Youngstown State University Bulletin 1978-1979

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Accreditation

Youngstown State University is accredited by the North Central Association of Colleges and Secondary Schools, by the Department of Education of the State of Ohio as a teacher education institution, and by the National Council for Accreditation of Teacher Education. It is on the approved list of the American Medical Association, the American Dental Association, and the American Chemical Society. The Dental Hygiene Technology program has conditional approval status from the Accreditation of Dentists and Dental Auxiliaries Education programs. The William Rayen School of Engineering is accredited by the Engineers' Council for Professional Development for its day and evening curriculums in chemical, civil, electrical, and mechanical engineering and materials science; and by the American Institute of Chemical Engineers. The electrical, civil and mechanical engineering technology associate programs are accredited by the Engineers' Council for Professional Development. The associate degree nursing program is accredited by the National League of Nursing and is approved by the Ohio State Board of Nursing Education and Nurse Registration. The Dana School of Music of Youngstown State University is a member of the National Association of Schools of Music.

MEMBERSHIPS

The University is a member of the American Council on Education, the American Association of Colleges for Teacher Education, the Association of American Colleges, and the Association of Urban Universities. It is a corporate member of the American Association of University Women.

DEGREES GRANTED

Youngstown State University grants the degrees of Master of Arts (M.A.), Master of Science (M.S.), Master of Science in Education (M.S. in Ed.), Master of Science in Engineering (M.S. in E.), Master of Business Administration (M.B.A.), Master of Music (M.M.), Bachelor of Arts (A.B.), Bachelor of Engineering (B.E.), Bachelor of Fine Arts (B.F.A.), Bachelor of Music (Mus. B.), Bachelor of Science (B.S.), Bachelor of Science in Applied Science (B.S. in A.S.), Bachelor of Science in Business Administration (B.S. in B.A.), Bachelor of Science in Education (B.S. in Ed.), Associate in Arts (A.A.), Associate in Applied Business (A.A.B.), and Associate in Applied Science (A.A.S.).

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FALL 1978

Sept. 15	Fri.	1000	Faculty Meeting
Sept. 25	Mon.	0800	Classes begin
Sept. 30	Sat.	1300	Last day to add a class
Oct. 2	Mon.	1700	Last day to apply for fall quarter graduation
Nov. 4	Sat.	1100	Last day to withdraw with a W
Nov. 10	Fri.		Legal holiday—University closed
Nov. 22	Wed.	2300	Thanksgiving academic break begins
Nov. 27	Mon.	0800	Thanksgiving academic break ends
Dec. 7	Thurs.	0800	Final examinations begin
Dec. 13	Wed.	2300	Final examinations end
Dec. 22	Fri.		Legal holiday—University closed
Dec. 25	Mon.		Christmas holiday—University closed
Jan. 1	Mon.		New Years Day—University closed

WINTER 1979*

Jan. 2	Tues	0800	Classes begin
Jan. 8	Mon.	2000	Last day to add a class
Jan. 15	Mon.		Legal holiday—University closed
Jan. 16	Tues.	1700	Last day to apply for winter quarter graduation
Feb. 12	Mon.	2000	Last day to withdraw with a W
Mar. 12	Mon.	0800	Final examinations begin
Mar. 17	Sat.	1430	Final examinations end
Mar. 24	Sat.	1000	Winter Commencement

*The calendar may be extended into the week of March 18-24 if necessitated by emergency closings of the University.

SPRING 1979

Mar. 26	Mon.	0800	Classes begin
Mar. 31	Sat.	1100	Last day to add a class
Apr. 2	Mon.	1700	Last day to apply for spring quarter graduation
May 5	Sat.	1100	Last day to withdraw with a W
May 28	Mon.		Legal holiday—University closed
June 4	Mon.	0800	Final examinations begin
June 9	Sat.	1430	Final examinations end
June 16	Sat.	1000	Spring Commencement

SUMMER 1979

June 18	Mon.	0800	Classes begin—entire summer quarter and first term
June 22	Fri.	1700	Last day to add a class—first term
June 23	Sat.	1100	Last day to add a class entire summer quarter
June 25	Mon.	1700	Last day to apply for summer quarter graduation
July 4	Wed.		Legal holiday—University closed
July 7	Sat.	1100	Last day to withdraw with a W—first term classes
July 20	Fri.	2200	First term ends (Final examinations for first term classes are given during last scheduled class period)
July 23	Mon.	0800	Second term begins
July 27	Fri.	1700	Last day to add a class—second term
July 28	Sat.	1100	Last day to withdraw with a W—entire summer quarter
Aug. 11	Sat.	1100	Last day to withdraw with a W—second term classes
Aug. 24	Fri.	2200	Second term and entire summer quarter end (Final examinations are given during last scheduled class period)
Aug. 25	Sat.	1000	Summer Commencement

Times provided above are based on the 24-hour system, in which the day begins at midnight and hours are numbered consecutively through 2400. Thus, 8:00 a.m. is 0800, and 8:00 p.m. is 2000.

