	

Athletics — Regular RIT intercollegiate schedules include football, soccer, cross country, basketball, wrestling, fencing, hockey, swimming, track and field, baseball, tennis, golf, lacrosse and rifle.

An amendment to ECAC rules now permits women to participate on varsity teams.

Intramural and recreational activities for men are touch football, basketball, volleyball, badminton, table tennis, bowling, swimming, tennis, softball, billiards, fencing, golf, archery, and soccer.

Intercollegiate and intramural activities for women include field hockey, basketball, volleyball, swimming, bowling, softball, fencing, tennis, and golf.

Both men and women are eligible to compete for positions on the cheerleading squad.

The athletic program is financed by an Athletic Fee which every full-time undergraduate student pays. Part-time, special, and graduate students also pay this fee if they wish to attend games and participate in the program.

The Institute belongs to a number of national, regional, and local athletic associations such as the National Collegiate Athletic Association, the Eastern College Athletic Conference, the Independent College Athletic Conference, the Finger Lakes Hockey League, the Northern Division Lacrosse Association, the North Atlantic Fencing Conference, the Inter Collegiate Women's Fencing Association, and abides by all the policies, rules, and regulations of these associations.

Reserve Officers' Training Corps

LIEUTENANT COLONEL RAYMOND F. HUMPHREY, *Professor of Military Science*

The general objective of the Reserve Officers' Training Corps is to produce junior officers who, by their education, training, attitude, and inherent qualities, are suitable for continued development as officers in the United States Army.

The intermediate objectives of the program are to develop in each student:

- (1) The fundamentals of self-discipline, integrity, and responsibility;
- (2) An appreciation of the role of a participating citizen in matters dealing with national defense;
- (3) The ability to evaluate situations, to make decisions, to understand people, and to practice those attributes considered essential in a leader.

Two Year Program – The Army R.O.T.C. program at Rochester Institute of Technology is voluntary and is open to all male and female students enrolled on a full-time basis.

PROGRAMS

The Two-Year program is offered to all qualified male and female students with two school years remaining who did not previously participate in R.O.T.C. Students in this program attend a six-week basic summer camp between their Sophomore and Junior years, in lieu of the first two years of R.O.T.C. normally presented in the classroom. Upon successful completion of this basic camp, the student is enrolled in the Advanced Course for the last two years. It should be noted that interested students should begin processing applications for this program early in the Sophomore Year.

Four Year Program – The Four-Year Program must be selected by Freshmen at the beginning of their first year. In this program, the student attends R.O.T.C. classes during Freshman and Sophomore years. Upon completion of the Sophomore year, the student may request enrollment in the Advanced R.O.T.C. Course for the Junior and Senior years.

In both the Two-Year and Four-Year Programs, the student must successfully complete all degree requirements; must also attend an Advanced summer camp, usually between Junior and Senior year, prior to receiving the commission as a Second-Lieutenant on graduation day.

Throughout the entire program, the R.O.T.C. student is provided a uniform, Army textbooks and related materials free of charge. In addition, those in the Advanced Course receive \$100.00 a month during the school year.

The R.O.T.C. Vitalization Act of 1964, as amended by legislation in 1971, provides financial assistance in the form of R.O.T.C. scholarships for selected students. Under this program, the Army pays for all tuition fees, lab fees, textbooks, and other required expenses, except room and board. In addition, the student receives \$100.00 per month for the duration of the scholarship. It also sponsors many extracurricular activities through which the cadet may find an opportunity to develop leadership potentialities and broaden overall cultural, civic and social background.

SCHOLARSHIPS

Instructional Research and Development

RICHARD D. ZAKIA, *Director*

WILLIAM F. LEHMAN, *Associate Director*

The broad goal of IRD is best described by the June 1972 Carnegie Commission report on higher education, "The Fourth Revolution."

"The enrichment and improvement of the conditions in which human beings learn and teach achieved through the creative and systematic organization of resources, physical arrangements, media and methods."

In pursuit of this goal Instructional Research and Development (IRD) continually looks at the way we teach and the way we learn, and supports both faculty and students in a common pursuit—learning. It searches out new methods and technologies for teaching, and assists in blending them to our existing learning environment. IRD, which is located in the Wallace Memorial Library, includes the Television Center and the Media Design Center.

TELEVISION CENTER

The Television Center offers the faculty the opportunity to provide flexibility in class scheduling through the use of televised instruction. A professional staff of producer/directors along with graphic artists and engineers exists to aid the individual instructor in the development of complete courses or modules for use within a course. The Center has a wide variety of video cameras and recorders available including the small one camera portable units, a two camera unit for use in remote location programs, and two fully equipped studios with three camera capability. Thus, the utmost in flexibility is available to meet the instructional needs of the Institute. All standard video tape formats are available from two inch broadcast to half inch and video cassette.

The Television Center provides distribution of programming over a cable television system that reaches all academic, administrative and residence areas. An Instructional Television Fixed Service (ITFS) transmitting facility links the Institute to other locations, both academic and governmental, throughout the county via micro-wave. A master antenna (MATV) system is operated in conjunction with the closed circuit cable to provide local broadcast stations (television and FM radio) to faculty and students.

The Television Center maintains a large library of video tapes on a wide variety of subjects and has access to video tape libraries throughout the country.

MEDIA DESIGN CENTER

The Media Design Center provides for the faculty services in the design, development, production and evaluation of mediated visual and audio materials for instruction. The professional staff of producers, directors, photographers, and artists also act as advisors to the faculty in developing innovative, more effective instructional strategies.



The Media Design Center and Television Center provide two levels of services:

1. General Services to meet the daily routine needs of the Institute faculty;
2. Producer Services to aid the faculty in the development of more sophisticated mediated instruction.

In addition, consultation and advisement is provided in the selection, purchase and use of television, photography, cinematography, animation, graphics and audio.

Additional Services

- SUMMER SESSION** During the summer, many opportunities for taking courses are available to the student, both day and evening. Those with the necessary prerequisites may enroll in the regular Summer Quarter courses described in this catalog. Students interested in undergraduate or graduate credit may enroll in the appropriate session: Summer Quarter, Summer Day or Summer Evening. Other courses offer high school students and adults opportunities to explore college subjects.
- The Summer Session provides opportunities for students to accelerate their diploma or degree programs, to decrease the number of courses required during the regular school year, to enhance skills in a particular area of study, or to repeat a course which they have failed.
- For further information call or write Director, Summer Session.
- EXTENDED SERVICES** This very active division of the College of Continuing Education offers a multitude of programs for professional development and for service to community groups.
- For further information, call or write Director, Extended Services.
- OFFICE OF SPECIAL EVENTS** This office makes arrangements for those events not directly related to academic programs where campus facilities are used.
- For information, phone Director, Special Events, 464-2346.
- COUNSELING CENTER** In addition to providing counseling services for RIT students, the Counseling Center offers career counseling for individuals and personnel selection services for industrial firms. A brochure describing services and fees may be obtained by telephoning or writing the Director, Counseling Center. See page 168 for further description.
- READING AND STUDY CLINIC** The Reading and Study Clinic offers individual or group instruction to help RIT students improve their reading efficiency, study techniques, vocabulary mastery, effective listening and critical thinking abilities, mathematical understandings, computational skills, writing competence, and general ability to use the English language. In cooperation with the Counseling Center, the Reading and Study Clinic will also counsel, diagnose, and correct or develop basic academic skills of students not working up to capacity or whose achievement records are unsatisfactory.
- In addition to these programs, the Clinic provides individual tutoring in most college-level courses, a College Restoration Program (described on an earlier page) a specialized instructional program for students who have realized academic difficulty or dismissal from college. Information from Director, Reading and Study Clinic.



In this section you will find Course Descriptions for all course offerings given by the Day Colleges, Schools and Departments of the Institute for *undergraduate credit*. The listing does not include courses provided by the College of Continuing Education, nor those courses specifically for graduate degree programs. These are described in the separate Continuing Education Catalog and the Graduate Catalog.

The order of listing is as follows:

1. College of Business
2. College of Engineering
3. College of Fine and Applied Arts
4. College of General Studies
5. College of Graphic Arts
and Photography
6. College of Science
7. Institute College:
 - Computer Science
 - Packaging
 - Applied Science

An explanation of course numbering is on the next page.

RIT Universal Course Numbering System

In addition to its title, each academic course offered by RIT is identified by a specific four letter and three digit number. This new system has been adopted to:

1. Make it easier to find a given course, directory style, in whatever college, school or department it is offered;
2. Make it easier, especially in choosing electives, to develop individualized programs through the several colleges of RIT;
3. Make record keeping and retrieval more efficient.

As shown in the example below, each letter and digit has significance:

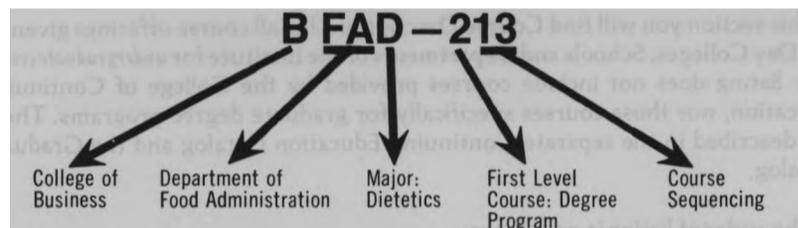
First letter: College offering the course

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 and 5 = Upper Level Undergraduate Degree
Courses; 6, 7, or 8 = Courses for Graduate Credit)

Second and Third numbers: Course differentiation and sequencing



Course Descriptions

All Course Descriptions are arranged for easy use, directory style, by colleges, schools and major departments. Any course shown in the Program Outlines of the several colleges can be found by its alphabetical sequence (and within this alphabetical order, by its numerical sequence) in the Course Description section.

Course numbers in parentheses at the end of a course description are prerequisites for that course.

180 COURSE DESCRIPTIONS / BUSINESS MANAGEMENT

BBUA-554 Seminar in Accounting
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/Qtr. (Maximum 12 cr. allowed)

MANAGEMENT

BBUB-201 Management Concepts
A basic course in management theory and practice. The student is introduced to the application of the behavioral sciences and quantitative methods. 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
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
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
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
Application 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. (Senior Standing)
Class 4, Credit 4

BBUB-407 Technical Society and the Legal Environment
Social influences and innovation, role of the manager, role of profits, legal influences of government, and the manager's continuing problem of balancing conflicting demands. (BBUB-201)
Class 4, Credit 4

BBUB-434 Operations Management
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
Acquaints the student with the characteristics and impact of the multinational 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 4

BBUB-531 Labor Relations
Past and present of the American labor movement. Union philosophy and objectives, issues and approaches are discussed. (BBUB-201)
Class 4, Credit 4

BBUB-534 Purchasing
Industrial purchasing; the organization of the function; the methods of procurement; purchasing policies; sources of supply; and legal aspects of purchasing.
Class 4, Credit 4

BBUB-535 Planning and Decision Making
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

182 COURSE DESCRIPTIONS / FINANCE / MARKETING

FINANCE

BBUF-441 Financial Management
A management oriented approach to the finance function of the corporation. Application of decision making techniques in planning for the procurement and distribution of capital, directing its use, and evaluating management's action in providing a return on the firm's investment. (BBUA-210, GSSE-302)
Class 4, Credit 4

BBUF-502 Money and Capital Markets
Analysis and description of the money and capital markets, secondary distributions, and government issues. (BBUE-381)
Class 4, Credit 4

BBUF-503 Financial Problems
The analysis of financial problems and application of decision making techniques to the operation of the firm. (BBUF-441)
Class 4, Credit 4

BBUF-504 International Finance
The balance of payments. Foreign exchange rates and markets. Gold standard. Flexible exchange rates system. International capital movements. Exchange restrictions. International monetary experiences. (BBUE-381)
Class 4, Credit 4

BBUF-507 Security Analysis
Analysis of classes of securities and issues. Description of the stock market and its operations. Derivation of value by quantitative techniques. (BBUF-441)
Class 4, Credit 4

BBUF-508 Portfolio Management
Analysis of fundamental criteria involved in the construction and management of securities portfolios. Theory of yield and policies of financial institutions. (BBUF-507)
Class 4, Credit 4

BBUF-510 Financial Institutions
Analysis of the factors influencing private financial institutions and their effect on the economy. Relationship of the Federal Reserve and Treasury Department to private financial institutions. (BBUE-381)
Class 4, Credit 4

BBUF-554 Seminar in Finance
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
Specific topics covered include understanding consumer behavior, product policy and planning, pricing institutions and channel, logistics advertising, personal selling and sales promotion, market research, international marketing, organization and controlling marketing activities. (BBUA-210, GSSE-302)
Class 4, Credit 4

BBUM-510 Consumer Services Analysis
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 organization; organizational concerns; and external environmental variables affecting consumer service industries. (BBUM-263)
Class 4, Credit 4

BBUM-511 Consumer Services Seminar
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

COURSE DESCRIPTIONS/MARKETING 183

BBUM-550 Marketing Management Problems

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

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-352or BBUQ-411)

Class 4, Credit 4

BBUM-552 Advertising

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

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

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

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

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

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-291, 292 Mathematics I, II

The mathematical background required for the increasing use of quantitative methods in management. Topics include set theory, 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

Interpretation and application of statistical techniques in business, to develop the ability to evaluate the results of statistical research as presented in professional literature and government and business reports; and to develop an understanding of how statistical inference may be used as one method of evaluation for managerial decisions. (BBUQ-291)

Class 4, Credit 4

184 COURSE DESCRIPTIONS / DIETETICS

BBUQ-353 Statistics III
An introduction to Bayesian decision theory, including discontinuous prior and posterior probability functions, regret functions, the value of sample information, and normal prior and posterior functions. (BBUQ-352 or permission of instructor)
Class 4, Credit 4

BBUQ-410 Quantitative Methods I
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
Statistical probability theory, regression and correlation, hypothesis testing, estimation and non-parametric techniques. (BBUQ-410)
Class 4, Credit 4

BBUQ-481 Mathematics
Applications of quantitative methods in business decisions: linear and quadratic optimization techniques, using precalculus mathematics. Computer demonstrations will be used where possible. (BBUQ-352 or BBUQ-411)
Class 4, Credit 4

FOOD ADMINISTRATION/TOURIST
INDUSTRIES MANAGEMENT

DIETETICS

BFAD-213 Nutrition Principles
The study of specific nutrients and their functions; physiological, psychological and sociological needs of man 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-212)
Class 4, Credit 4

BF AD-519 Educational Principles and
Methods
Principles of learning; behavioral objectives, motivation, perception, evaluation, guidance, teaching methods and audio-visual techniques. Development of a teaching/learning unit for a specific group.
Class 4, Credit 4

BFAD-531 Advanced Nutrition
Biological metabolism and interrelationships of nutrients, enzymes, and other biochemical substances in humans. Etiology, symptoms, treatment and prevention of nutritional diseases; evaluation of nutritional status. Classical and recent research in each area. (BFAD-213, SCHB-301, SBIG-212)
Class 4, Credit 4

BFAD-533 Diet Therapy
Role of diet and dietetics in metabolic, gastrointestinal, renal, musculoskeletal, cardiac, endocrine, febrile, and other diseases. (BFAD-213, SBIG-212)
Class 4, Credit 4

BFAD-535 Nutrition Seminar
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-531, BFAD-533) Open to senior students only.
Class 4, Credit 4

BFAM-211, 212 Food Principles
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. 2, Credit 4

BFAM-310 Mankind in Search of Food
Survey of foods including composition of foods, basic principles of nutrition, digestion, food spoilage, food poisoning, modern food processing, "health foods", world food problems and their possible solutions. 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** **Equipment in the Hospitality Industry**
 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-212)
 Class 3, Lab. 2, Credit 4
- BFAM-312** **Food and Beverage Purchasing**
 Fundamental purchasing principles and applications in current procurement methods. Inventory records and food and beverage cost control. Specific methods for buying food products and beverages, considering specifications and factors affecting quality. (BFAM-212)
 Class 4, Credit 4
- BFAM-313** **Quantity Food Production Management**
 Application of standards, principles and techniques of food preparation to quantity production of high quality food. Evaluation of tools and controls of production based upon scientific, technological, economic and social factors. Emphasis on standardization, work simplification, planning, scheduling, and service. Special projects in planning menus as a basis for production scheduling; labor costing and control. (BFAM-311, 312)
 Class 2, Lab 6, Credit 4
- BFAM-314** **Sanitation and Safety in 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-212, 311)
Class 4, Credit 4
- BFAM-411** **Management Problems**
 Analyzing and solving problems encountered by management in planning, organizing, directing, coordinating, and controlling the activities of a food service institution. Approaches to problem solving include solutions of authorities in the field and readings in literature: journals, books, case studies. (BBUB-201, BBUB-401)
 Class 4, Credit 4
- BFAM-415** **Food Science I**
 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, SCHG-216)
 Class 2, Lab 6, Credit 4
- BFAM-416** **Food Science II**
 Individual study concerning chemical and physical reactions in foods; the influence of kind and proportion of ingredients. Special emphasis on experimental design for problem solving and on written and oral communication skills. (BFAM-415)
 Class 2, Lab 6, Credit 4
- BFAM-422** **Hotel/Motel Management**
 A study of methods, techniques, and tools of management used in the development and operation of hotels and motels. Ethics and policies.
 Class 4, Credit 4
- BFAM-423** **Management Systems for the Hotel/Motel Industry**
 Front office procedures, accounting principles and systems as applied by management in organization and operations, guest room salesmanship; actual "on-the-job" applications. (BFAM-422)
 Class 4, Credit 4
- BFAM-425** **Introduction to the Tourist Industry**
 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