All registration is by appointment only and is concluded prior to the beginning of classes for each quarter.

OBJECTIVES

Youngstown State University is an urban University, established and assisted by the State of Ohio, and maintained in order to provide a wide range of opportunities in higher education to satisfy the needs particularly—but not exclusively of the residents of Mahoning, Trumbull, and Columbiana counties of Ohio, and Mercer and Lawrence counties in Pennsylvania. Broad access to the University is emphasized through a policy and philosophy of "open admissions;" extensive financial support for students, both directly and indirectly; and the close proximity of the University to the constituency it serves. The University offers its students diverse educational experiences, ranging from the one-day non-credit workshop to professional training at the graduate level. Instruction is the primary function of the University, although the institution is also committed to research, scholarship, and public service. A major goal and defining characteristic of the University is, has been, and will be its serving primarily the postsecondary educational needs of its service region. As a basically nonresidential campus, the University has emphasized the students who have wished to pursue their education while remaining at home, often combining a program of higher education with employment off-campus. While the University has welcomed students from other parts of the nation and from around the world, the institution has sought to become, and is committed to be, preeminent as a leader within its service region.

AFFIRMATIVE ACTION OFFICE STATEMENT OF POLICY

Youngstown State University shall operate within an effective affirmative action program to promote equal employment opportunities and also to ensure non-discrimination in all of its educational programs and services.

Youngstown State University shall operate in compliance with the *Civil Rights* Act of 1964, as amended by Executive Order 11246, and also with *Title IX Regulations* implementing the *Education Amendment* of 1972.

Explicitly, it is the policy of Youngstown State University to reaffirm its commitment towards non-discrimination on the basis of sex, race, religion, color, age, national origin, or handicap, to: 1) applicants for admission to the University, and 2) matriculating students in its execution of the operational educational programs; also, 3) employees of the University; 4) applicants for employment to the University; and 5) organizations extending contractual services to the University.

RESPONSIBILITY AND IMPLEMENTATION

The University shall maintain an active Affirmative Action Office and Committee, under the direction of the Affirmative Action Officer. This Office shall periodically review the Affirmative Action program; to discuss grievances and charges of discrimination; and to extend recommendations for achieving an effective affirmative action program. The ultimate responsibility for maintaining a viable and effective Affirmative Action program rests with the President of the University.

The University shall make available a written affirmation of its Affirmative Action program to all people associated with the University—every student, staff member, faculty member, and employee. Further, the University shall make written and public announcements of its equal opportunity employment policy and its Affirmative Action program (communicated by television and radio messages, publications in appropriate journals and magazines, announcements in replies to correspondence, and by posting of the Affirmative Action program at conspicuous locations on campus).

HISTORICAL SKETCH

Youngstown State University had its beginning in 1908 with the establishment of the School of Law of the Youngstown Association School, sponsored by the Young Men's Christian Association. In 1920 the State of Ohio empowered the School to grant the degree of Bachelor of Laws; in the same year the School offered a four-year course in business administration. In 1921 the School changed its name to The Youngstown Institute of Technology, and liberal arts classes were offered, in the evening, for the first time. In 1927 the College of Arts and Sciences, offering daytime classes for the first time, was established. In 1928 the Institute changed its name to Youngstown College and in 1930 the College conferred the degree of Bachelor of Arts for the first time.

Dana's Musical Institute, founded in nearby Warren in 1869, became the Dana School of Music of the College in 1941. In 1946, the engineering department, organized several years before, became the William Rayen School of Engineering; two years later the

business administration department became the School of Business Administration; and in 1960, the department of education became the School of Education.

In 1944 the trustees of the Young Men's Christian Association transferred control of the institution to the members of the Corporation of Youngstown College, and in 1955 the corporation was re-chartered as The Youngstown University. The University joined the Ohio system of higher education in September, 1967 as Youngstown State University.

The Graduate School and the College of Applied Science and Technology were established during the spring of 1968. In 1972, the University became a member of a consortium formed by the University of Akron, Kent State and Youngstown State universities which sponsors the Northeastern Ohio Universities College of Medicine. The College of Fine and Performing Arts was established in 1974.

THE GENERAL PROGRAM OF THE UNIVERSITY

Youngstown State University is a co-educational, non-sectarian, and non-profit organization: it is open to anyone of good character with the proper academic qualifications. Efforts are made to give all necessary guidance and assistance to war veterans with military service.

The University has eight main units that offer courses of study leading to degrees:

- The College of Applied Science and Technology
- The College of Arts and Sciences
- The School of Business Administration
- The School of Education
- The William Rayen School of Engineering
- The College of Fine and Performing Arts
- The Graduate School
- The Northeastern Ohio Universities College of Medicine

Courses in most subjects are offered in both day and evening classes, with no difference in credit toward degrees, and at all hours from 8 a.m. to 10 p.m. Monday through Friday and from 8 a.m. to 1:40 p.m. on Saturday. The main academic year is from late September into June, in three 10-week quarters. During the summer quarter, courses are offered both for the full 11 weeks and for half-sessions of five weeks each.