186 COURSE DESCRIPTIONS / FOOD / RETAILING

BFAM-511 Food Merchandising
Management experience in planning, organizing and supervising preparation and service of food for special occasions. Emphasis on determining needs of clientele. Effective use of time and materials. Evaluation of management experience by the preparation of operations reports. (BFAM-313)
Class 2, Lab 8, Credit 4

BFAM-517 Ethnic Foods
Study of regional and international foods and food customs of peoples of various backgrounds.
Class 4, Credit 4

BFAM-555 Research Problems
Independent study of research problems in food and hospitality management. Open to senior students only.
Class and Credit Variable

BFAM-554 Seminar in Tourist Industries Management
Selected management problems associated with hotels, motels, and resorts. Topics such as information systems, executive development, property management, long range planning or other current management concerns will be covered. (Permission of instructor)
Class 4, Credit 4/Qtr. (Maximum 12 credits allowed)

SCHOOL OF RETAILING

BRER-211 Retail Organization and Management
Three major areas will be covered: physical distribution, goods and services, and communications. Physical distribution covers selection of store locations, movement of inventory, and other facets of distribution. Goods and services includes classifications of merchandise, problems connected with securing and pricing merchandise, customer services for shopping convenience. Communications includes sales promotion and public relations.
Class 4, Credit 4

BRER-212 Merchandising
Basic buying principles applicable to retailing. Includes the buying organization, its working relationship with all company divisions and a comprehensive study of merchandising mathematics with application to terms and datings, stock turnover, and merchandise control.
Class 4, Credit 4

BRER-215-216 Research Problems
Senior project in selection, investigation, and critical study of a research problem. Problems utilized are those presented by business firms and topics of special interest to students.
Class 4, Credit 4/Qtr.

BRER-511 Basic Textiles
Analysis of textile fibers, weaves, and fabrics. Methods of printing, dyeing, and finishing. Study of the laws and regulations concerning labeling and advertising. Information for retail buyers to judge and to evaluate fabrics.
Class 4, Credit 4

BRER-512 Fashion Fabrics
Evaluation of fashion fabrics for selection of suitable fabrics for men's, women's, and children's clothing. Knowledge necessary for merchandising fashion goods.
Class 4, Credit 4

BRER-513 Home Furnishing Fabrics
Evaluation of home furnishing fabrics, draperies, curtains, rugs, and other household fabrics. Factors on serviceability, suitability, fashionability, and care. Knowledge necessary for planning decor.
Class 4, Credit 4

BRER-521 Fashion History
Survey of the apparel arts from ancient times to the present. Study is made of the social, political, and economic factors influencing styles of apparel throughout the ages and how history influences fashion today.
Class 4, Credit 4

College of Engineering

Course Descriptions

ELECTRICAL ENGINEERING

EEEE-351, 352, 353 Circuit Analysis I, II, III
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, SPSPG-207 and concurrent with SMAM-305, 306)
Class 3, Lab. 3, Credit 4

EEEE-430 Linear Systems
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-352 and EEEE-353 concurrently)
Class 4, Credit 4

EEEE-441, 442 Electronics I, II
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-353)
Class 3, Lab. 3, Credit 4

EEEE-461, 462 Electrical Engineering I, II
A course for non-electrical engineering majors. Circuit analysis, electronics, machines, switching circuits, logic and the elements of communication. (SPSPG-207, SMAM-306)
Class 3, Lab. 3, Credit 4

EEEE-471, 472 Electromagnetic Fields I, II
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-531 Electromechanical Energy Conversion
A development of the basic relationships of field energy, magnetic force, torque and generated voltage in an electromechanical device. Expansion of these fundamentals into an understanding of the operational characteristics of the electrical machine. (EEEE-353)
Class 3, Lab. 3, Credit 4

EEEE-613 Intro. Classical Controls
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
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
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-442)
Class 3, Lab. 3, Credit 4

COURSE DESCRIPTIONS / ELECTRICAL ENGINEERING 189

TECHNICAL ELECTIVES

EEEE-532 Electrical Machines I
The design and operating characteristics, both static and dynamic of transformers and synchronous and induction machines. (EEEE-471,353)
Class 3, Lab. 3, Credit 4

EEEE-590 Thesis
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
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 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
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 beam-forming. (EEEE-472)
Class 3, Lab. 3, Credit 4

EEEE-650 Introduction to Logic and
Switching
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-665 Digital Computer Workshop
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. (TCSP-205 or TCSP-220)
Class 3, Lab. 3, Credit 4

EEEE-670 Introduction to Microelectronics
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 Microelectronics Design
An electronic design course utilizing the media 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-643, EEEE-670)
Class 3, Lab. 3, Credit 4

EEEE-673 Applied Electronic Design
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
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-611)
Class 4, Credit 4

190 COURSE DESCRIPTIONS / ELECTRICAL ENGINEERING

EEEE-679 Active and Passive Filters
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-684 Nonlinear Control Systems
An introduction to the physical nature and mathematical theory of nonlinear control system behavior, including piece-wise linear analysis, describing function methods, phase-plane techniques, perturbation theory, and Liapunov's theory of stability. (EEEE-612)
Class 4, Credit 4

EEEE-687 Power System Analysis
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, EENG-202)
Class 4, Credit 4

EEEE-693 Digital Data Communications
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-634)
Class 4, Credit 4

EEEE-695 Introduction to Audio Engineering
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
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

INDUSTRIAL ENGINEERING

EIEI-401 Introduction to Operations Research I
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
A survey of elementary mathematical models within the field of systems and industrial engineering. Areas of study include game theory, network analysis, replacement theory, and inventory theory. (EIEI-401 or consent of instructor)
Class 4, Credit 4

EIEI-415, 516 Human Factors I, II
A survey of Human Factors from 1) Physiological constraints of the human; 2) Behavioral/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
Methods of measuring and analyzing work, human capabilities, micromotion, memotion 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

COURSE DESCRIPTIONS / INDUSTRIAL ENGINEERING 191

EIEI-422 Systems and Facilities Planning
An investigation of planning and layout of systems and facilities. Material handling activity relationships, space determination and location planning.
Class 4, Credit 4

EIEI-450 Design of Experiments
A survey of different research strategies for various situations. Survey methodology, field studies, classical experimental situations as well as industrial environments are reviewed. Emphasis is placed upon pragmatic assessments of assumptions inherent in the statistical models used in each area.
Class 4, Credit 4

EIEI-481 Management Theory and Practice
Development of the fundamental principles of the industrial enterprise. Internal organization as well as general economic conditions are considered. Comparison of theoretical techniques and actual practice is encouraged through case studies.
Class 4, Credit 4

EIEI-482 Production Control
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
A continuation of Operations Research II. Areas of study include waiting line models, markov chains and application, simulation and its application to mathematical models. (EIEI-402 or consent)
Class 4, Credit 4

EIEI-510 Applied Statistical Methods I
An introduction to the principles and methodology of statistical experimentation. Point and interval estimation, tests of hypothesis, correlation and regression. Emphasis placed on engineering applications. (SMAM-352)
Class 4, Credit 4

EIEI-511 Applied Statistical Methods II
A continuation of Applied Statistics I. Statistical experimentation, analysis of variance, quality control using attributes and variables, control charts and sampling inspection. (EIEI-510)
Class 4, Credit 4

EIEI-520 Engineering Economy
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-599 Independent Study
A supervised investigation within an industrial engineering area of student interest. (Consent)
Class Variable, Credit Variable

MECHANICAL ENGINEERING

EMEM-332 Mechanics II (Dynamics)
Rectilinear and curvilinear motion using vector calculus. Work, power, and energy. Impulse, momentum, and impact. Mechanical vibrations. Special problems. For students majoring in Electrical and Industrial Engineering. (SMAM-305 and EMEM-336)
Class 4, Credit 4

EMEM-335 Strength of Materials
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. For students majoring in Industrial Engineering. (EMEM-336)
Class 3, Lab. 2, Credit 4

EMEM-336 Statics
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, SPSG-205)
Class 3, Lab. 2, Credit 4

COURSE DESCRIPTIONS / MECHANICAL ENGINEERING 193

EMEM-440 Mechanical Systems Analysis
The course is a basic introduction to automatic controls. Topics covered include writing and solving differential equations for mechanical systems, analog computers, block diagrams and block diagram algebra, Laplace transforms, and open loop transfer functions.
Class 3, Lab. 2, Credit 4

EMEM-502 Mechanical Engineering Laboratory II
Two four-hour periods per week are provided during which the student applies the experimental techniques learned in EMEM-401 to the engineering systems studied in the theory courses. The student groups propose, design, execute, and analyze a sequence of experimental projects utilizing equipment in the power laboratory, the materials laboratory, and the systems laboratory. Formal presentation of the results will be required for some of the experiments performed. (EMEM-401)
Lab. 8, Credit 4

EMEM-514 Heat Transfer
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 3, Lab. 2, Credit 4

EMEM-532 Introduction to Machine Design
The analysis and theory of machine design and applications to systems design problems. Particular emphasis is placed on the design and analysis of machine elements.
Class 3, Lab. 2, Credit 4

EMEM-599 Independent Study
An assigned project encompassing both analytical and experimental work integrating the student's education in mechanical engineering.
Class Variable, Credit Variable

EMEM-661 Fluid Mechanics II
A continuation of Fluid Mechanics I with introduction to one dimensional compressible flow, 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-678 Mechanical Vibrations
Harmonic and nonharmonic vibration of systems with one degree of freedom, vibration of systems with several degrees of freedom, generalized coordinates and Lagrange's equations, vibration of elastic bodies. (EMEM-439)
Class 4, Credit 4

TECHNICAL ELECTIVES IN
MECHANICAL ENGINEERING

EMEM-632 Advanced Mechanical Systems 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.
Class 4, Credit 4

EMEM-635 Industrial Heat Transfer
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 classroom experience. (EMEM-514)
Class 4, Credit 4

194 COURSE DESCRIPTIONS / MECHANICAL ENGINEERING

EMEM-650 Gas Dynamics
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
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
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.
Class 4, Credit 4

EMEM-660 Refrigeration and Air Conditioning
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 air conditioning systems. Students are expected to do a design project. (EMEM-414)
Class 4, Credit 4

EMEM-664 Engineering Acoustics and Noise Control
A basic course in the principles of acoustics and the applications of sound measurements and noise control in industry and the community. Topics to be 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
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-668 Environmental Engineering Laboratory and Project
A continuation of experiments in the areas of air pollution, water, waste water and solid waste, concluding with an analysis/design problem of the student's choosing. Activities will include: monitoring, sampling and analysis of effluent and sediment; field trips and assessment of existing systems; laboratory and project reports.
Class 4, Credit 4

EMEM-669 Introduction to Water Pollution
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
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
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.
Class 3, Lab. 2, Credit 4

EMEM-675 Probabilistic Approach to Design
This course should be a first course in probability theory. The statistical nature of design variables, usually ignored, is considered. Reliability ("probability of survival after a certain period") is to be stressed as opposed to the conventional "factor of safety" concept.
Class 3, Lab. 2, Credit 4

COURSE DESCRIPTIONS / MECHANICAL ENGINEERING 195

EMEM-676 Kinematic Analysis of Mechanisms

A course in mechanisms: motion, velocity, acceleration analysis; the design of linkages, cams, special gearing, variable speed drives.

Class 3, Lab. 2, Credit 4

EMEM-677 Modern Energy Conversion

Principles of energy conversion, introduction to semiconductors, thermoelectric generators, photovoltaic generators, thermionic generators, magnetohydrodynamic power generators.

Lab. 4, Credit 4

EMEM-679 Mechanical Systems Analysis II

An advanced course in feedback systems covering such areas as compensation, complex control systems, A-C systems and nonlinear systems. Students are encouraged to undertake individual projects. (EMEM-440)

Class 4, Credit 4

EMEM-680 Advanced Thermodynamics

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-683 Statistical Thermodynamics

The fundamentals of thermodynamics are developed from a statistical model of discrete particles. Topics covered include kinetic theory, elementary transport parameters, Maxwell-Boltzmann statistics, Fermi-Dirac and Bose-Einstein statistics with applications to gases and vapors. (EMEM-414)

Class 4, Credit 4

EMEM-684 Advanced Dynamics

Newton's equations of motion for a system of masses, their solution, momentum, energy. Systems with variable mass, rocket equations. Variational principles of mechanics, stability of motion, gyroscopes. (EMEM-439, SMAM-309)

Class 4, Credit 4

EMEM-685 Advanced Strength of Materials

Curved beams, beams on elastic foundations, thick-walled cylinder, energy methods. (EMEM-439)

Class 4, Credit 4

EMEM-689 Patent Law and Protection

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

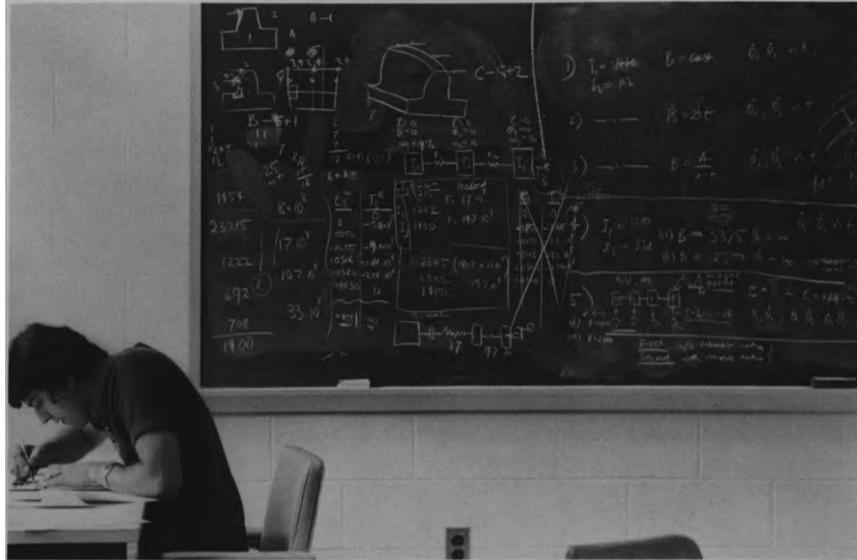
This course will study the role of the engineer in society and in particular his responsibility in the analysis and solution of the problems facing the environment in an increasingly technological society. Problems to be studied from a "case study" standpoint will include such things as air, water, and 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 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 I

Complex stress in two and three dimensions including Mohr's circle and polynomial solution for principal stresses. Theories of failure and experimental verification for ductile and brittle materials. Fracture mechanics fundamentals. Energy methods for structural analyses. Virtual work, Maxwell-Betti theorem, Castigliano's theorems. Applications including bending, shear, charge of section and complex loading. (EMEM-338)

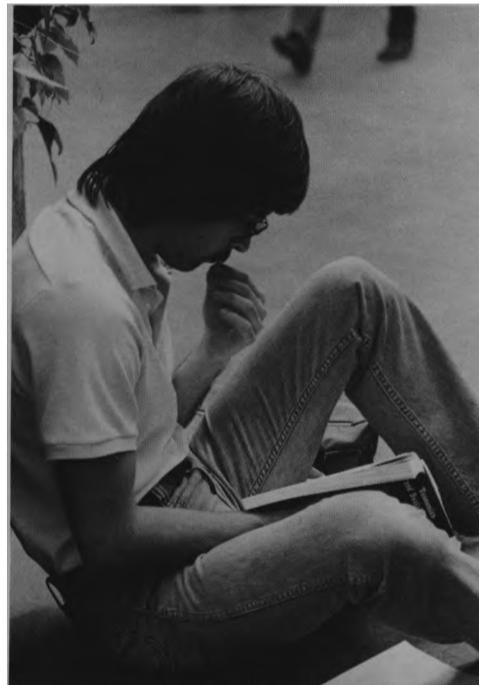
Class 4, Credit 4



EMEM-695 Solid Waste Management
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
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

EMEM-697 Stress Analysis II
A continuation of Stress Analysis, EMEM-694. The course will include topics such as stress concentrations, fatigue, contact stresses, wear, brittle fracture, viscoelastic behavior, dynamic stress analysis, impact, and a continuation of experimental stress analysis.
Class 4, Credit 4



College of Fine and Applied Arts

Course Descriptions

SCHOOL OF ART AND DESIGN

Credit shown is for each quarter.