THE COLLEGE OF APPLIED SCIENCE AND TECHNOLOGY

The College of Applied Science and Technology offers baccalaureate programs in civil engineering technology, computer technology, corrections, electrical engineering technology, food and nutrition, home economics, law enforcement administration, mechanical engineering technology, medical technology, and nursing; a program leading to the Associate in Arts degree with concentrations in business administration, business and secretarial, engineering and mathematical sciences, humanities, science or mathematics, and social studies; programs leading to the Associate in Applied Business degree in accounting technology, advertising technology, business management technology, court/conference reporting, graphics technology, marketing technology, public administration technology, real estate technology, secretarial studies, and transportation management technology; and programs leading to the Associate in Applied Science degree in child care technology, civil engineering technology, computer technology, dental hygiene technology, dietary technology, drafting and design technology, electrical engineering technology, emergency medical technology, mechanical engineering technology, medical assisting, medical laboratory technology, nursing, police science technology, respiratory therapy technology, and social service technology. In cooperation with the School of Education it prepares secondary school teachers in business education and home economics.

THE COLLEGE OF ARTS AND SCIENCES

The College of Arts and Sciences aims to provide a liberal education and to prepare students for graduate and professional study. In cooperation with the School of Education it prepares teachers for secondary schools, and some of its other curriculums qualify the student to enter several technical or professional fields upon graduation. It provides the arts and sciences courses in the curriculums of the other schools and colleges that comprise the University.

Programs offered by the College of Arts and Sciences lead to either a Bachelor of Arts or Bachelor of Science degree. A student working toward a Bachelor of Science in Education degree takes most of the courses in Arts and Sciences subjects. The major subject may be American studies, anthropol-

ogy, biology, black studies, chemistry, classical studies, computer science, earth science, economics, English, French, geography, geology, German, health, history, Italian, Latin, mathematics, medical technology, music, philosophy, physical education, physics, political science, psychology, Russian, religious studies, sociology, social work, or Spanish, or a combined major in the sciences, social studies or the humanities. Courses are also offered in astronomy, the Bible, composition, ancient Greek, journalism, linguistics and military science.

THE SCHOOL OF BUSINESS ADMINISTRATION

The School of Business Administration offers courses leading to the degree of Bachelor of Science in Business Administration, with a major in accounting, advertising and public relations, advertising art, finance, general administration, industrial management, management, fashion or industrial or retail marketing, marketing management, public administration, transportation management, and secretarial studies.

THE SCHOOL OF EDUCATION

The School of Education offers courses leading to the Bachelor of Science in Education degree. It also cooperates with the College of Arts and Sciences in providing the professional courses for the degrees of Bachelor of Arts and Bachelor of Science with the major in the teaching field, with the School of Business Administration in the preparation of teachers of commercial subjects, with the Dana School of Music for the Bachelor of Music degree with the major in public school music, and with the College of Applied Science and Technology in the preparation of business education and home economics teachers. The departments of the school are Foundations of Education; Elementary Education; Guidance, Counseling, and Pupil Personnel; Secondary Education; and Special Education.

THE WILLIAM RAYEN SCHOOL OF ENGINEERING

The William Rayen School of Engineering offers complete curriculums in chemical, civil, electrical, industrial, materials science, and mechanical engineering. All lead to the degree of Bachelor of Engineering.

THE COLLEGE OF FINE AND PERFORMING ARTS

The College of Fine and Performing Arts offers programs leading to the degrees Bachelor of Arts, Bachelor of Music, Bachelor of Fine Arts, and Bachelor of Science in Education (in conjunction with the School of Education). The major academic units of the College are the Department of Art, the Department of Speech Communication and Theatre, and the Dana School of Music.

THE GRADUATE SCHOOL

The Graduate School offers programs in economics, English, and history leading to the Master of Arts degree; programs in biological sciences, chemistry, criminal justice, and mathematics leading to the Master of Science degree; programs in accounting and finance, management, and marketing leading to the Master of Business Administration degree; programs in music education, performance, music theory and composition, and music history and literature leading to the Master of Music degree; programs in civil, electrical, mechanical engineering and materials science leading to the Master of Science in Engineering degree; and master teacher (elementary and secondary), educational administration and supervision (elementary and secondary), school guidance and counseling, and special education programs leading to the Master of Science in Education degree.

THE NORTHEASTERN OHIO UNIVERSITIES COLLEGE OF MEDICINE

The University is a member of a consortium formed by the University of Akron, Kent State and Youngstown State universities which sponsors the Northeastern Ohio Universities College of Medicine.

The first class of students was admitted to this non-traditional medical program in the spring of 1975. Students will be identified as candidates for the combined B.S./M.D. degree program during their first two years of University work. Clinically related experiences will be made a part of the students' education so that they begin to appreciate the relevance of science courses to their future role. After the second year (eight quarters) of college-level work, these medical students will be eligible for admission to the second phase of their medical education which will correspond to that taken in medical schools. Their program will also require them to take some courses in the humanities and sciences divisions of the universities. Medically related science instruction will be given under the direction of the medical school faculty. The

emphasis on the basic science experiences will continue throughout the last four years of undergraduate medical school and will be shared with graduate physicians in internship and residency training. A detailed description of the curriculum is available from the offices of the Dean of the College of Arts and Sciences and the Director of Admissions.

Prospective students who seek admission to Youngstown State University's combined B.S./M.D. degree program are required to submit an application to the Youngstown State University Special Joint Admissions Committee. Applicants are required to take the Scholastic Aptitude Test and it is recommended that the examination be taken no later than November. Applications are accepted between September and December 31.

SPECIAL PROGRAMS
BLACK STUDIES

The Black Studies Program was established at Youngstown State University in the fall of 1970 and a major program of study was approved by the University Senate in the winter of 1972. The purpose of this interdisciplinary major is to facilitate the academic investigation and analysis of the historical, social, and aesthetic impact of the people of African descent on American society and the world. It also provides for the systematic study of the problems confronting the modern multi-racial world. The Black Studies major can serve as valuable pre-professional training in various fields of employment including teacher education, business, law, social work, and humanities. A Black Studies minor complements majors in related areas, especially in economics, education, English, history, philosophy, political science, religious studies and sociology. Both the major and minor programs can provide diverse opportunities for employment, and graduate and postgraduate experiences.

CONTINUING EDUCATION AND PUBLIC SERVICE

Organization and Programs. Continuing Education and Public Service embraces two areas: Continuing Education and the Center for Urban Studies. It aids in interfacing the research, service, and continuing education resources of the University with the needs of the area through consultation, and on-and off-campus course offerings. The non-degree programs for adults serve industry, business, labor, public officials, professionals in all fields, and the general public in updating skills or in stimulating new interests.

The offices of Continuing Education and Public Service are located on the ground floor of Cushwa Hall.

DEPARTMENT OF CONTINUING EDUCATION

The department is charged with the development and administration of courses and programs outside the traditional degree programs of the University. Through its programs area residents are able to engage in a wide variety of adult education or life-long learning opportunities.

The COMMUNIVERSITY SERIES of non-credit courses enables individuals to learn in informal settings without the pressures of examination and papers and enables adults to discuss and probe subjects of their choice under the guidance of University faculty or community leaders. Courses in this series are directed toward the basic informational, educational, recreational and leisure needs of mature adults and are offered at a variety of times to meet the lifestyle and changing educational needs and interests of adults.

The PROFESSIONAL AND OCCUPATIONAL SERIES offers courses to aid individuals in updating professional knowledge and skills or exploring new areas of knowledge and skill development. Continuing professional education is becoming increasingly important. The department is developing new and innovative programs to meet the needs of professionals who want to prepare themselves to serve better wherever they are and whatever they are doing. In addition to the on-campus courses offered, the department also provides in-plant educational programs.

The department also serves the personal and professional needs of the community through the sponsoring of WORKSHOPS AND CONFERENCES designed to address topics of interest which bring the resources of the University to bear on the needs of professionals and community leaders.

Through the EDU-TRAVEL SERIES the department provides opportunities for armchair travel through travelogue programs, or through informal learning programs, which couple opportunities to visit other settings of interest and engage in study prior to the visit and while at the location. Travel opportunities to places near and far are planned to add to

the cultural and educational understanding of area residents.

The ADULT OUTREACH program is designed to enable high school graduates or individuals holding the GED, who never attended a college or university previously, to enter the University for undergraduate study, and is administered by the Department of Continuing Education. During the first six courses, the individual is advised by the staff in the Department of Continuing Education.

Continuing Education Programs designed to meet the special needs of women and the aging are administered by the department through the ALTERNATIVES SERIES, courses and workshops developed to assist women in meeting their changing lifestyles and expanding role in today's society, and the COLLEGE FOR OVER SIXTY. The College for the Over Sixty provides under legislative authorization the opportunity for Ohio residents who are 60 years of age or older to enroll in credit classes on a non-credit basis, as space is available. These educational programs provide women and senior citizens with the opportunity to interact with others, exploring common interests and concerns.

The DANA PREPARATORY PROGRAM offered in association with the Dana School of Music offers musical training in nearly all areas to pre-school and school-age students and adults not enrolled for credit in the University. Admission to the Dana Preparatory Program does not presuppose any previous musical training. Individual lessons are scheduled at the convenience of the teacher and pupil.