FADC-301, 302, 303 Introduction to
Communication Design

Sequential course for three quarters providing the fundamental background to help the pre-major determine individual direction. Basic problems will explore both the theory and application; analysis and content; use of basic design instrumentation; verbal/visual interrelationships; and design methodology.

Lab. 6, Credit 5

FADC-401, 402, 403 Communication Design I

Creative problem-solving experiences relating to visual communication imagery such as graphic design, advertising design, illustration. Media Center facility available for extension of studio problems. (FADC-301, 302, 303)

Lab. 12, Credit 6

FADC-411, 412, 413 Communication Design

A professional elective, providing the opportunity to carry on further the objectives of FADC-401, 402, 403.

Lab. 6, Credit 3

FADC-501, 502, 503 Communication Design

A continuation of FADC-401, 402, 403. Advanced creative problem-solving experiences relating to visual communication imagery such as graphic design, advertising design, and illustration. Media Center available for extension of studio problems. (FADC-401, 402, 403)

Lab. 18, Credit 9

FADC-511, 512, 513 Communication Design

A professional elective, providing the opportunity to carry on further the objectives of FADC-501, 502, 503.

Lab. 6, Credit 3

FADC-520 Professional Design
Business Practices 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

FADE-301, 302, 303 Industrial/Environmental
Design

An introduction to the fundamentals of applied design for the simple mass-produced product. The course emphasis is on the origins of applied design concepts, the importance of the human element, the considerations of technology and the skills required to execute and complete solutions to an applied design.

Lab. 6, Credit 3

FADE-401, 402, 403 Industrial/Environmental
Design

An introduction to the fundamentals of applied design for the simple mass produced product. The course emphasis is on the origins of applied design concepts and the importance of the human element in those concepts, the development of those design concepts into mass produced goods, the considerations of the technology that is instrumental in the developing of those design concepts, and the execution of completed solutions to an applied design. (FADE-301, 302, 303)

Lab. 12, Credit 6

FADE-411, 412, 413 Design Applications

Projects in industrial design, display, interiors, and packaging, developed through visuals, materials, and process.

Lab. 6, Credit 3

198 COURSE DESCRIPTIONS / FINE ARTS

FADE-501, 502, 503 Industrial/Environmental Design

An intermediate study of the practice of applied design for the more complex mass produced product. The course emphasis is on the increasing complexity of the design challenges, stemming from the realistic concern for the interrelationships of the social, business, technological and human influences, and their constant dependence upon one another.

Field trips into the variety of area manufacturing corporations, and classroom exchange with the design people from those corporations, is an active part of the course.

During this year, an undergraduate thesis will be undertaken by the student as part of his course requirement. (FADE-401, 402, 403)

Lab. 18, Credit 9

FADE-511, 512, 513 Design Applications

A continuation of course FADE-411, 412, 413 with additional emphasis on professional procedures, function, structure, and processes as they apply to the field. (FADE-411, 412, 413)

Lab. 6, Credit 3

FADF-205, 206, 207 Creative Sources

This course is designed to make the student aware of his environment, his physical being and his 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

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 of action, structure, and gesture through quick sketches.

Lab. 9, Credit 4

FADF-221, 222, 223 Photo Design I

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

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

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)

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 2

FADF-321, 322, 323 Photo Design II

Emphasis upon problems which are related to visual phenomena, fundamentals, and communications.

Lab. 3, Credit 2

FADP-301, 302, 303 Advanced Drawing

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-320 Color

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

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

COURSE DESCRIPTIONS / FINE ARTS / CRAFTS 199

FADP-411, 412, 413

Painting

A professional elective, providing the opportunity to carry on further the objectives of FADP-401, 402, 403.

Lab. 6, Credit 3

FADP-420

Illustration

One quarter course exploring the art of the illustrator; his 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-501, 502, 503

Painting

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

Lab. 18, Credit 9

FADP-511, 512, 513

Painting

A professional elective, providing the opportunity to carry on further the objectives of FADP-501, 502, 503

Lab. 6, Credit 3

FADR-401, 402, 403

Printmaking

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

A professional elective, providing the opportunity to carry on further the objectives of FADR-401, 402, 403.

Lab. 6, Credit 3

FADR-501, 502, 503

Printmaking

Continuation of third-year practices. Opportunity is presented for a major concentration of a particular medium. (FADR-401, 402, 403)

Lab. 18, Credit 9

FADR-511, 512, 513

Printmaking

A professional elective, providing the opportunity to carry on further the objectives of FADP-501, 502, 503

Lab. 6, Credit 3

FADS-411, 412, 413

Sculpture

Three quarter course developing 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

Credit shown is for each quarter.

FSCC-200

Ceramics Materials and Processes

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

Craft Elective I

An elementary course in design and techniques in ceramics.

Lab. 6, Credit 3

FSCC-300

Ceramic Materials and Processes

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

200 COURSE DESCRIPTIONS / CRAFTS

FSCC-351, 352, 353 Craft Elective II
A sequential course of study based upon the experiences of the prerequisite, providing opportunity for more advanced projects. (FSCC-251, 252, 253)
Lab. 6, Credit 3

FSCC-400 Ceramics Materials and Processes
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
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 Art and Civilization
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
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
The development of the arts in the twentieth 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
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-300 Glass Materials and Processes
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 maintenance of equipment, research projects, papers, and reports.
Lab. 15, Credit 5

FSCG-400 Glass Materials and Processes
Sequential course for three quarters, introducing 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
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 work in a manner to reflect a continuity and growth of style.
Lab. 24, Credit 8

COURSE DESCRIPTIONS / CRAFTS 201

FSCM-200 Metalcrafts Materials and Processes

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 in copper, bronze, brass, and pewter. Enameling techniques. Discussion of design, materials, processes, and equipment.

Lab. 15, Credit 5

FSCM-251, 252, 253 Craft Elective I

An elementary course in design and techniques in metalcrafts.

Lab. 6, Credit 3

FSCM-300 Metalcrafts Materials 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 Craft Elective II

A sequential course of study based upon the experiences of the prerequisite, providing opportunity for more advanced projects. (FSCM-251, 252, 253)

Lab. 6, Credit 3

FSCM-400 Metalcrafts Materials 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

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

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 Craft Elective I

An elementary course in design and techniques in textiles.

Lab. 6, Credit 3

FSCT-300 Textile Materials and Processes

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 ten-harness looms. Experiments and research with novelty fibers. Independent study, papers, reports.

Lab. 15, Credit 5

FSCT-351, 352, 353 Craft Elective II

A sequential course of study based upon the experiences of the prerequisite, providing opportunity for more advanced projects. (FSCT-251, 252, 253)

Lab. 6, Credit 3

FSCT-400 Textile Materials and Processes

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

202 COURSE DESCRIPTIONS / CRAFTS

F SCT-500 Textile Techniques and Thesis
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

F SCW-200 Woodworking Materials 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

F SCW-241, 242, 243 Mechanical Drawing
A beginning course, covering the fundamentals of drafting, oriented to the needs of the interior and furniture designer.
Lab. 2, Credit 1

F SCW-251, 252, 253 Craft Elective I
An elementary course in design and techniques in woodworking.
Lab. 6, Credit 3

F SCW-300 Woodworking Materials 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

F SCW-351, 352, 353 Craft Elective II
A sequential course of study based upon the experiences of the prerequisite, providing opportunity for more advanced projects. (FSCW-251, 252, 253)
Lab. 6, Credit 3

F SCW-400 Woodworking Materials 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

F SCW-500 Woodworking Techniques 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



College of General Studies

Course Descriptions (Degree Programs)

BASIC CURRICULUM IN CRIMINAL JUSTICE

GCJC-201 Fundamentals of the Criminal Justice System

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 special problems within the branches of the criminal justice system such as: using of force, improper evidence collection and admission, discretionary decision making, riots, strikes, natural disasters, narcotic traffic, sexual deviance, and vice control.

Class 3, Credit 4

GCJC-202 Etiology of Crime: Sociological, Psychological and Psychiatric

Analysis of the sociological, psychological, and psychiatric views of the etiology of crime and other forms of deviant behavior; studies in conformity, moral development, family psychopathology and the assumption and maintenance of deviant roles; comparative studies of deviance in different cultural, ethnic and sexual groups; mental disorders in relation to crime and delinquency.

Class 3, Credit 4

GCJC-203 Introduction to Criminology

A survey of the major forms of contemporary crime with emphasis on definition of crimes and criminality, the extent of crime, criminal typologies, and fundamental aspects of the social control of crime.

Class 3, Credit 4

GCJC-204 Public 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.

Class 3, Credit 4

GCJC-301 Fundamental Concepts and Patterns of Criminal Law

The course will investigate assumptions and conceptions of law, crime, and social issues. It will concentrate on the history of various criminal justice systems as compared to contemporary criminal justice systems, the dynamics of criminal law reform, and its relationship to constitutional law.

Class 3, Credit 4

GCJC-302 History of Organized Crime 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.

Class 3, Credit 4

GCJC-303 Law Enforcement and Society: 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.

Class 3, Credit 4

GCJC-304 The Judicial Process

An examination of judicial systems (criminal and juvenile) from indictment through sentencing, their functions and operation, their internal and external relationships, and their impact upon the community. Emphasis will be placed on field visits, group projects, and research.

Class 3, Credit 4

COURSE DESCRIPTIONS / GENERAL STUDIES / SOCIAL WORK 205

GSWS-302 Social Welfare I: History
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.
Class 3, Credit 4

GSWS-303 Social Welfare II:
Profession and Issues
Examines the profession of social work. It will look at the values in social work practice, as stated in the Code of Ethics, and examine the issues of licenses, advocacy and the Hatch Act, and professional organizations.
Class 3, Credit 4

GSWS-304 Social Welfare III:
Organization 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 need and services; 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.
Class 3, Credit 4

GSWS-305 Social Work Field Study
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 is meant to follow *Introduction to Social Work*, and to illustrate social work in practice, not in theory.
Class 3, Credit 2

GSWS-411,412, 413 Methods of
Social Work I, II, III
Methods of Social Work is a three-quarter sequential course offered concurrently with field experience. Concurrent field experience requires a part-time placement in a community agency as part of the course requirement of Methods I (GSWS-411). Methods II and III (GSWS-412, 413) are offered concurrently with Field Instruction I and II (GSWS-421, 422).
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.
Class 3, Credit 4/Qtr.

GSWS-421, 422 Field Instruction I, II
Under the guidance of an instructor, the student is placed in a cooperating social, governmental, or educational agency in order that he may gain first-hand experience with their organization, programs, and methods of work. Closely supervised work at the agency is supplemented by periodic consultations with the instructor.
Credits 5/Qtr.

GSWS-531 Research Methods
Introduction to the methodology of research in behavioral and social sciences. Stress will be laid on the use of theoretical leads, 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.
Class 3, Credit 4

GSWS-534, 535, 536 Seminar I, II, III
 For social work seniors who have completed field experience. A study of a variety of professional areas to be defined by students, with staff participation. Each student's input will be based upon the field experience and its related work, and academic experience to strengthen areas of professional and personal concern. Includes a research project and may include "supervision" of a freshman in the first field experience.
 Class 3, Credit 4/Qtr.

(General Service Courses)

LANGUAGE AND LITERATURE AREA

GLLC-202 American Issues
 A study of political language as a way of emphasizing the need for clarity in reference to major issues in American life.
 Class 3, Credit 4

GLLC-204 Utopian Literature: Modern Culture in Conflict
 Deals with the problems of polarization of humanism and scientism.
 Class 3, Credit 4

GLLC-205 Creative Writing I
 The study and practice of the many ways to examine experience in language.
 Class 3, Credit 4

GLLC-206 Imagination: Understanding and Creativity
 Focus will be on the processes and problems involved in man's critical and creative thinking.
 Class 3, Credit 4

GLLC-210 Critical Analysis of Contemporary Affairs
 Designed to cultivate intelligent analysis of contemporary issues and encourage constructive criticism of opinions on current concerns.
 Class 3, Credit 4

GLLC-211 Separate Realities
 Approaches to writing will be studied through an investigation of the theme of non-ordinary perceptions of reality in literature ranging from Lewis Carroll's *Alice in Wonderland* to Carlos Castaneda's *Journey to Ixtlan*.
 Class 3, Credit 4

GLLC-212 Critical Thinking
 Designed to exercise the student in the tactics of sound reasoning, with emphasis on the issues of relativism, certainty, evidence, and the problems of knowledge generally.
 Class 3, Credit 4

GLLC-310 Literature as an Approach to Writing
 Emphasis will be on separate literary approaches that create problems in composition.
 Class 3, Credit 4

GLLC-311 Effective Composition
 An analysis of the techniques of effective expository writing with emphasis on regular practice in structuring and organizing essays, developing coherent paragraphs, writing cogent sentences, and sharpening vocabulary.
 Class 3, Credit 4

GLLC-401 Oral Communications
 The development of oral communications as an aid in more effective communications and human relations. Weekly practice talks with emphasis on organization of ideas, clarity, vocal expression, poise, interest, and appropriateness.
 Class 4, Credit 4

GLLC-402 Conference Techniques (Interpersonal Communication Skills II)
 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

COURSE DESCRIPTIONS / LANGUAGE AND LITERATURE 207

GLLC-403 Interpersonal Communication Skills I
 I.C.S. is designed to provide the student with a knowledge of the theory of basic human communication (language, paralanguage, and kinesics). A heavy emphasis is placed upon detecting cultural basis for communication difficulties. Projects are assigned to combine practice with theory in person-to-person communication situations.
 Class 3, Credit 4

GLLC-404 Interpersonal Communication Skills III
 An examination of the communication difficulties with the handicapped: specifically the deaf, blind and those with other physical handicaps. To include interpersonal, family, social and rehabilitation modes of communication.
 Class 3, Credit 4

or
 GLLC-431, 432, 433 Spanish I, II, III
 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 get in contact. Proficiency in Spanish would satisfy this requirement.
 Class 3, Credit 4/Qtr.