For additional information on these and other continuing education programs contact the Department of Continuing Education.

DEPARTMENT OF BROADCASTING

*RADIO PROGRAMS.*The University owns and operates a 22,500-watt stereo FM radio station with a range of approximately 55 miles. The station operates at 88.5 megahertz and broadcasts 19 hours a day, providing more than 4,000,000 people in Northeastern Ohio and Western Pennsylvania with fine arts programming. WYSU studios are housed in Cushwa Hall. The primary purpose of the station is to serve the cultural and educational needs of the area by providing an alternative listening service, emphasizing serious music and intellectually stimulating public affairs programming not otherwise provided by commercial stations in the area.

FM-SCA PROGRAMS. The University transmits special educational programs for the handicapped on a multiplex basis using a sub-carrier frequency of 67 kilohertz.

TV PROGRAMS. The University is a member of NETO (Northeastern Educational Television of Ohio), a Public Television consortium of Akron, Kent, and Youngstown universities which operates UHF Channels 45 and 49. The transmitters for the stations are located at Salem and Akron.

While the common transmitters broadcast non-local programs acquired from national public television sources and the Ohio Educational Television Network, all local programs are produced at production centers at Akron, Kent, and Youngstown. The University's TV Center is located in Cushwa Hall.

The broadcast service attempts to bring to all audiences the University's and Community's best energies, the best resources, and the best talents in helping people perceive substance-not escape-substance, which attempts to educate and elevate in everything.

The core of the radio and television operations is a full-time professional staff, but the department does employ students who have the qualifications and competence to meet professional broadcasting standards.

CENTER FOR URBAN STUDIES

The Center for Urban Studies is a research and community service institute. The Center was established by the University Board of Trustees in recognition of the obligations of the University for the continuous development and progress of the region. The primary objective of the Center, therefore, is to relate the resources of the University to the problems and processes associated with urbanization in our region, through the development of an ongoing program of urban applied research, technical assistance and training to local government, business, and public service organizations.

SERVICE AREAS. The following are representative of services available to the community through the Center for Urban Studies. 1) Systematic assessments of the impact of public programs and designs for improved delivery of service. 2) Management analyses and organizational development strategies that emerge from examination of current practices drawing on innovations in

public administration and aiming at improving productivity. 3) Low-cost, rapid sampling of public opinion by telephone, questionnaire, or personal interviews. 4) Aid in survey design and analysis; assistance in design of computer-based systems for data management to aid in planning and operations. 5) Data storage and processing facilities available to public users at reasonable cost. 6) Aid to decision-makers in selecting the best alternative program or policy, based on formal assessments of needs, projected environmental and economic impacts, and benefits-cost or cost-effectiveness analysis. 7) Access to census tapes, technical reports and other publications related to urban public management. 8) Training processes, workshops, seminars, and symposia of various lengths and formats to bring information on urban problems to the attention of public administrators, citizens, and faculty.

DEVELOPMENTAL EDUCATION

The Office of Developmental Education assists students in the transition from high school to college by providing the following services: Credit courses are provided during the year through the departments of English, Mathematics and Reading and Study Skills which will help a student strengthen deficiencies in these basic skills. A special six-week program is offered in the summer to orient the new student to campus life and to begin building the academic skills necessary for success. Tutoring in 500 and 600 level courses, non-academic peer counseling, and special assistance for physically handicapped students (primarily reader assistance to blind students) complete the program of on-going support services.

Students eligible for participation in the Developmental Education program include: those with an ACT composite score of 20 or lower; veterans; physically handicapped students; Latino and racial minorities; older students returning to further their education after an absence of several years; and students who are otherwise academically deficient or culturally disadvantaged. Program services are normally provided for these students for the first six quarters of matriculation or completion of 72 hours of credit, whichever is accomplished first.

Services of the Office of Developmental Education are provided free of charge to all registered Youngstown State University students. Office hours are 8:00 a.m. to 5:00 p.m. weekdays, plus some evening hours which will vary from quarter to quarter. Contact the office for specific information.

CAMPUS DEVELOPMENT

During its earlier years the institution had a number of homes. Starting in the old Central YMCA building, it occupied various sites on Wick Avenue until the completion of Jones Hall in 1931. Additional buildings have been constructed and nearby properties converted to University use, so that today the campus extends through much of an area four blocks long and three blocks wide, covering 80 acres. The University also has 17.6 acres in Liberty Township, and 118.4 acres in Hartford Township.

A program has been developed to increase the main campus on the north and on the east, which will ultimately result in a main campus of approximately 150 acres.

JONES HALL

The oldest building in the central campus is Howard W. Jones Hall, a limestone structure of conventional Tudor style on the northwest corner of Wick and Lincoln Avenues. Built in 1931, it was enlarged in 1949 by the addition of the C. J. Strouss Memorial Auditorium, in honor of C. J. Strouss, late president of the Strouss-Hirshberg Co. and long a devoted friend and trustee of Youngstown State University.

In 1978 the interior of this building was completely remodeled to accommodate the administrative offices directly serving student needs: Dean of Admissions and Records; Admissions; Registrar; Records; Business Operations; Financial Aids; Career Planning and Placement; Counseling Center; Dean of the Graduate School.

LIBRARY-TOD HALL

The University's main administrative offices, not directly related to student activities, are housed in the newly remodeled Library-Tod facility. These offices include: President; Vice Presidents; Dean of Administrative Affairs; Dean of Student Affairs; University Relations Office; Budget Office; Campus Development; Payroll; Personnel; Purchasing; Audits and Systems; Security; Computer Center; Affirmative Action; Auxiliary Services; and the Board of Trustees' Meeting Room.

THE WILLIAM F. MAAG, JR. LIBRARY

The University's six-story William F. Maag, Jr. Library is an attractive and comfortable

environment for study and research. A member of the Ohio College Library Center automated system, Maag Library provides reference, government document, interlibrary loan and other services necessary to the needs of the University community.

The library includes instructional and research materials in books, periodicals, and microforms. These holdings number 361,000 bound volumes and 385,000 microforms. Periodicals, microforms, and micro readers are housed on the first floor. Coin-operated copy machines are available in this area for student use. The second floor is the main floor, where user services and library offices are located. The book collection is distributed throughout the second through sixth floors in open stacks, with split level design between stack and reading levels. Study carrels and study rooms are located on each floor.

Maag Library and its facilities provide the opportunity for individual development as well as group study and discussion.

THE WARD BEECHER SCIENCE HALL

This building houses the science departments and laboratories of the College of Arts and Sciences. The four-story building was constructed in 1958 with an addition completed in 1967. It was built at a cost of over $3 million, with funds contributed by Mahoning Valley industries and area industrialist Ward Beecher, for whom the building was named. The building contains many lecture rooms, special laboratories, including two atomic research laboratories and a reactor room equipped by the Atomic Energy Commission. Included in the new addition is a well-equipped and modern planetarium.

POLLOCK HOUSE

Pollock House, across from Bliss Hall, College of Fine and Performing Arts, provides a pleasant and convenient setting for teas and other social gatherings. It was given to the University in 1950 by its former owners, Mr. & Mrs. William B. Pollock, II. Its two upper floors are used for classrooms and the offices of the Military Science Department, but the spacious parlors, dining rooms, and kitchen are available to campus groups for specific events. It also houses the offices of the Youngstown Educational Foundation and the University Credit Union.

CLINGAN-WADDELL HALL

The acquisition, renovation, equipping, and maintenance of this building, formerly the Y.M.C.A. Youth Center, was made possible in 1953 through the generosity of Mrs. Jacob D. Waddell and John R. T. Clingan of Niles, Ohio. Situated on Rayen Avenue just east of Wick Avenue, it houses the ceramics area of the Department of Art.

RAYEN HALL

Rayen Hall on Wick and Rayen avenues, is the former home of Rayen School, the first secondary school in Youngstown, founded and long maintained with private funds but eventually incorporated into the city's school system. After Rayen School moved to larger quarters, the building was made available to Youngstown State University. It is now utilized for general University classrooms, and facilities for the student publications on campus: the *Jambar, Neon* and *Penguin Review.*

SCHOOL OF EDUCATION BUILDING

The School of Education building, formerly Elm Street School, is a modern brick building with classrooms and offices for administrative personnel. Built in 1951, it was purchased from the Youngstown Board of Education in September 1965 and extensively remodeled in 1975.

KILCAWLEY CENTER

The first building constructed as part of the University's Campus Development Plan was Kilcawley Center. The Center includes dining rooms, lounges, and meeting rooms. A gift of $300,000 had been made to the Center by the William H. and Mattie M. Kilcawley Foundation, to which gifts from industry and from alumni and student funds were added.

An addition to the Center was opened in 1974. It provides facilities for a central information and message center; recreation and games; social activities and parties; conferences and committee meetings; exhibition of painting, sculpture and other art forms; student government and activities offices; food service; and reading, TV, and general lounging, and Student Affairs Offices.

ENGINEERING SCIENCE BUILDING

The Engineering Science Building is located directly west of Ward Beecher Science Hall. An L-shaped structure, it houses the William Rayen School of Engineering.

COLLEGE OF ARTS AND SCIENCES BUILDING

The College of Arts and Sciences Building

was occupied early in 1978. The departments of Economics, English, Foreign Languages and Literatures, History, Philosophy and Religious Studies, Political Science and Social Science, Psychology and Sociology, Anthropology and Social Work, as well as the offices of the dean are housed in the six-story structure. There are faculty and supporting staff offices, five student lounge/study areas, a number of classrooms and laboratories, a computer terminal room and a 210-seat lecture hall with stage.