GLLC-421, 422 German
 The courses are designed to enable the student to read and understand technical and scientific German.
 Class 3, Credit 5

GLLC-501 Effective Speaking
 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
The history and theory of communication from basic human communication through the mass media extensional systems.
 Class 3, Credit 5

GLLL-320 Literature and Myth
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-321 Oral Interpretation
The examination of our literary heritage to encourage the appreciation of the artistry of literature composed to be read aloud.
 Class 3, Credit 4

GLLL-322 Literature and the Visions of Man
A study of major modern and contemporary writers with special emphasis on the visions of man's human condition.
 Class 3, Credit 4

GLLL-323 The Cycle of Life in Literature
A study of the literary uses of myths connected with the cycle of life.
 Class 3, Credit 4

GLLL-324 Guilt and Expiation
Masterpieces of world literature, ancient to modern, are selected to introduce literary forms (drama, prose, fiction, poetry) in various literary modes (Classical, Romantic, Realistic).
 Class 3, Credit 4

GLLL-325 Thematic Approach to Western Literature
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
An analysis of short stories, poems, plays, and the novel from various critical perspectives.
 Class 3, Credit 4

GLLL-328 Modern Criticism of Literature
Critical approaches to literature to provide the student with a standard of judgment in literature.
 Class 3, Credit 4

208 COURSE DESCRIPTIONS / LANGUAGE AND LITERATURE

GLLL-330 Voyage Literature
The treatment of the voyage in literature from Homer to the present.
Class 3, Credit 4

GLLL-331 Genres of World Literature
Survey of the primary genres of world literature: drama, novel, short story and poetry.
Class 3, Credit 4

GLLL-332 Survey of Western Literature
A chronological survey of the major literary genres of the Classical, Medieval, Renaissance, Neo-Classical, Naturalism-Realism, and Modern periods, employing the analytical study of the individual works.
Class 3, Credit 4

GLLL-501 Speculative Fiction
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-502 Selected Writers of the Twentieth Century
A study of American writers of the twentieth century with particular attention to the beginnings of realism, naturalism and symbolism.
Class 3, Credit 5

GLLL-503 Great World Drama
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
A generous sample of Shakespeare's comedy and history plays is investigated to reveal their literary excellence and their theatrical power.
Class 3, Credit 5

GLLL-505 The American Spirit in Literature
A survey of the development of American philosophy (political and social) through the study of selected works from the colonial period through 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
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-509 Black Literature
Black Literature is a historical survey of significant black writers from Revolutionary times until the present day.
Class 3, Credit 5

GLLL-513 Ecological Awareness in Literature
A chronological examination of man's attitude toward his environment. Emphasis on his worship, use, and abuse of nature.
Class 3, Credit 5

GLLL-515 Contemporary American Novel
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 Protest
Selected works by writers such as Sophocles, Dante, Dickens, Camus and Vonnegut as important works of art that reflect man's condition and implicitly prophesy against particular evils in attitudes or institutions of their times.
Class 3, Credit 5

COURSE DESCRIPTIONS / LANGUAGE AND LITERATURE 209

- GLLL-517 Literature of the Bible
A study of several books from the Old and New Testaments selected to show the range and variety of literary forms in the Bible.
Class 3, Credit 5
- GLLL-518 Creative Writing II
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
- GLLL-522 Mark Twain and the American Dream
Focus will be on the bittercomic writings of the last part of Twain's career.
Class 3, Credit 5
- GLLL-524 Contemporary Film
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-S27 Shakespeare: Tragedy and Romance
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
An examination of a major novel by Dickens, Dostoyevsky, Joyce and Faulkner to explore the particular genius of each writer and his contributions to the modern novel.
Class 3, Credit 5
- GLLL-529 Literature and Man's Religious Experience
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, Buddhism, Taoism
A study of the major religions of the East.
Class 3, Credit 5
- GLLL-532 The American and His Environment
An interdisciplinary ecology course, chronologically examining American attitudes and solutions to environmental problems.
Class 3, Credit 5
- GLLL-S33 The Modern Movement in Literature
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-534 Modern American Fiction
A study of the American Novel from 1900 to 1957.
Class 3, Credit 5
- GLLL-535 Technology and American Literature
A study of nineteenth and twentieth century short fiction and novels criticizing the impact of technology upon society.
Class 3, Credit 5
- GLLL-536 Short Fiction
The short story as a particular form of literature: definition, characteristics and aims.
Class 3, Credit 5
- GLLL-537 Modern American Poetry
The course will present a collection of a number of modern American poems with critical commentary to provide analytic techniques of this particular literary form.
Class 3, Credit 5
- GLLL-538 The Nightmare of Technology: Studies in 19th Century British Writing
Study of British prose and poetry on the effects of industrialism and the social problems in 19th century England.
Class 3, Credit 5

210 COURSE DESCRIPTIONS / GENERAL STUDIES / SCIENCE AND HUMANITIES

GLLL-539 Art Nouveau and Aestheticism
 A multi-disciplinary study of the relationship between the Art Nouveau and Aesthetic movements in late nineteenth century Europe. Attention will be devoted to parallel movements in literature, painting, and the crafts.
 Class 3, Credit 5

GLLL-540 Hero Image in the Theatre
 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
 The analyses of both the literary and cinematic qualities and characteristics of common works, with the emphasis on their similarities and differences and their resultant strengths and weaknesses as creative endeavors.
 Class 3, Credit 5

GLLL-542 Literature of Violence
 An evaluation of the promoting forces, the types, and the effects of violence as it occurs in literary themes from different periods and backgrounds.
 Class 3, Credit 5

GLLL-543 American Poetry
 Concentration on reading carefully a few American poets such as Walt Whitman and Emily Dickinson in the 19th century, and Eliot, Cummings, and Stevens in the 20th, and special emphasis given to some of the innovators since World War II.
 Class 3, Credit 5

GLLL-544 The City
 An interdisciplinary approach to the experience of the city both as recorded in art, history, literature, sociology, and as exemplified in part by the city of Rochester.
 Class 3, Credit 5

GLLL-546 Philosophy of Justice
 Examination of dissent and private conscience in collision with the claims of order and stability in a democratic society.
 Class 3, Credit 5

GLLL-560 Art of the Cinema
 A critical examination of certain films as an integral part of modern culture.
 Class 3, Credit 5

SCIENCE AND HUMANITIES AREA

GSHF-210 Introduction to the Performing 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 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-213 Introduction to the Visual Arts
 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
 A survey of American Architecture from the seventeenth 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-510 Primitive Art
 A study of "Primitive Art" and the creative process in tribal societies.
 Class 3, Credit 5

COURSE DESCRIPTIONS / SCIENCE AND HUMANITIES 211

GSHF-511 **Modern European Architecture**
 A critical analysis of European building from the engineering architecture of the late 19th century through the architecture of today.
 Class 3, Credit 5

GSHF-51X **Master Drawings Since the Renaissance**
 A study of drawings from the fifteenth to the twentieth century, including work by Leonardo da Vinci, Michelangelo, Durer, Rembrandt and Picasso.
 Class 3, Credit 5

GSHF-513 **Oriental Art**
 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**
 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**
 A study of the life, art and times of the Baroque master. Emphasis will be placed on his stylistic evolution, his relations to his society and to the Baroque style, and on his humanistic world view.
 Class 3, Credit 5

GSHF-520 **Picasso**
 The life and work of one of the most influential artists of our century.
 Class 3, Credit 5

GSHF-521 **The Arts Under Communism, Fascism and Nazism**
 The course will analyze the control the totalitarian regimes of Russia, Italy and Germany exercised over every form of artistic activity.
 Class 3, Credit 5

GSHH-301 **Modern American History**
 Political, social, cultural, and economic development of the American people in the modern period.
 Class 3, Credit 4

GSHH-302 **Modern European History**
 The major social, political, and intellectual movements of modern Europe.
Class 3, Credit 4

GSHH-303 **Latin American History: From Independence to the Modern Period**
 Survey of historical development of Latin America from independence through the 1960's.
Class 3, Credit 4

GSHH-304 **History of England**
 A political and constitutional history of England from the Anglo-Saxon period to the present.
Class 3, Credit 4

GSHH-308 **Man and Society**
 The study of man and society as an insight into current social and individual problems.
Class 3, Credit 4

GSHH-310 **The Future as History**
 Through historical analysis, the course will show that the past has caused the problems of today, and that historical courses must be understood if these problems are to be solved.
Class 3, Credit 4

GSHH-316 **The History of the World Since 1945**
 Survey of the major events of world history since 1945: Europe, Africa, Asia, and the United States.
 Class 3, Credit 4

GSHH-319 **Religious and Cultural Movements and the Shaping of Modern Society**
 The influence of religion on our society will be the focus of the course.
Class 3, Credit 4

212 COURSE DESCRIPTIONS / SCIENCE AND HUMANITIES

GSHH-320 The Unification of Europe:
Achievements and Perspectives

The European crises of this century, the American involvement in them, and the first attempts for reunification.

Class 3, Credit 4

GSHH-503 Communism, Fascism & Democracy
in 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 5

GSHH-505 The Immigrant in American History

This course traces the history of ethnic and racial minorities in the United States.

Class 3, Credit 5

GSHH-510 Modern Middle East

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

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-518 The Advance of Communism

An examination of the rapid expansion of Communism from the Russian Revolution of 1917 to present time including the rise of Communism in China, Yugoslavia and Eastern Europe, and Cuba. Emphasis will be placed on the causes which favored such an expansion as well as a review of the various avenues by which countries have become communistic.

Class 3, Credit 5

GSHH-519 United States-Latin American
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 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
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-528 History of Popular Culture
in America

A study of selected special social and cultural issues and topics in American History from the colonial period to the present, focusing as well on leading personalities.

Class 3, Credit 5

GSHH-530 19th Century American
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

GSHN-501 Astronomy
 A non-mathematical study of the motions and origins of the solar system as they relate to space investigation. Characteristics of the stellar system with particular emphasis on the evolution of man's knowledge of galaxies. Direct telescopic celestial observation is *not* a part of this course.
 Class 3, Credit 5

GSHN-502 Social Consequences of Technology
 An attempt to identify, understand, and probe the causes of current technological problems.
 Class 3, Credit 5

GSHN-503 Technology and the Individual
 A study of the effects on the life of the individual due to the acceleration of technological change.
 Class 3, Credit 5

GSHP-210 Introduction to Philosophy
 An introduction to some of the major problems in philosophy with readings from both classical and contemporary sources.
 Class 3, Credit 4

GSHP-211 Introduction to Moral Philosophy
 An introduction to moral philosophy through an analysis, comparison and evaluation of the main theories that have been offered as systematic ways of making moral decisions. Readings in both classical and contemporary sources.
 Class 3, Credit 4

GSHP-212 Introduction to Biblical Studies
 An introduction to the basis of Jewish and Christian beliefs through the Old and New Testaments and related texts.
 Class 3, Credit 4

GSHP-302 Greek and Roman Philosophy
 A study of classical philosophy from the time of Socrates to the Christian era.
 Class 3, Credit 4

GSHP-502 Philosophy of Religion
 A critical examination of such religious concerns as the nature of religion, the existence of God, the problem of evil, and life after death.
 Class 3, Credit 5

GSHP-504 Logic
 An introduction to the basic principles of Logic. The main emphasis will be on deductive logic (traditional and modern), but some attention will be paid to inductive logic as well.
 Class 3, Credit 5

GSHP-509 Problems About Moral Discourse
 Careful analysis and evaluation of various contemporary views concerning the meaning and function of moral language and the question whether or not moral judgments can be rationally justified. The course is designed for students who have had some previous exposure to philosophical analysis.
 Class 3, Credit 5

GSHP-510 Comparative Religions
 A study of major Western, Asiatic and African religions.
 Class 3, Credit 5

GSHP-511 Introduction to Social Philosophy
 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

SOCIAL SCIENCE AREA

GSSA-201 Introduction to Anthropology
 The course focuses on cultural rather than physical anthropology, is holistic in its approach, and will touch on all aspects of anthropology as the science of man. The course is a survey designed for non-anthropology majors.
 Class 3, Credit 4

GSSA-210 Introduction to Social Science:
 Anthropology
 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

COURSE DESCRIPTIONS / GENERAL STUDIES / SOCIAL SCIENCE 215

GSSE-210 Introduction to Economics
 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-301, 302 Principles of Economics
 A study of the basic concepts and principles pertaining to the economic behavior of the consumer and the firm (microeconomics), the economic problems of the nation (macroeconomics), and international economic relations.
 Class 3, Credit 4/Qtr.

GSSE-303, 304 Economics for Social Workers
 A study of basic concepts and principles of economics, related to the problems facing American society, as well as the policies adopted to solve these problems. Emphasis will be placed on the social consequences of various possible courses of action.
 Class 3, Credit 4/Qtr.

GSSE-503 Personal Finance
 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 investments.
 Class 3, Credit 5

GSSE-511 Economics and Politics of Consumer Protection
 An analysis of the economics and politics of consumer protection.
 Class 3, Credit 5

GSSM-211 American Politics
 To promote an understanding of the American political system and some of the major contemporary problems related to it.
 Class 3, Credit 4

GSSM-212 American Political Development
 An examination of the development of the American political system from the Constitutional Convention to the emergence of the Civil War.
 Class 3, Credit 4

GSSM-213 Introduction to Political 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-214 Theories of Political Systems
 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 4

GSSM-501 American Foreign Policy
 A study of certain aspects of the basic concepts and principles which influence American foreign policy.
 Class 3, Credit 5

GSSM-503 The Cold War
 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
 The major political, social, and economic developments affecting the U.S. in the 20th century.
 Class 3, Credit 5

GSSM-507 International Relations
 The basic concepts and theories of international relations, American foreign policy, and major developments in the contemporary world arena.
 Class 3, Credit 5

216 COURSE DESCRIPTIONS / SOCIAL SCIENCE

GSSM-508 Government and Politics
of the Soviet Union
Designed to examine the Soviet political system with emphasis on ideology, Party apparatus, and governmental institutions.
Class 3, Credit 5

GSSM-510 Comparative Politics
Designed to provide a mode of analysis for the study of political systems in the U.S., Great Britain, France, Federal Republic of Germany, and the U.S.S.R.
Class 3, Credit 5

GSSM-512 Urban Politics
For students interested in a general understanding of the capacity of urban government in solving urban problems.
Class 3, Credit 5

GSSM-530 Modern Germany
A study of Germany in the 19th and 20th centuries.
Class 3, Credit 5

GSSP-203 The Psychology of Childhood
and Adolescence
A systematic, integrated, and interpretive study of a growing person. Includes physical, cognitive, social, moral and emotional development.
Class 3, Credit 4

GSSP-204 Dynamics of Abnormal Psychology
Description and theories of the nature and development of behavioral disorders. Contemporary treatment procedures will also be discussed with emphasis on its implications to social work.
Class 3, Credit 4

GSSP-206 Fundamentals of Psychology
A selection of topics drawn chiefly from social and clinical psychology, learning, motivation, and personality with special emphasis on theories of personality.
Class 3, Credit 4

GSSP-210 Introduction to Psychology
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
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
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
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
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-510 Social Psychology
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 4

GSSP-511 Humanistic Psychology: An Introduction
Emphasis on the value and worth of the individual with concern for the person's perception of the here-and-now in coping with life.
 Class 3, Credit 5

GSSP-512 Psychology of Personality
 A consideration of theories of personality classification and development.
 Class 3, Credit 5

GSSP-513 Psychology of Motivation
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

GSSS-201 Fundamentals of Sociology
 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-202 Introduction to Social Science
An introductory examination of causes, patterns, and consequences of human behavior, individually and in groups, drawing upon the findings of contemporary social science.
 Class 3, Credit 4

GSSS-302 Family Systems
 A family system, from a cultural and social class perspective, with emphasis on changing patterns of courtship and mate selection, family role organization and interaction patterns throughout the family cycle; sources of conflict, stress and disorganization; prospects for the future. Similar to GSSS-514, but with emphasis on its implications to social work.
 Class 3, Credit 4

GSSS-303 Social Discrimination
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 4

GSSS-304 Deviance in Society
This course examines the conditions under which deviance as a social reality emerges, develops and changes temporally in the United States and how the process of social liability emerges and its consequences. Secondly, the course deals with specific (or individual) deviant careers, the formation of deviant subcultures and the transformation of a deviant identity. Finally, this course deals with methods of evaluation and solution of the deviant problem, as it relates to the field of social work.
 Class 3, Credit 4

GSSS-502 Contemporary Social Problems
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-503 Dynamics of Social Groups
The nature and function of small groups, the participation of the individual in the group, and the role of groups in our society will be studied.
 Class 3, Credit 5

GSSS-504 Intergroup Relations: American Racial and Ethnic Minorities
A sociological analysis of relations between ethnic, racial, and religious groups.
 Class 3, Credit 5

GSSS-505 Juvenile Delinquency
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-507 Marriage and the Family
Contemporary trends in courtship patterns, male-female relationships and marital systems (a general education elective appropriate for any upper class student).
 Class 3, Credit 5

GSSS-511 Population & Society
Study of demographic variables of mortality, fertility, and migration as they affect the rise and quality of population.
 Class 3, Credit 5

*College of Graphic Arts
and Photography*

Course Descriptions

**SCHOOL OF PHOTOGRAPHIC ARTS
AND SCIENCES**

BIOMEDICAL PHOTOGRAPHY

PPHB-201, 202, 203 Biomedical Photography I

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

PPHB-211 Survey of Biomedical
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

Further study and practice of theory and principles used in Biomedical Photography, including photomacrography, photomicrography, operating room techniques, infrared and ultraviolet light, biological field studies.

Class 2, Lab 10, Credit 5

PPHB-331, 332, 333 Preparation of Biomedical
Visuals

Study of basic principles of effective visual communication and design. Student will produce slide and motion picture presentations and exhibition displays.

Lab.: F-4, W-4, S-6, Credit 3

PPHB-501, 502, 503 Senior Thesis Production

An investigation, planning, organization and production of an audio-visual presentation, a learning package and informational program for a biomedical communications client.

The biomedical communications package will be reviewed for appropriateness of design and content.

Class 2, Lab 8, Credit 4

FILMMAKING

PPHF-207, 208, 209 Introduction to Film
Making and Television

Film as a means of communication. Involves students in the basic aesthetic principles, production, processes and techniques governing modern film making as it relates to dynamics to all basic phases of motion picture production in the Super 8mm format and are engaged in a variety of production projects, individual and crew, each quarter. Special regard is given to Art and Design students in relation to film making; comparison and contrast of film with other forms of artistic expression; seeing and representing movement through cinematography and editing; the non-representational abstractionist movement in film making; animation, titles and story-boards as art work; set and costume design. Students furnish film and processing; equipment is furnished. The spring quarter (PPHF-209) is devoted to the television medium. (The previous two quarters, PPHF-207, 208 are NOT prerequisites for the TV quarter.) Students will learn how to communicate with the medium, producing programs of their own design within a fairly wide latitude. Course includes work as a crew member on the production of programs designed by the other students in the class. The commonalities and differences as regards film and television will be emphasized.

Class, Lab, Studio, 7 hours, Credit 3

220 COURSE DESCRIPTIONS / PHOTOGRAPHY / FILM MAKING

PPHF-401, 402, 403

Film Making I

Film as an artistic medium of expression. A combined theoretical-practical approach to dynamics of film imagery, movement and all basic phases of motion picture production in the Super 8mm format; script writing, production planning, motion picture camera, emulsions, lighting, non-synchronous sound, editing. Activities include lecture-discussions, studio work and demonstrations, student productions, screenings, critiques, student presentations, screenings and editing laboratory. The television camera is used as a visual aid in various demonstrations. Students furnish film and processing; equipment is furnished by the department.

Class 2, Lab 8, Credit 4

PPHF-407, 408, 409

History and Aesthetics
of Film

An analytical study of film methods from the early beginnings of motion pictures to the sound era and present production techniques. The screening of "classic" films from U.S., France, Germany, Russia, Italy and Britain including features, documentaries, avant-garde and experimental subjects. An average of 16 features are reviewed each quarter, plus special documentaries and short subjects. Special written material is provided on each film screened.

The object of the course is to bring to the student a comprehensive background of the film movement and to make him conscious of the methods of outstanding director's techniques and how the art of the film progressed from early available production equipment to the state of the art today. Written reports, as assigned, are required of the student.

Class 3, Credit 3

PPHF-501, 502, 503

Film Making II

Theory and practice in the communication of ideas on film and the relationship of modern production techniques. The main thrust of the course is a composite art, shaped in the direction process. Course includes properties of sound, recording, voice, music and effects, sound transfers and mixing, editing with sound, conforming A and B rolls.

The use of the single system sound camera is included. Students will be expected to furnish their own supplies, processing and exposure meter. Motion picture cameras, lighting and editing equipment will be furnished. (PPHF-403 or permission of the instructor.)

Class 2, Lab 8, Credit 4

PPHF-507, 508, 509

Television Production

Use of the television medium to communicate with audiences. Course emphasizes the producing and directing of informational programs of the student's design and includes work as a crew member on other students' productions: lighting, camera operation, video switching, audio control. A secondary emphasis is put on television as a social, legal and technical phenomenon. All materials are furnished except expendable graphic supplies.

Class 2, Lab 8, Credit 4

GENERAL PHOTOGRAPHY

PPHG-200

Photography

A ten-week summer course for students entering the transfer program in Photographic Illustration and Professional Photography. This is equivalent to Photography PPHG-201, 202, 203.

Credit 12

PPHG-201, 202, 203

Photography

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 upper-class 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

PPHG-207, 208, 209

Still Photography

In the first quarter the students become familiar with the 35 mm 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

COURSE DESCRIPTIONS /PHOTOGRAPHIC ILLUSTRATION 221

PPHG-210 Materials and Processes of Photography

A ten-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 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 reviews of 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

PHOTOGRAPHIC ILLUSTRATION

PPHL-301, 302, 303 History and Aesthetics 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 designed to illuminate phases of photographic history best understood by personal visual exploration.

Class 3, Credit 3

PPHL-311, 312, 313 B.F.A. Photography II

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 B.F.A. degree candidates.

Class 3, Lab. 9, Credit 6

PPHL-401, 402, 403 Photography as a Fine Art I

The third-year course for students majoring in photography as a fine art places emphasis on expanding the individual's ability and understanding of photography as a light-sensitive medium for communicating ideas. This is done through exploration of traditional as well as non-silver print-making techniques. The course is intended to develop an awareness and sensitivity to shared concepts among other disciplines in arts. (PPHL-303)

Class 2, Lab. 8, Credit 4

PPHL-411, 412, 413 Photojournalism I

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 picture 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

PPHL-421, 422, 423 Nature Photography

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 man's attitudes toward and impact on his environment. (PPHG-203)

Class 2, Lab. 8, Credit 4

222 COURSE DESCRIPTIONS / PHOTOGRAPHIC PROCESSING

PPHL-431, 432, 433 Illustration Photography I

Advanced and extended study of the *making* of photographs in 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

PPHL-437, 438, 439 Visual Communications
Workshop

Primarily a photographic course, however, emphasis is placed on experimental approaches to communications. Visual and psychological 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

PPHL-501, 502, 503 Photography as a Fine Art II

The major emphasis is placed on the individuals 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-impositions of unnecessary limitations. Development of awareness to the other arts is continued. (PPHL-403)

Class 2, Lab. 8, Credit 4

PPHL-511, 512, 513 Photojournalism II

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

PPHL-521, 522, 523 Color Photography
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

PPHL-531, 532, 533 Illustration Photography II

Advanced individual creative approaches to visual problem solving. Conceptual ideas employing the photographic medium is stressed. The student is encouraged to find a personal photographic approach and to develop a portfolio. (PPHL-433)

Class 2, Lab. 8, Credit 4

PHOTOGRAPHIC PROCESSING
AND FINISHING MANAGEMENT

PPHM-201, 202, 203 Basic Principles
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

PPHM-300 Machine Processing

A ten-week summer course which provides an opportunity for students who have completed basic photography to gain an understanding of all aspects of machine processing. 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.

12 Qtr. Cr.

226 COURSE DESCRIPTIONS /PHOTOGRAPHIC SCIENCE

PPHS-501, 502, 503 Research
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, PPHS-413)

Class 2, Credit 2 (Fall)
Class 2, Lab. 9, Credit 4 (Winter and Spring)

PPHS-511,512, 513 Optical Instrumentation
Principles of geometrical and physical optics, image evaluation, optical instruments, and instrumentation. (SMAM-305, SPSP-303)

Class 3, Credit 3

PPHS-521, 522,523 Imaging Systems and Evaluation
Analytical foundations of image formation and evaluation, the response characteristics of image-forming devices: lenses, photographic emulsions, and other sensors, methods for engineering photo-optical systems, image evaluation instrumentation. (PPHS-403, SMAM-305, SPSP-303)

Class 2, Lab. 6 Credit 4 (Fall)
Class 2, Credit 2 (Winter and Spring)

PPHS-531, 532,533 Theory of the Photographic 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-303, SCHG-207, SMAM-305, SPSP-303)

Class 3, Credit 3

GRADUATE COURSES
(Fifth Year of five-year program)

PPHS-700 Principles of Photographic Science
A course intended for students who have completed their undergraduate programs in engineering, or the sciences and who now wish to prepare themselves for entry into the graduate program in Photographic Science and Instrumentation. It is an intensive course, assuming working knowledge of mathematics, physics, and chemistry, and includes radiation theory and radiometry, properties of radiation-sensitive materials, chemistry and kinetics of photographic processing, sensitometry, tone reproduction, principles of color measurement, and color photographic systems.

Credit 15 (Summer only)
(Not applicable to 45 required graduate credits)

PPHS-701, 702, 703 Principles of Photographic Science
Equivalent to PPHS-700, but offered in the evening and Saturdays during the regular Fall, Winter and Spring quarters.

Credit 15
(Not applicable to 45 required graduate credits)

PPHS-711, 712,713 Theory of the Photographic Process
Physical structure and optical properties of the silver halide emulsion and their relations to the characteristic curve; chemistry and preparation of emulsions; extensive treatment of theory of sensitivity and latent image formation; chemistry and kinetics of processing, including color processing; theory of color reproduction; chemistry and physics of selected non-silver processes.

Class 3, Credit 3

PPHS-721, 722 Mathematics for Photographic Systems
A special graduate course in mathematics involving those areas of direct concern in design, analysis, and evaluation of photographic systems.

Class 4, Credit 4

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
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
and Engineers

An introduction to the theory and application 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

PPHS-210 Fundamentals of Photographic
Science II

An intensive course presenting the subject matter normally taken by Photographic Science and Instrumentation students during their second year. Topics include basic photographic and instrumentation optics, the chemistry of non-conventional black and white and color processing, and a continuation of the topics covered in PPHS-200.

Credit 9

PPHS-301, 302, 303 Principles of Photographic
Systems I

A continuation of PPHS-203. The chemistry of unconventional black and white and color processing, basic photographic and instrumentation optics, and sensitometry and densitometry of photo-sensitive materials. (PPHS-203)

Class 2, Lab. 6, Credit 4

PPHS-401, 402, 403 Principles of Photographic
Systems II

The analysis of radiation and radiation sources, modulators, and detectors; theory of color measurement and color reproduction systems; fundamentals of image evaluation and photographic image structure. (PPHS-303, SMAM-305, SPSP-303)

Class 3, Lab. 6, Credit 5

PPHS-411 Statistical Inference

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

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

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
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 and engineering. Nomenclature, structure, and property trends, equilibrium, kinetics, electrochemistry, catalysis, photochemistry, instrumentation and analytical techniques. (PPHS-203, SMAM-207)

Class 3, Lab. 3, Credit 4

224 COURSE DESCRIPTIONS / PROFESSIONAL PHOTOGRAPHY

PPHP-4X1, 412, 413 Sensitometry
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, PPHG-203)
Class 3, Lab. 3, Credit 4

PPHP-421, 422, 423 Advertising Photography
A course built strictly to the standards of professional photography. Only those students who seriously aspire to be professional craftsmen 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 own natural ability and interests. Approximately half of the photography will be in color. (PPHP-303 and/or PPHL-313) Equipment required: a SLR or TLR 2 1/4" camera.
Class 2, Lab. 7, Credit 4

PPHP-431 Forensic Photography
The use of photography in forensic application for business and industry, surveillance, photographic evidence, forgery detection, safety. (PPHG-203)
Class 2, Lab. 6, Credit 4

PPHP-441, 442, 443 Advanced Color Printing
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-311 or some previous experience is required.
Lab. 8, Credit 4

PPHP-501, 502, 503 Industrial Photography Seminar
Depending on the student's interest, the course is subdivided into three areas of emphasis.
(a) A-V 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, to a greater depth on a seminar basis.** (PPHP-409, or permission of the instructor)
Class 2, Lab. 3, Studio 5, Credit 4

PPHP-511, 512, 513 Photographic Process Control
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 (PPHP-413, or permission of the instructor)
Class 2, Lab. 6, Credit 4

PPHP-521, 522, 523 Advanced Color Seminar
This course is designed to give the advance student an opportunity to work relatively independently to either develop his portfolio 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 and PPHP-313, or PPHL-313 and permission of instructor)
Class 2, Lab. 6, Credit 4

PPHP-541, 542, 543 Portrait Photography
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. (PPHG-203)
Class 2, Lab. 6, Credit 4

PPHP-551, 552, 553 Special Topics in 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.
Credit: Variable

COURSE DESCRIPTIONS / PROFESSIONAL PHOTOGRAPHY 223

PROFESSIONAL PHOTOGRAPHY

PPHM-301, 302, 303 Machine Processing
 Provides an opportunity for photographic students to gain an understanding of the mechanical, electrical, electronic, chemical, and production concepts of automated processing and finishing. Student will be involved with automated processing and finishing on a full production basis. (PPHS-201, 202, 203, or 21 credit hours of basic photography)
 Class 1, Lab. 8, Credit 4

PPHM-310 Survey of Machine Processing
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.
 Class 2, Credit 2

PPHM-320, 321 Mechanics of Photographic 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

PPHM-501, 502, 503 Training and Supervision of 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)
 Class 1, Lab. 8, Credit 4

PPHM-511, 512, 513 Advanced Machine Processing
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.
 Lab. 12, Credit 4

PPHP-301, 302, 303 Photography II
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. (PPHG-203)
 Class 3, Lab. 11, Credit 6

PPHP-311, 312, 313 Basic Color
 Color photographic image-making based on the study of color principles, color vision and color photographic materials 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 initially followed by extensive practice in negative-positive printing. The use of special processes and techniques is introduced in the final quarter. Coordination with Photography II (PPHP-301, 302, 303) provides realistic professional assignment applications.
 Class 2, Lab. 4, Credit 3

PPHP-407 A-V Preparations and Presentations
A survey of the problems involved in conceiving, constructing and exhibiting audio-visual productions. Special emphasis is placed on photographic techniques and how they relate to other phases of production.
 Class 2, Lab. 8, Credit 4

PPHP-408 Scientific and Technical Applications 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.
 Class 2, Lab. 8, Credit 4

PPHP-409 Corporate and Special Interest Publications
A survey of this type of publication with particular emphasis in the photographic problems involved. Skill building assignments to improve competence and an introduction into the problems of the art director, editor, printer, layout man, and writer form the basis of the course content.
 Class 2, Lab. 8, Credit 4



PPHS-731, 732, 733 Principles of Instrumental and Photographic Optics

The principles of geometrical and physical optics with application to photographic instrumentation systems. Geometrical optics-general laws, first-order imaging, aberrations and geometrical image evaluation, mirror and prism systems, the eye and vision characteristics, radiometry of optical images, basic instrument systems. Physical optics-Maxwell's equations, electromagnetic waves, polarization, interference and interferometers, coherence, Kirchoff integral and Huygen's principle, Fraunhofer and Fresnel diffraction, Fourier-transform formulation of diffraction, transfer-function description of imaging system performance.

Class 3, Credit 3

PPHS-741, 742, 743 Analysis and Evaluation 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 (Fall)

Class 3, Credit 3 (Winter and Spring)

PPHS-751, 752, 753 Special Topics in 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 Chairman of the Photographic Science Graduate Program.)

Credit 3

PPHS-890 Research and Thesis Guidance

Thesis based on experimental evidence obtained by the candidate in an appropriate field as arranged between the candidate and his advisor.

Credit 9 minimum for M.S.

**SCHOOL OF PRINTING
MANAGEMENT COURSES**

PPRM-201 Introduction to Technical Writing

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 Applications of Computers to
the Graphic Arts

A study of the applications of automated data processing, involving both tabulating systems and electronic computer systems, to 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

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. (GSSP-201)
Class 3, Credit 3

PPRM-305 Magazine Writing and Design

A discerning look at what goes on in the competitive and dynamic field of magazine publishing. An overview of the history, the business side, the editorial side, and the production side of the magazine industry.
Class 3, Credit 3

PPRM-401 Estimating I

A basic course embracing the principles and procedures for estimating the cost of printing by letterpress and offset lithography. Analysis of specifications. Planning for production. Costs of materials and outside services. Introduction to determining productive time. Hour costs and hour rates. Profit margin and pricing. (PPRT-311)
Class 3, Credit 3

PPRM-402 Estimating II

Further study in estimating printing costs with emphasis on determination of productive time allowances by operation. Sources of time cost data. Classification of operations and data. Standard times. Use of basic time schedules and procedures in their preparation and organization. (PPRM-401)
Class 4, Credit 4

PPRM-403 Printing Production Management I

An introductory study of the "art and science" of printing production management. Theory and practice of production organization, of industrial purchasing, of planning and controlling production, is covered. Students are introduced to inventory planning and control, and to work measurement.
Class 3, Credit 3

PPRM-404 Printing Production Management II

A continuing study of the production management function. The theory, practices, and applications of four subject areas are stressed: methods analysis, work measurement, quantitative inventory control methods, and engineering economic studies. An independent study project is usually required for this course. (PPRM-403 or equivalent)
Class 4, Credit 4

PPRM-501 Financial Control I

Introductory course in basic industrial accounting practices and procedures—the purely clerical work is minimized. Objective is an understanding of the elements, relationships, and uses of the classified Income Statement and Balance Sheet as they apply to manufacturing. The Cost of Manufacturing Statement.
Class 4, Credit 3

PPRM-502 Financial Control II

Financial statement analysis. Managerial use of accounting data. Printing industry financial ratios and their use. Cost accounting for printing. Standard Cost system. Budgeting principles and procedures applied to printing. Short- and long-range financial planning (PPRM-501)
Class 4, Credit 4