LINCOLN PROJECT

Lincoln Project, on the southeast corner of Lincoln and Phelps avenues, houses the School of Business Administration.

BLISS HALL

Housing the Department of Art, the Dana School of Music, the Department of Speech Communication & Theatre and the office of the Dean of Fine & Performing Arts, Bliss Hall was named in memory of William E. Bliss, a prominent area industrialist. Facilities include a 409-seat theatre, Ford Auditorium named for the Ford family; 207-seat Choral Recital Hall; an experimental theatre with flexible seating up to 150; 70 music practice rooms — equipped with studio or grand pianos; a Schlicker performance organ and two Flentrop practice organs; approximately 27 faculty office/studios in music which can be used for instruction; a band/orchestra room with a library; a photography studio with 17 enlargers; a crafts studio with 18 weaving looms; fully equipped drawing, advertising, printmaking, sculpture, and painting studios; a complete shop with heavy equipment for working in three dimensional design; faculty office/studios; a Materials Center with a collection of 5000 LP's, 2000 historic performances on 78's, 2000 volumes of musical scores, and 43,000 art slides; and conference and seminar rooms adjacent to the Dean's office.

BEEGHLY PHYSICAL EDUCATION CENTER

This building, completed in 1972, contains the Department of Health and Physical Education and the Athletic Department. Its facilities include a gymnasium with spectator seating for nearly 6,000, and an Olympic-size swimming pool. There are 17 classrooms including laboratories for health research and kinesiology; separate gymnasiums for wrestling, weight lifting, gymnastics, and physical education for the handicapped; handball and squash courts; and a rifle range. This building is located on Spring Street between Fifth Avenue and Elm Street.

ALL-SPORTS COMPLEX

An 18-acre site adjacent to Beeghly Center has been set aside for the construction of an All-Sports Health and Physical Education Complex that will include a 13,000-16,000 seat stadium, and multi-purpose sports fields for football, field hockey and soccer. Softball diamonds, hard surface tennis courts, and an all-weather track are also planned. The Arnold D. Stambaugh Stadium will house the athletic department with coaches offices, officials dressing rooms, classrooms, gymnasiums and other physical education facilities.

CUSHWA HALL

Opened in 1976, this structure houses the departments and the dean of the College of Applied Science and Technology as well as the Media Center, Television Center, Radio Station, Urban Studies, Continuing Education Department, Geography Department and Mathematics Department. One of the largest buildings on campus, it contains 52 classrooms, 70 laboratories, 169 offices, and 23 conference-seminar rooms.

THE ALUMNI OFFICE

An up-to-date record of the more than 28,000 graduates is maintained by the Alumni Office. As far as possible, the graduate's record shows place of employment, the type of work being done and advanced degrees earned, as well as other information. The Alumni Office is located in the North Annex.

The Youngstown State University Alumni Association is the official organization of the institution's alumni. Membership is extended to all graduates and former students of the University.

LABORATORIES

Biology, chemistry, geology, and physics laboratories are in the Ward Beecher Science Hall; the language laboratory is in the College of Arts and Sciences Building. The engineering laboratories are described in the School of Engineering section.

The Foreign Language Laboratory is a dual-purpose facility designed for both classroom use and individual study. The classroom section with 31 student stations provides for scheduled group programs with each carrel equipped with individual cassette

recorders coordinated with a multi-channel console through which audio programs are transmitted to the students. An additional feature of this class lab is a 16 mm. film projector with auxiliary feed into the console to provide indivldual listening of the movie soundtrack. The other lab is designed for individual study with 44 carrels in which all types of audio-visual equipment can be used. Special oversized carrels have also been included to house video equipment. Students employing the lab facilities have at their disposal many audio-visual programs for audio/oral practice and the study of foreign cultures.

The psychology laboratories are new facilities in the basement of the College of Arts and Sciences Building. In the psychology laboratory, students can learn basic techniques of experimental psychology, child psychology, social psychology, and survey research. Some of the equipment includes an electromagnetically isolated room for recording of neural activity, a surgery room for the investigation of brain-behavior interactions, animal housing areas, a child observation room with a one-way mirror, automated programming equipment for the control of animal behavior, and a complete audio-visual system to record the different behaviors possible in the laboratory setting.

The Anthropology Department operates a well-equipped physical anthropology and archaeology laboratory with a wide range of special equipment including research microscopes, analytical balances, spectro-photometers, etc.

PHYSICAL EDUCATION FACILITIES

The Beeghly Physical Education Center provides offices, classrooms, laboratories, activity areas, gymnasium, natatorium, locker and shower facilities for health and physical education activities. The University also uses the municipal facilities of Borts Field on Oakwood and Belle Vista avenues; the well-equipped sports centers in Mill Creek Park; and the McGuffey Bowling Lanes on North Garland Avenue. Varsity teams use the gymnasium, natatorium, gymnastics room, and the rifle range in the Beeghly Physical Education Center; Fitch Stadium; Stambaugh Field, the gift of Arnold Stambaugh, for practice; municipal tennis courts; Mill Creek sports fields, and the Avalon Golf Course. In the planning stages is a complete sports complex.