COURSE DESCRIPTIONS / PRINTING MANAGEMENT 229

PPRM-503, 504	Statistics of Quality Control I, II	PPRM-512	Collective Bargaining in the Graphic Arts
Fundamental concepts of statistics and the application of statistical methods to the control and investigation of processes and operations. (SMAM-201)		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 4, Credit 4		Class 3, Credit 3	
PPRM-505	Advertising Management	PPRM-513	Sales Management
A survey of the advertising industry and its relationship to printing. Advertising research, copywriting, media, and the social aspects of the advertising process.		Principles of effective printing sales management (the sales manager's job) are considered. These include planning, organizing, training, compensating, and motivating the sales force. Techniques and practices of creative salesmanship (the salesman's job) are analyzed, with study of such fundamental selling operations as handling objectives and closing. The psychological basis of selling is explored in depth.	
Class 4, Credit 4		Class 4, Credit 4	
PPRM-506	Business Law	PPRM-514	Newspaper Management
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.		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, 3, Credit 3		Class 4, Credit 4	
PPRM-509	Economics of Production Management	PPRM-515	Legal Problems of Publishing
Advanced study of the theoretical framework of production management, applying economic analysis. Study is made of cases involving actual managerial situations in areas such as demand for printing, cost analysis, pricing, and capital budgeting. Quantitative techniques are extensively employed. (GSSE-20X)		Legal aspects of newsgathering. 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		Class 4, Credit 4	
PPRM-510	Personnel Relations II	PPRM-590	Senior Seminar
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)		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 4, Credit 4		Class 3, Credit 3	
PPRM-511	Labor Relations in Graphic Arts	PPRM-599	Independent Study
Makeup and measurement of the labor force. History of organized labor. Wages, hours, union security, and other issues. Collective bargaining and contract negotiations emphasizing the printing industry. Labor law. (PPRM-302)		Student selects and develops independent study project of own design. Project and amount of credit assigned must be approved by Director of School of Printing.	
Class 4, Credit 4		Credit by arrangement	

TECHNICAL COURSES

- PPRT-201** **Typographic Composition**
In addition to learning to set type by hand the student will receive from this course an introduction to typography; from terminology to typeface recognition. By acquiring the basic knowledge of the conventional rules which stem from good traditional typography, the student can at a future date explore with a greater degree of understanding and assurance the new freedoms that are to be found in the latest typesetting methods. In addition, the production procedures of modern composing rooms will be discussed and observed in the laboratory.
Class 2, Lab. 3, Credit 3
- PPRT-202** **Machine Composition**
A course in hot metal machine composition. Study of the use, operation, and application of machine principles and mechanisms. Keyboard exercises in setting and casting type. Perforation of TTS tape. Introduction to phototypesetting.
Class 2, Lab. 3, Credit 3
- PPRT-203** **Layout and Printing Design**
Historical analysis of letter forms. Essential requirements and principles of layout and printing design as applied to commercial printing and advertising. Practical application of theory in solving printing design problems.
Class 2, Lab. 3, Credit 3
- PPRT-204** **Relief Press**
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, die cutting, scoring, numbering, perforating, embossing. Makeready methods for line and halftone printing. Pre-press preparation of various plates for printing. Introduction to flexographic printing.
Class 2, Lab. 3, Credit 3
- PPRT-205** **Gravure Printing**
Introductory course designed to survey the gravure printing process and the study of related information regarding applications, techniques, equipment, materials and supplies. Course conducted by means of lectures, class discussions, demonstrations and supervised laboratory exercises.
Class 2, Lab. 3, Credit 3
- PPRT-206** **Reproduction Photography**
A basic course in the fundamental principles, procedures, techniques, and applications of the photographic process as it is related to the production of negatives for the major printing processes.
Class 2, Lab. 3, Credit 3
- PPRT-207** **Printing Plates**
Introductory course in the elements of platemaking procedures for letterpress, flexographic, and lithographic plates; gravure cylinders, and electronically engraved plates. Theoretical study plus practical involvement in making of various plates.
Class 2, Lab. 3, Credit 3
- PPRT-208** **Lithographic Press**
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**
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 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-301** **Typographic Composition**
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

COURSE DESCRIPTIONS / PRINTING TECHNOLOGY 231

PPRT-302 Photocomposition Systems

Detailed study of photocomposition with emphasis on systems approach. Introduction to use of computers in composing rooms, and operation of specialized equipment. Field trips. (PPRT-202)

Class 2, Lab. 4, Credit 3

PPRT-303 Layout and Printing Design

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

A study of pressroom problems in letterpress printing on cylinder press equipment. Commercial forms, single color and multicolor work. Make ready system. Operation and care of equipment. (PPRT-204)

Class 2, Lab. 6, Credit 4

PPRT-305 Gravure

Laboratory and technical course embracing the theories and practices of gravure presswork using sheet-fed presses. Demonstrations and class use of three-unit web press will also be incorporated. Study of related information on techniques, equipment, materials, and supplies.

Class 2, Lab. 3, Credit 3

PPRT-306 Tone Reproduction Photography

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 half tone sensitometry and process control. (PPRT-206)

Class 2, Lab. 3, Credit 3

PPRT-307 Lithographic Plates

An advanced lithographic plate course covering the theory and practice of all types of litho plates; their processing, problems, controls, and applications in the industry. Included are related plate department operations such as step and repeat, and work with roomlight-contact films.

Class 2, Lab. 3, Credit 3

PPRT-308 Lithographic Press Problems

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

Further study of the theory and practice of screen printing covering areas such as experiments with fabrics for screens; stencil forming materials and the effects these have on a 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

An introduction to the technological requirements involved in producing relief printing plates. Original and duplicate plate characteristics are considered in light of typical production needs. Chemical, mechanical, and electronic processes are discussed and illustrated in lecture and laboratory experiences.

Class 2, Lab. 3, Credit 3

PPRT-311 Imposition and Finishing

Theory and practice of imposition of various kinds of forms. Imposition planning as related to and governed by folding and other finishing operations. Imposition and lockup principles and procedures for letterpress forms.

Class 4, Credit 4

PPRT-312 Stripping

Examination and treatment of negative and positive films to remove defects; study and application of various methods of assembling film negatives or positives into flats in preparation for platemaking; study of proofing systems and types of impositions.

Class 2, Lab. 3, Credit 3

232 COURSE DESCRIPTIONS / PRINTING TECHNOLOGY

PPRT-313 Copy Preparation
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. (PPRT-203)
Class 2, Lab. 6, Credit 4

PPRT-314 Flexography
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
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 2, Lab. 6, Credit 4

PPRT-316 Production for Book Publishing
A study of the procedures utilized in the modern production of books, from the viewpoint of both publishing firms and book manufacturers. The structure of the publishing industry is analyzed, along with each step in the production of a book, from manuscript to bound copy.
Class 3, Credit 3

PPRT-317 Calligraphic Forms
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
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
A study of methods of producing a newspaper by both the letterpress and the lithographic processes. Uses of hot type and cold type composition. Newspaper make-up procedures in hot type as well as paste-up methods with the use of cold type. A review of basic camera, stripping, plate, and press operations. (PPRT-319)
Class 2, Lab. 3, Credit 3

PPRT-321 Web Offset
An analytical study of the technological developments in web offset. Emphasis on the interrelationship of procedures, materials, and equipment. Principles of quality control and problem solving. Practical laboratory projects on a commercial four-unit perfecting web offset press. (PPRT-208)
Class 2, Lab. 3, Credit 3

PPRT-401 Typographic Workshop
Principles of typography applied to individual projects, depending upon the educational objectives of each student. Opportunity is allowed for complete use of the facilities of the Typographic Composition Laboratories. (PPRT-301)
Class 2, Lab. 6, Credit 4

PPRT-402 Applications of Electronics to Graphic Arts
A basic course in fundamentals of electricity and electronics as related to the graphic arts field. The concepts in use of modern equipment and devices, such as sensing, detecting, control, and production will be emphasized.
Class 4, Credit 3

PPRT-403 Layout and Printing Design
 A project course with design problems which involve the student in converting his 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
 Color separation and color correction methods in the graphic arts industry. Color theory, masking requirements, tone reproduction for color, color proofing systems, electronic scanners. (PPRT-306)
 Class 2, Lab. 3, Credit 3

PPRT-410 Printing Surfaces
 A study of the interrelationships of inks, substrates, and printing processes. Emphasis is placed upon ink and paper manufacturing; physical and optical properties of materials; testing; problem-solving.
Class 2, Lab. 3, Credit 3

PPRT-501 Development of Printing Types
 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
 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
 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
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
Course offered for Photography students. Theory and practice of the methods of relief, planographic, flexographic and intaglio processes.
Class 2, Lab. 3, Credit 3

College of Science

Course Descriptions

BIOLOGY DEPARTMENT

Note: Quarter offered follows course description in brackets; F—Fall; W—Winter; S—Spring; SR—Summer

SBIB-559 Special Topics - Biology
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. Offered every quarter.
Class variable, Credit variable

SBIB-599 Independent Study - Biology
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
Detailed study of the structure and function of normal and abnormal vertebrate tissue. (SBIG-201) [S, SR]
Class 2, Lab. 4, Credit 4

SBIC-401 Immunohematology
Composition of blood, blood groups, and the chemistry and immunology of blood-like substances. Structure of hemoglobin, chemical and physical properties of the red cell membrane. 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 2, Lab. 3, Credit 3

SBIC-402 Immunology
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. (SBIC-404) [S, SR]
Class 2, Lab. 3, Credit 3

SBIC-403 Advanced Cellular Biology
An in-depth study of the structure and physiology of membrane bound organelles, molecular genetics, and the biochemistry of genetic events. (SBIG-203, SCHB-301) [F, W]
Class 3, Lab. 3, Credit 4

SBIC-404 Introductory Microbiology
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, SCHG-217) [F]
Class 3, Lab. 4, Credit 5

SBIC-405 Medical Microbiology
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
Molecular biology, chemistry, epidemiology and clinical aspects of viruses: morphology, genetics, immunology, environmental effects; methods of isolation, cultivation, identification; assays. Human virus diseases. (SBIC-402, SBIC-404, SCHB-301) [W, S]
Class 4, Credit 4

DEVELOPMENTAL, GENETIC &
ENVIRONMENTAL BIOLOGY

SBID-240 General Ecology
Introduction to ecosystem ecology stressing the dynamic interrelationships of plant and 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) [S]
Class 3, Lab. 3, Credit 4

SBID-420 Plant Ecology
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) [S, SR]
Class 2, Lab. 6, Credit 4

SBID-421 Genetics
Genes and cytoplasmic factors as units of inheritance; the nature and origin of inheritable characteristics and variations. Principles of inheritance in plants, animals, and man. (SBIG-203) [S]
Class 3, Lab. 3, Credit 4

SBID-422 Developmental Biology
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) [F, W]
Class 2, Lab. 6, Credit 4

GENERAL BIOLOGY

SBIG-201, 202, 203 General Biology
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. [SBIG-201 – F; SBIG-202 – W; SBIG-203 – S]
Class 3, Lab. 3, Credit 4

SBIG-210 Human Biology I
The fundamental processes of living organisms with particular emphasis on the cause, nature, and impact of some of the common diseases and malfunctions of the human body. [F]
Class 4, Credit 4

SBIG-211, 212 Human Biology II, III
An introduction to the structure and function of the human body. The laboratory exercises are designed to demonstrate some of the physiological functions which take place in the human body and include exercises in basic histological technique. [211-W, 212-S]
Class 3, Lab. 3, Credit 4

SBIG-213 Biology of Human Reproduction
The study of the anatomy, functioning and diseases of the human reproductive systems. An introduction to human heredity, inherited diseases, and birth defects.
Class 4, Credit 4

SBIG-300 Biological Literature
Use of libraries as a source of scientific information. Classification of scientific literature into original and secondary sources and techniques for making accurate literature searches. Discussions of journals, bibliographies, technical journals, and abstracts used in preparation of technical literature reports. Preparation of a literature research report. [F, W]
Class 2, Credit 2

SBIG-400 Human Ecology
The ecological problems of man, emphasizing natural resources, food production, pollution, pest control, population, and the ecological implications thereof. (SBIG-210) [F]
Class 3, Credit 3

SBIG-440 Environmental Microbiology
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
Biology of invertebrate animals with reference to classification, structure, function, and ecology. (SBIG-203) [W, S]
Class 3, Lab. 3, Credit 4
- SBIO-302 Vertebrate Zoology
Morphology, physiology, classification, and ecology of chordates. (SBIG-203) [W, S]
Class 3, Lab. 3, Credit 4
- SBIO-303 Comparative Vertebrate Anatomy
A comparative study of the organ systems of representative members of the vertebrates with emphasis on structural change which occur during evolution. (SBIG-203) [F, W]
Class 3, Lab. 3, Credit 4
- SBIO-304 Botany
Structure and function of root, stem, and leaf; relation of plants to soil, sunlight, and water. Distribution of the major groups of plants and their adaptation to their particular environment. (SBIG-203) [F, W]
Class 3, Lab. 3, Credit 4
- SBIO-305, 306 Physiology and Anatomy
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-203, SCHG-217) [305–W, 306–S]
Class 3, Lab. 3, Credit 4
- SBIO-410 Plant Physiology
Physiological phenomena in the growth and development of higher plants. Water relationships, photosynthesis, translocation, mineral nutrition, growth, hormonal control, and reproduction. (Minimum of 10 credits in biological science.) [F, W]
Class 3, Lab. 6, Credit 5
- SBIO-411 Systematic Botany
Study of diversity existing in vascular plants, its origin and its organization into a hierarchy 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, SR]
Class 2, Lab. 6, Credit 4

SBIO-412 Parasitology
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 Physiology
A comparative study of the physiological mechanism of a selected group of animals with particular emphasis on circulatory, respiratory, excretory and neuromuscular phenomena. (SBIG-203) [W, S]
Class 3, Lab. 3, Credit 4

BIOLOGICAL TECHNIQUES

SBIT-430 Radiation Biology
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, W]
Class 2, Lab. 6, Credit 4

SBIT-431 Histological Technique
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-203) [W]
Class 1, Lab. 4, Credit 3

SBIT-432, 433 Biology Laboratory Techniques
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–W, 433–S]
Class 2, Lab. 6, Credit 4

SBIT-541, 542, 543 Biology Research
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

CHEMISTRY DEPARTMENT

Note: Quarter offered follows course description in brackets; F – Fall; W – Winter; S – Spring; SR – Summer

SCHA-311 Analytical Chemistry - Instrumental

Analysis

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-213) [F]

Class 3, Lab. 4, Credit 4

SCHA-312 Analytical Chemistry - Separations

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-213) [W]

Class 3, Lab. 4, Credit 4

SCHA-511 Instrumental Analysis

Theory, applications and limitations of instrumental methods in qualitative, quantitative, and structural analysis. Topics covered include fluorescence and phosphorescence, Raman, mass spectrometry, nuclear magnetic resonance, X-ray and radiochemistry, and electrochemistry. (SCHP-313) [F, W]

Class 3, Lab. 5, Credit 5

SCHA-512 Advanced Analytical Chemistry

Theories underlying analytical methods, trace analysis, new instrumental techniques, organic quantitative analysis and non-aqueous titrimetry. Project oriented laboratory optional. (SCHP-313) [S]

Class 3, Lab. 3, Credit 3 or 4

SCHB-301,302 Biochemistry

An introduction to the fundamental aspects of biomolecules. This first quarter stresses the structural parameters, chemical and physical properties, and functional aspects of proteins, enzymes, carbohydrates, lipids and nucleic acids. The second quarter considers intermediary metabolism of carbohydrates, lipids, and proteins. Also included is an introduction to bioenergetics. (SCHO-232) [301 – F, 302 – W]

Class 3, Lab. 6, Credit 5

SCHB-555 Biochemistry

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. (SCHP-442, SCHO-433) [SR, F]

Class 3, Credit 3

SCHB-556 Biochemistry – Nucleic Acids & Molecular Genetics

The biochemistry of inheritance, expression of genetic information, protein biosynthesis, differentiation, viral and bacterial infection and the "origin of life". (SCHB-555) [W]

Class 3, Credit 3

SCHB-557 Biochemistry-Metabolism

Bioenergetics principles; catabolism of carbohydrates, fatty acids and amino acids; photosynthesis, biosynthesis of carbohydrates, lipids, and nitrogenous compounds; active transport; metabolic diseases. (SCHB-555) [S]

Class 3, Credit 3

SCHC-211, 212, 213 General Chemistry

For Chemistry majors and others who desire an in-depth study of general chemistry. Atomic structure, chemical bond, properties of elements and compounds; states of matter; solutions; acids and bases; oxidation-reduction reactions; chemical calculations. Qualitative and quantitative analysis. [211 – F; 212 – W; 213 – S]

Class 3, Lab. 7, Credit 5

SCHC-401 Chemical Literature

Organization of technical libraries, classification of scientific literature into original and secondary sources and techniques for making literature searches. Use of card catalog, index, abstracts, monographs, handbooks, critical tables, journals, bibliographies, technical catalogs, and patents. Preparation of literature research reports. (SCHO-431, SCHP-441) [F, W]

Class 2, Credit 2

SCHC-541, 542, 543 Chemistry Research

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

SCHC-559 Special Topics - Chemistry
 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

SCHC-599 Independent Study - Chemistry
 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

SCHG-205, 206, 207 Chemical Principles
 For Photo science, Mathematics, and Physics majors. Chemical principles are discussed with an emphasis placed on problem solving. Topics include atomic structure, chemical equilibrium, oxidation-reduction, electrochemistry, thermodynamics, organic chemistry and instrumental methods of sample analysis. Laboratory experiments are design to complement the lecture material. [205-F; 206-W; 207-S]
 Class 3, Lab. 3, Credit 4

SCHG-208, 209 College Chemistry
 For engineering students. The concept 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-215, 216, 217 General & Analytical Chemistry
 Principles of chemistry presented for students in medical technology and life sciences; laboratory emphasis: inorganic chemistry, separations techniques, quantitative analysis. [215-F, Class 3, Lab. 3, Credit 4] [216-W, Class 3, Lab. 3, Credit 4] [217-S, Class 3, Lab. 6, Credit 5]

SCHG-271 Chemistry of Water
 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
 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
 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. [281-F; 282-W; 283-S]
 Class 3, Lab. 2, Credit 4

SCHI-551, 552 Inorganic Chemistry
 The properties and structures of the elements and their compounds in relation to electronic and stereochemical principles; inorganic lab techniques. (SCHO-433, SCHP-443) [551-S, SR; 552-F, W]
 Class 3, Lab. 3, Credit 4

SCHO-221 Organic Chemistry
 An introduction to the major classes of organic compounds including familiarization with the structures, nomenclature and properties of typical members. Laboratory work consists of techniques for separation and characterization. (SCHG-206 or SCHG-216) [S]
 Class 3, Lab. 3, Credit 4

SCHO-231, 232 Organic Chemistry
 Types of organic compounds, names, and structures, preparations, properties, and reactions. Laboratory work emphasizes techniques; involves preparations and analysis. (SCHG-216 or SCHG-206) [231-F; 232-W]
 Class 3, Lab. 3, Credit 4

SCHT-242 Chem Tec II
Formation of molecules and ionic compounds, sampling techniques, sample preparation, gravimetric and titrimetric analysis, measurement of pH. [W, S]
Class 4, Lab. 9, Credit 7

SCHT-243 Chem Tec III
Oxidation and reduction, coordination compounds, classes and reactions of organic compounds, infrared spectrophotometry. [F, SR]
Class 3, Lab. 9, Credit 6

SCHT-244 Chem Tec IV
Continuation of classes and reactions of organic compounds, kinetics, nuclear magnetic resonance and ultra-violet spectrophotometry, mass spectrometry atomic absorption. [W, S]
Class 2, Lab. 9, Credit 5

SCHT-251 Mathematics for the Technologist

This course will be taught by the Chemistry Faculty and will form an integral part of the laboratory experiments that are conducted in the Chem Tec courses. Topics will be covered as they appear in the experimentation. Suggested topics for this course include slide rule operation, the use of significant figures, accuracy and precision, errors and dimensional analysis, concentration in terms of molarity, normality, stoichiometry, preparation of standard curves. [F]

Class 4, Credit 4

SCHT-305, 306 Chemistry Specialty
The final academic year 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 familiarization with biological laboratory techniques. [305-F, SR; 306-W, S]

Class 2, Lab. 6, Credit 4

SCHT-307, 308 Research Familiarization
A chemical technician does exploratory work following general directions with little or no formal supervision and is often encouraged to innovate after con-

sultation with his 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; 308-W, S]

Lab. 9, Credit 3

SCHT-309 Glassblowing Techniques
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

MATHEMATICS DEPARTMENT

Note: Quarter offered follows course description in brackets; F-Fall; W-Winter; S-Spring; SR-Summer

SMAM-201, 202, 203 Algebra, Trigonometry, and Analytic Geometry

A course in college algebra and trigonometry and a study of selected topics in analytic geometry. [201-F; 202-W; 203-S]

Class 3, Credit 3

SMAM-204 Modern Algebra
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 Freshman Seminar
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.
Class 1, Credit 1

SPSP-205, 206, 207

General Physics

General physics for engineering students. Mechanics, heat, sound, and electricity and magnetism, making moderate use of the calculus. (Coregistration or credit in SMAM-252, 253) [205–W; 206–S; 207–F]

Class 3, Lab. 2, Credit 4

SPSP-211, 212, 213

College Physics

An elementary course in college physics. Mechanics, heat, sound, light, and electricity and magnetism, with some elements of modern physics. (SMAM-201) [211–F; 212–W; 213–S]

Class 3, Lab. 2, Credit 4

SPSP-214, 215, 216

Physics for Graphic Arts

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, Lab. 2, Credit 4

SPSP-301

Electronics for Technologists

A laboratory-oriented course to provide the scientific 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

An intensive course in general physics, using calculus, for majors in the sciences. Mechanics, heat, sound, electricity and magnetism, and light. (Co registration or credit in SMAM-252, 253) [311–F, W; 312–W, S; 313–F, S]

Class 4, Lab. 3, Credit 5

SPSP-314, 315 Introduction to Modern Physics

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-251, SPSP-207, SPSP-313) [314–W; 315–S]

Class 4, Credit 4

SPSP-319

Electrical Processes in Solids

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

Elementary Physical Analysis

Introduction to measurement theory and experiment design. Gaussian and non-Gaussian distributions, standard deviation, propagation of uncertainties, experiment design and evaluation, empirical determination of functional relationships, method of least squares. (SMAM-253 and coregistration or credit in SPSP-312) [W]

Class 3, Credit 3

SPSP-341 Foundations of Scientific Thinking

Definition of Science; historical perspective; ingredients of the scientific quest; the scientific method; scientific explanation, laws, theories, and hypotheses; the role of mathematics; probability and induction; science and other disciplines. (At least a year of basic science at the college level.) [F, W]

Class 2, Credit 2

SPSP-351, 352, 353

Radiation Physics

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) [341–F; 342–W, 343–S]

Class 4, Lab. 3, Credit 5

SPSP-401, 402

Intermediate Mechanics

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, W; 402–S, SR; 1973-4 and alternate years]

Class 4, Credit 4

SPSP-411, 412

Electricity and Magnetism

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-306, SPSP-313) [411–F; 412–S; 1974-5 and alternate years]

Class 4, Credit 4

COURSE DESCRIPTIONS /SCIENCE /PHYSICS 245

SPSP-415 Thermal Physics
 Fundamental principles of classical thermodynamics, kinetic theory, statistical mechanics, and low temperature physics. Applications to physical problems. (SMAM-306, SPSP-313) [F] [1973-4 and alternate years]
Class 4, Credit 4

SPSP-421, 422 Experimental Physics
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 coregistration 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
 Laboratory course in electrical and electronic measurements and instrumentation, with theory of electron emission, electron tubes, and solid state devices as needed. (SPSP-312, SPSP-321) [431 –F, 432 –S]
Class 2, Lab. 3, Credit 3

SPSP-455 Optical Physics
Introduction to wave phenomena as applied to the electromagnetic spectrum. Interaction of radiation with matter. (SMAM-305, SPSP-313) [F] [1974-5 and alternate years]
Class 4, Credit 4

SPSP-501 Theoretical Physics
Application of advanced mathematical methods to physics. (SMAM-307 plus coregistration or credit in SPSP-402 or SPSP-412) [S]
Class 5, Credit 5

SPSP-521 Advanced Experimental Physics
 Advanced laboratory experiments and projects in atomic physics, nuclear physics, or solid state physics. Special emphasis on experimental research techniques. (SMAM-307, SPSP-421, coregistration or credit in SPSP-552) [F]
Lab. 6, Credit 2

SPSP-531, 532 Solid State Physics
 The structure of solids and their mechanical, thermal, electrical, and magnetic properties. (SMAM-307, SPSP-552) [531 –S; 532 –offered upon sufficient request]
Class 4, Credit 4

SPSP-541, 542, 543 Physics Research
 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
 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 Mechanics
 Elements of relativistic mechanics and of wave mechanics, quantum theory, Schroedinger's equation and its solutions, atomic spectra and atomic structure. (SPSP-315, SPSP-402, SPSP-412, SPSP-415, SPSP-455, SPSP-501) [F]
Class 4, Credit 4

SPSP-553 Nuclear Physics
 Radioactivity, nuclear reactions, nuclear structure, elementary particles. (SPSP-552) [S] •
Class 4, Credit 4

SPSP-559 Special Topics - Physics
 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

SPSP-599 Independent Study - Physics
 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
Course Descriptions

Department of
Computer Science
and Technology

ICSP-201 Computer Techniques
BASIC programming techniques using remote time sharing terminals, topics include log-on, log-off procedures, job control, BASIC coding methods and using the computer to solve applied problems.
Class 2, Credit 2

ICSP-205 Computer Techniques
Introduces the technical student to various facets of computing systems, with predominant emphasis on digital computers. Concentration will be on the FORTRAN IV language, plotting, use of application programs, documentation, elementary error analysis, and working knowledge thereof. Other topics to be briefly discussed will be digital vs. analog computers, storage techniques, data manipulation, and real time applications.
Class 3, Credit 3

ICSP-206 Mathematics of Computing
Numerical solutions of linear equations and inequalities; development of algorithms for iterative methods; series approximations and calculations of areas, mathematical logic and switching circuits; problems for computer solution.
Prerequisites: ICSP-205 and SMAM-251
Class 3, Credit 3

ICSP-209 Introduction to
Data Systems
Data processing systems topics include: unit record, card, tape and disk computer systems. Real time, batch programming, data communication systems are also covered. Emphasis is placed on system components, configuration and design with examples from various business applications.
Class 4, Credit 4

ICSP-215 Programming Language—
FORTRAN
FORTRAN programming techniques and applications; topics include FORTRAN constants, variables, expressions, functions, logical operations, storage allocations, statements, I/O manipulation, program structures, subprograms, diagnostic methods and applied problem solving methods.
Prerequisite: ICSS-200
Class 4, Credit 4

ICSP-220 Programming
Techniques
Applied computer programming techniques, topics include advanced FORTRAN programming, numerical methods and applications of computers to engineering problems.
Prerequisite: EEEE-201
Class 4, Credit 4

ICSP-301 COBOL Programming
COBOL programming techniques and applications; topics include construction and use of flowcharts, COBOL coding methods, data processing and file manipulation. Laboratory problems to be solved using the computer.
Prerequisites: Programming experience in FORTRAN or BASIC
Class 4, Credit 4

ICSP-302 Computer Applications in
Engineering Problems
Computer techniques applied to electrical engineering technology problems, topics include review of programming language teleprocessing concepts, linear systems, computer aided circuit analysis and computer aided circuit design techniques.
Prerequisite: FORTRAN Programming
Class 1, Credit 1

248 COURSE DESCRIPTIONS / COMPUTER SCIENCE

ICSS-320 Data Structure Analysis

Data structures; topics include linear and orthogonal lists, doubly linked lists, tree structures, storage allocation and collection, list processing, data management. Laboratory problem solving is emphasized.

Prerequisite: ICSP-305

Class 4, Credit 4

ICSS-321 Sorting and Searching Techniques

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.

Prerequisite: ICSS-320

Class 4, Credit 4

ICSS-340 Finite State Machine
and Automata

Principles of finite state machine 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.

Prerequisite: ICSS-210

Class 4, Credit 4

ICSS-400 Logical Design

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.

Prerequisite: ICSS-211

Class 4, Credit 4

ICSS-420 Communication and Data
Based Systems

Data communication and data based system analysis; topics include network analysis, design, cost; exchanges, concentrators, multiplexors, buffering, reliability, tariff, common carrier implications.

Prerequisites: ICSS-211

Class 4, Credit 4

ICSS-430 Numerical Methods

Numerical methods using computers; topics include algorithms, zeros of functions, numerical integration, finite differences and interpolation, solutions of systems of equations, matrices, least squares curve fitting, elementary differential equation solution, error analysis and random processes.

Prerequisites: SMAM-214, ICSP-215 or ICSP-205

Class 4, Credit 4

ICSS-440 Operating Systems

Computer operating systems, topics include general concepts related to design and implementation of operating systems, table management and associated storing, queuing algorithms, searching, addressing mechanisms, hardware-software combinations, interrupt processing, relocation, memory protection, over-lapping, peripheral processing, subroutine and library organization and loader considerations, introduction to microprogramming, batch, multiprogramming, time sharing systems and virtual storage systems.

Prerequisite: ICSS-320

Class 4, Credit 4

ICSS-450 Computing Management

Principles of computer system management, topics include interaction between computer systems and organizations from behavioral, economic, technical, and societal viewpoints. The influence and effects of individuals; personnel selection and management. Economic analysis of computer systems; a functional approach to decision analysis, including linear programming and Bayesian decision processes. Project planning and implementation; information systems. Effects on society; the computer utility.

Prerequisite: Must be a fourth or fifth year student

Class 4, Credit 4

ICSS-480 Formal Languages

Computers formal language principles; topics include context free, context sensitive grammar, regular expressions, touring machine, introduction to unsolvability and computability.

Prerequisite: ICSS-340

Class 4, Credit 4

COURSE DESCRIPTIONS / COMPUTER SCIENCE 249

ICSS-510 Systems Workshop
 It is anticipated that these workshops, or a portion of them, will be taken in conjunction with the co-op experience. The subject or thesis topic assigned for this on-the-job type activity will be determined in conjunction with the co-op employer. An appropriate final "report" and an oral "design review" with the employer's representative will serve as the basis for grading.
 Prerequisite: Must be a fourth or fifth year student.
 Class 4, Credit 4

ICSS-S25 Assemblers, Interpreters and Compilers
 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.
 Prerequisite: ICSS-320
 Class 4, Credit 4

ICSS-530 Discrete Simulation
 Computer simulation techniques; topics include abstract properties of simulations, modeling, and analysis of a simulation run. Topics in 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.
 Prerequisites: SMAM-309 and a programming language
 Class 4, Credit 4

ICSS-545 **Microprogramming**
 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.
 Prerequisites: ICSS-210 and ICSP-305
 Class 4, Credit 4

ICSS-550 Review of Computer Science
 Review of significant advances in computer science which have occurred in the last few years—designed to give graduating or upperclass students an overview of recent technological and theoretical advances. (Normally taken during the last quarter of school.)
 Prerequisite: Must have fifth year standing
 Class 4, Credit 4

ICSS-555 Real-time Computation
 Principles and applied problems in real-time computation topics including processor subsystem, 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.
 Prerequisites: ICSS-210 and ICSP-215
 Class 4, Credit 4

ICSS-575 Minicomputer Systems and Applications
 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.
 Prerequisite: Fourth year standing and a grade point average of C or better.
 Class 4, Credit 4

ICSS-580 Systems Programming
 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.
 Prerequisite: ICSP-305
 Class 4, Credit 4

ICSS-585 System Programming Laboratory
 A follow-up study of Systems Programming to provide actual experience on a computer system.
 Prerequisite: ICSS-580
 Class 4, Credit 4

250 COURSE DESCRIPTIONS / PACKAGING SCIENCE

ICSS-590 Seminar in Computer Science
Current advancement in computer science Topics selected include telecommunications, operating systems, sorting, systems analysis, virtual storage microprogramming and others.
Prerequisite: Must be a fourth or fifth year student
Class 2-4, Credit 2-4

ICSS-599 Independent Study
Selected topics between a student and a faculty member.
Prerequisite: Fifth year standing with an average higher than 2.5
Credit 2-4

Department of Packaging Science

Course Descriptions

IPKP-200 Introduction to Packaging
An overview of the field of packaging. Topics will include the historical development of packaging economic importance, social implications the functions of a package, and packaging as a profession.
Class 2, Credit 2

IPKP-201 Principles of Packaging
Materials, processes, and technology employed to protect goods during handling, shipment, and storage. A brief review of materials and container types; package design and development; and research and testing will be presented.
Class 3, Credit 3

IPKP-301 **Packaging Materials and Processes**
The manufacture, properties, uses, and testing of all common packaging materials and components Opportunities for reuse, recycling, and proper disposal will be discussed.
Class 2, Lab. 4, Credit 4

IPKP-401 Packaging Equipment and Systems
Package making and filling machinery available, plus handling and conveying equipment. The characteristics and maintenance of different types of equipment will be studied, and students will gain practice in setting up complete lines for packaging various products.
Class 2, Lab. 4, Credit 4

IPKP-421 Package Environment and Testing
An exploration of the different shipping, storage, and use environments common to various products and packages. Structural design of packages to protect products, and methods to test package effectiveness and predict shelf life in these environments will be studied. Package design in relation to solid waste disposal and material and energy shortages will be stressed.
Class 2, Lab. 4, Credit 4

IPKP-501 Package Development and Marketing
The interrelationship between these two activities, detailing how the retail package should 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.
Class 2, Lab. 4, Credit 4

IPKP-590 Senior Thesis
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

IPKP-599 Independent Study
Independent study, in consultation with the instructor, on any packaging-related topic.
Arranged, Credit variable

COURSE DESCRIPTIONS / ELECTRICAL ENGINEERING TECHNOLOGY 253

ITEE-402 **Circuit Theory II**
 Frequency response of network functions by use of pole-zero diagrams. Bode diagrams of network functions. Fourier series solution of circuits with non-sinusoidal inputs. Two port network theory and application.
 Class 3, Lab. 2, Credit 4

ITEE-404 **Control Systems I**
 Analysis of closed loop control system using Routh's and Nyquist's stability criteria. Determination of steady-state error, phase and gain margin and static error coefficients. Lead and lag compensating networks and their applications.
 Class 3, Lab. 3, Credit 4

ITEE-411 **Electrical Principles for Design I**
 Basic course in electrical circuits for mechanical technology students. Solution of D.C. and A.C. circuits, including basic network theorems. Concepts of electromechanical energy conversion including D.C. machines, polyphase circuit and power transmission.
 Class 3, Lab. 3, Credit 4

ITEE-412 **Electrical Principles for Design II**
 A continuation of ITEE-411. Topics covered include A.C. machines, transformers, power rectifiers, basic principles of electronic amplifiers and electronic control systems.
 Class 3, Lab. 3, Credit 4

ITEE-414 **Basic Electrical Principles**
 Basic industrial power distribution systems. Single and three phase power, power measurement and power factor. Other topics include: motors and their operating characteristics, power consumption and economic considerations, principles of electric transducers.
 Class 3, Lab. 3, Credit 4

ITEE-424 **Logic and Digital Devices**
 Analysis and simplification of logic equations using Boolean Algebra to semiconductor, fluidic, pneumatic, and relay logic devices. Karnough and Quine McClusky reduction technique, and truth tables. Transformation from logic equations to standard logic units, the operation and hazards of sequential circuits.
 Class 3, Lab. 3, Credit 4

ITEE-428 **Linear Amplifier Design**
 Design of transistor amplifiers for specific low frequency, high frequency, and transient response. Single and cascaded band-pass amplifiers including compensated video amplifiers, staggered tuned amplifiers, and feedback systems. Design of transistors bias networks to meet specific circuit requirements.
 Class 3, Lab. 3, Credit 4

ITEE-520 **Electrostatic and Magnetic Fields**
 Basic principles of electrostatic fields including vector analysis, Coulomb's law, field intensity, and energy. Steady state magnetic field fundamentals including Ampere's law, magnetic flux and flux intensity. Basic magnetic circuit design.
 Class 4, Credit 4

ITEE-521 **Electromagnetic Fields and Antennas**
 Time varying fields and Maxwell's equations. Characteristic impedance and radiation pattern of the dipole antenna. Design of antenna arrays for UHF/VHF application. Microwave antenna design.
 Class 3, Lab. 2, Credit 4

ITEE-524 **Microwave Systems**
 Microwave power sources and waveguide transmission systems. Measurement of standing waves, impedance, and power flow in waveguides. Solid state microwave devices. Microwave communication system design.
 Class 3, Lab. 3, Credit 4

ITEE-526 **Semiconductor Physics**
 A study of the physics of semiconductors including elementary quantum mechanics, band theory, and conduction processes in semiconductors. Derivation of transistor parameters from the physical model. Hall effect devices and their application. Principles of lasers and masers.
 Class 4, Credit 4

ITEE-532 **Power Amplifier Design**
 Design of class A and B low frequency power amplifiers including distortion analysis and feedback. Class C R.F. power amplifier design using transistors. Thermal considerations for power transistors and heat sink design.
 Class 3, Lab. 3, Credit 4

ITEE-534 Communication Systems I

Basic A.M. and F.M. modulation systems and their spectrum. Design of circuits for the generation and detection of modulated carriers. Pulse modulation systems and sampling techniques.

Class 3, Lab. 2, Credit 4

ITEE-535 Communication Systems II

Fourier series and Fourier transform. Spectrum analysis of various modulation systems. Performance of systems in the presence of noise. Basic information theory and coding.

Class 4, Credit 4

ITEE-536 Control Systems II

Design of control systems for specific application and performance criteria. A study of control motors and components for D.C. and A.C. control systems. Application of control theory to the solution of practical system problems.

Class 3, Lab. 2, Credit 4

ITEE-538 Digital Computer Design I

Design of logic circuits using 7400 series TTL gates. A study of flip-flops, one shot multivibrators and MSI. Design of arithmetic circuits, shift registers and counters. Core memories and their applications.

Class 3, Lab. 2, Credit 4

ITEE-539 Digital Computer Design II

Continuation of ITEE-538. Applications of logic circuits to computer design. Operation of computers and computer systems. Machine language. Programming, indexing and indirect addressing. Peripheral devices and time sharing.

Class 3, Lab 2, Credit 4

ITEE-540 Pulse Circuit Design

Response of R-C circuits to pulse and square waves. Switching characteristics of transistors; rise time, fall time, 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.

Class 3, Lab. 2, Credit 4

**ITEE-544 Integrated Circuit Theory
and Applications**

Review of basic semiconductor theory and transistor fundamentals. Fabrication processes and circuit characteristics of monolithic semiconductors. Basic integrated circuits and circuit analysis.

Class 3, Lab. 2, Credit 4

ITEE-546 Industrial Electronics

Design of SCR/Triac control circuits for D.C. and A.C. motors. Control of lights and heating elements. 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.

Class 3, Lab. 2, Credit 4

ITEE-548 D.C. and A.C. Machine Design

Principles of operation, construction, and application of A.C. and D.C. rotating machines. Special emphasis on A.C. synchronous, A.C. induction, D.C. shunt, and A.C. single-phase motors and rotating devices which find widespread application in control systems.

Class 3, Lab. 3, Credit 4

ITEE-550 Power Systems

Derivation and use of per-unit quantities and symmetric components. Inductance and capacitance of three-phase transmission lines. Symmetric component representation of transformers. Load/flow studies.

Class 3, Lab. 2, Credit 4

ITEE-551 Protective Relaying

Physical construction and characteristics of electromechanical and solid-state relays. Short circuit calculations. Line, bus, and transformer protection.

Class 3, Lab. 2, Credit 4

ITEE-552 Power System Stability

Lightning and switching characteristics. Travelling waves on transmission systems. Shielding and arrester protection. Transient characteristics of machines. System Stability.

Class 4, Credit 4



ITEE-554 Electronic Optic Devices

Basic units for measuring radiated energy. Laser and light emitting diode operating theory. Characteristics of solid state light sensors. Optical systems in industry. Basic principles of hologram generation.
Class 3, Lab. 2, Credit 4

ITEE-556 Transmission Lines and Filters

General transmission line equation and approximations. Lossless transmission line and analysis using the Smith chart. Matching stub design for transmission lines. Pole-Zero filter design principles and applications.
Class 3, Lab 3, Credit 4

ITEE-580 Senior Project

Selected independent study or design project by Electrical Technology students with the approval of the Department.
Class/Lab. as required, Credit 4

UPPER-DIVISION MECHANICAL ENGINEERING TECHNOLOGY

ITEM-401 Mechanical Design Concepts I

The basic concepts of strength of materials are reviewed in depth as applied to Mechanical Design. The course includes the study of the concepts of stress and strain, the stress-strain relationship, the design and analysis of thin-walled pressure vessels, shafts, and beams, including combined stress.

Class 3, Lab. 2, Credit 4

ITEM-402 Mechanical Design Concepts II

The principles of kinematics and the basic laws of motion applied to the design and analysis of mechanical components and systems.

Class 4, Credit 4

ITEM-403 Mechanical Design Concepts III

Work and energy, impulse and momentum, impact, and fundamentals of vibration applied to mechanical design and analysis.

Class 4, Credit 4

ITEM-411, 412 Engineering Materials I, II

A study of the physical and mechanical properties of metals and alloys. The effect of fabrication on metals, properties of organic and inorganic materials.

Class 3, Lab. 2, Credit 4

ITEM-425 **Statistical Quality Control**

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 4, Credit 4

ITEM-427 Reliability

Covers management responsibilities and organizational structures. Considers the intent and use of statistical techniques and the practical problems involved in relating reliability, operational readiness, and performance capability. (AETM-425)

Class 4, Credit 4

256 COURSE DESCRIPTIONS / MECHANICAL ENGINEERING TECHNOLOGY

ITEM-431 Production Management
 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-432 Production Control
 Fundamental principles in the control of industrial production in relation to forecasting, inventory, production planning, routing, and scheduling.
 Class 4, Credit 4

ITEM-433 Cost Analysis
 Use of decision theory and the nature of man-machine systems in analyzing manufacturing 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.
 Class 4, Credit 4

ITEM-434 Industrial Organization and Management
 The industrial structure is studied to see how the various areas and functions are related to each other. The material covered should give the student an overview of the operations of the organization and an understanding of the fundamental principles of management which lead toward effective coordination and control.
 Class 4, Credit 4

ITEM-436 Engineering Economics
 This course covers some of the factors involved in 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-440 Applied Thermodynamics
 Introduction to the first, second, and third laws of thermodynamics and principles of their application. Properties of a pure substance and the ideal gas.
 Class 3, Lab. 2, Credit 4

ITEM-442 Heat Transfer
 Fundamentals of heat conduction, radiation, and convection; and application to problem solution.
 Class 3, Lab. 2, Credit 4

ITEM-450 Applied Vibrations
 An introduction to the application of the shock and vibration theory to design problems. Special emphasis given to the formulation of practical problems in simple mathematical terms.
 Class 3, Lab. 2, Credit 4

ITEM-460 Applied Fluid Mechanics
 A study of the fundamentals of physics governing the statics and dynamics of fluids. Pipe flow, turbomachinery and the application of fundamentals to the design of fluid systems.
 Class 3, Lab. 2, Credit 4

ITEM-462 Fluid Power Systems
 Principles and applications of fluid power systems necessary to actuate and/or control process equipment; electro-hydraulic-pneumatic systems are studied. Principles of fluidics are introduced.
 Class 3, Lab. 2, Credit 4

ITEM-470 Numerical Control Applications
 The philosophy of the use of numerical control in manufacturing. It will briefly review programming and examine different applications of numerical control. Emphasis will be on identifying the factors involved in justification and determining when numerical control should be used.
 Class 3, Lab. 2, Credit 4

ITEM-472 Tool Engineering
 Selection of tools for production; specification of tools, jigs, fixtures, dies, production type gages; selection of tooling for automatic machines; determining assembly tooling.
 Class 3, Lab. 2, Credit 4

ITEM-480 Methods Analysis
 Principles and applications of basic methods and techniques for improvement of the man-job-time relationship; job standards and recording; work-space design for efficient use of manpower.
 Class 3, Lab. 2, Credit 4

Course Descriptions

R.O.T.C. PROGRAM

Military Science, First Year

MMSM-011 The Military and American Society I

Organization of the Army and ROTC. Warfare: its nature, origins, conduct and future. Leadership laboratory.

MMSM-012 The Military and American Society II

U.S. Army and national security. The military and American society. General military subjects. Leadership laboratory.

MMSM-013 Rifle Marksmanship

Introduction to Infantry weapons. Marksmanship training, sight adjustment and positions. Practice firing and record firing for Army qualification with small bore rifle.

Military Science, Second Year

MMSM-021 Military History I

Survey course in Military History. Scrutinizes technological and tactical innovations and their effect on the conduct of war. Covers the period to 1866.

MMSM-022 Military History II

American Military History from 1866. The involvement of the U.S. in the international conflicts of the 20th century. Emphasis is placed on the U.S. and its involvement overseas.

MMSM-023 Introduction to Basic Operation and Tactics

Provides a knowledge of the fundamentals and techniques of tactics at squad level. Leadership, command and control in the tactical employment of small units is stressed.

Military Science, Third Year

MMSM-031 Fundamentals of Instruction

Examination of principles and techniques that are utilized in the preparation and presentation of a complete period of instruction.

MMSM-032 Leadership in Small-Unit Operations

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.

MMSM-033 Leadership and Management

Provides future officers with the basic principles of leadership and management of human resources. Motivation, morale, communication, individual and group behavior are discussed.

Military Science, Fourth Year

MMSM-041 Theory and dynamics of the Military Team

Provides a broad understanding of the principles, fundamentals and tactics as they apply to employment of combat teams. Emphasis is on leadership responsibilities and the roles and contributions of various branches of the Army in support of the combat team.

MMSM-042 Military Justice/Administration and Staff Operations

In-depth study of the Uniform Code of Military Justice from its inception to the present. Particular emphasis is placed on the comparison and relationship of the civilian and military systems. Staff functions at battalion level and company administration.

MMSM-043 World Change and Military Implications

Provides an understanding of the component parts of the international system. The spectrum of force and use of force in the contemporary world. The major world events having military implication for the U.S.



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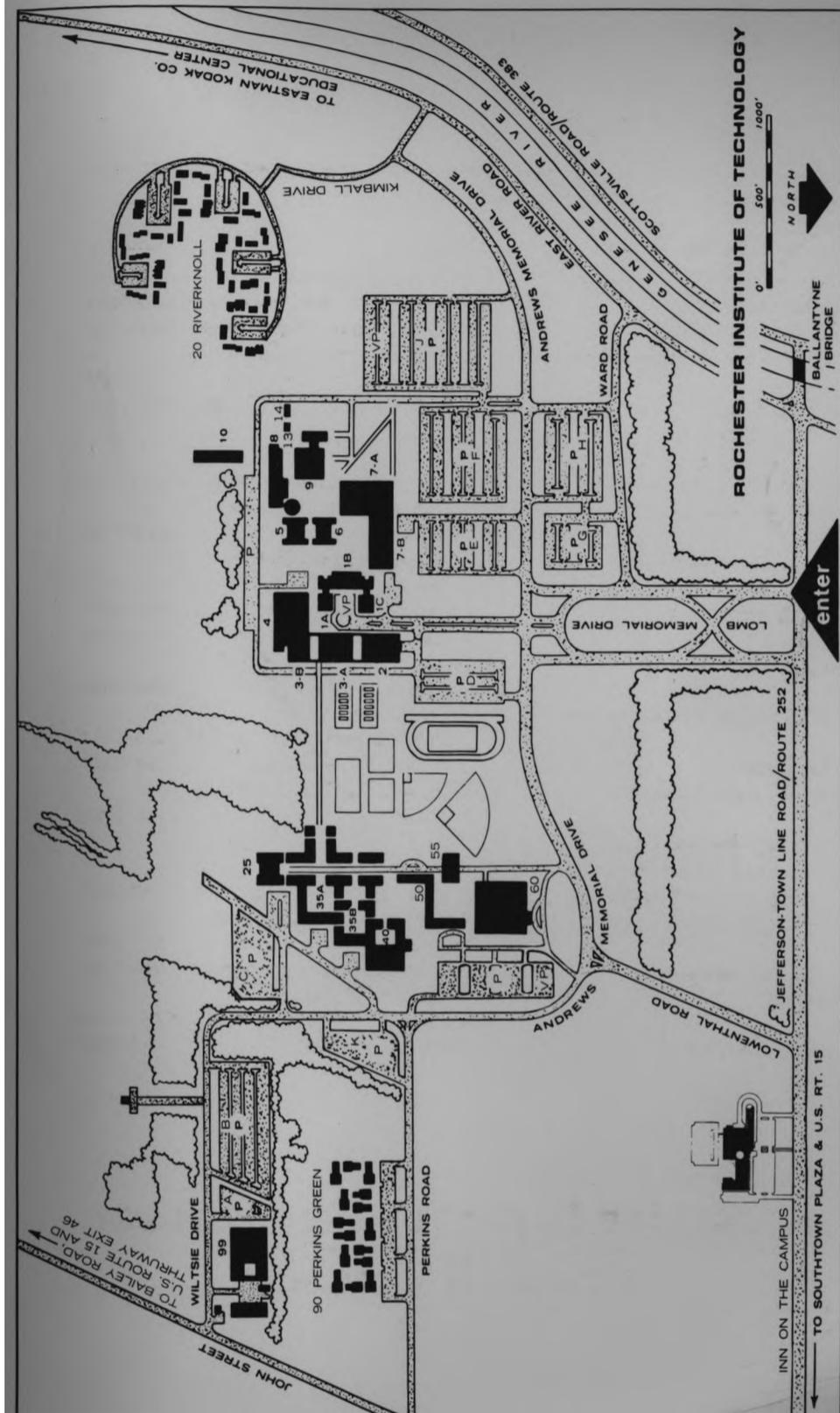
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