THE BOOKSTORE

The Youngstown State University Bookstore, located at the west end of the Kilcawley Center complex, sells required texts, materials, and supplies. In addition, because of their value as collateral reading, the Bookstore stocks in limited quantities a wide selection of standard books in inexpensive editions. A selection of personalized soft goods, gifts, and specialty items is also carried.

PARKING AREAS

Parking facilities for students include a parking deck and open lots marked for student use. (Parking facilities for faculty and staff are so marked.)

Between 5:00 p.m. and 7:00 a.m., students, faculty, and staff may park in any University parking lot. (For information concerning registration of vehicles and applicable fees, see the *Fees and Expenses* section of this catalog.)

STUDENT PERSONNEL SERVICES

OFFICE OF THE DEAN OF STUDENT AFFAIRS

The Dean of Student Affairs is the chief administrative officer of the Division of Student Affairs and has the overall responsibility for the supervision, leadership, and professional development of the personnel making up the Division of Student Affairs. The Division is administratively divided into three elements — development, activities, and services — "each of which is the responsibility of an Assistant Dean of Student Affairs. Included in the development element are the offices of Career Planning and Placement, Counseling & Testing Center, Developmental Education, and New Student Orientation. The activities element includes the management, operation, and program of Kilcawley Center, and the office of the Coordinator of Student Activities. The Health Service, International Student Office, and Off-campus Housing currently make up the services element of the Division.

The Dean and three Assistants share certain division-wide and campus-wide responsibilities. These shared responsibilities include: assessment of student needs; advisement of student governmental bodies; coordination of student participation in campus committee systems, and student campus-wide awards; administration of emergency student loan fund; promulgation and enforcement of rules and regulations

governing student conduct; and acting as campus referral agents to students, faculty, staff, alumni, visitors, and friends seeking assistance or information. In addition, the Deans serve on University committees, boards, and councils in an effort to maintain a University-wide prospective and to ensure effective articulation with other segments of the campus community.

COUNSELING AND TESTING

The Counseling Center staff includes several counseling psychologists and a testing director. All are experienced professionals who specialize in working with college students who might be concerned with adapting to college life, academic progress, career choice, drugs, family, marriage or problem pregnancies, and other personal concerns.

No information is released to officers of the administration, to faculty members, to parents, or to outside agencies without the student's explicit authorization, except when there is a clear and immediate threat to the life or welfare of the student or the community at large. Information obtained in the course of counseling remains confidential and in no way reflects upon the student's academic record.

The Counseling Center administers the American College Test, the Graduate Record Examination, the Miller Analogies Test, the Law School Admission Test, Medical College Admission Test, and the Graduate Management Admission Test. Information regarding other national examinations is available.

In conjunction with the faculty, the Counseling Center also supervises the administration of "make-up" examinations.

Counseling services are free to all students of the University. Fees, however, are associated with the testing programs.

INTERNATIONAL STUDENT PROGRAMS

The International Student is a most welcome member of the University community; they enrich it by sharing knowledge, understanding, and appreciation of their culture. The University affords its International Students the same opportunity to participate in University affairs as all other students.

It is expected that an International Student should have attained a certain degree of proficiency in the use of English at the time of arrival on campus enabling them to engage in academic endeavor.

Admissions

Application should be made to the Admissions Office at least six months prior to the quarter the student seeks to enter the University. Quarters begin in September, January and March. The following forms and credentials must be submitted to the Admissions Office before the application can be considered:

A completed application form.

Official credentials from all secondary schools, colleges and/or universities which the student has attended, including subjects, grades and key to the grading system. If credentials are not in English, an official translation must be secured. (Advanced credit from an institution outside the United States will be considered only if a syllabus is presented with the official credentials.)

Results of the Test of English as a Foreign Language (TOEFL) or the results of the Michigan Test. The TOEFL test is administered in the student's home country by the Educational Testing Service (Test of English as a Foreign Language) Box 899, Princeton, New Jersey U.S.A. The Michigan Test is administered by the English Language Institute, Ann Arbor, Michigan.

A complete medical examination record (form provided). Medical forms need not be completed until after acceptance and receipt of I-20.

A nonrefundable application fee of $15.00.

An interview with and/or an application referral from an Institute of International Education representative or other organization representative where feasible.

Certification of financial resources available for education and support while studying at this University.

Scores of Scholastic Aptitude Test (SAT) or American College Test (ACT). Students should contact the College Entrance Examination Board, Box 592, Princeton, New Jersey, to arrange for the SAT test and must ensure that the test results are sent to Youngstown State University. For information regarding the ACT test write to American College Test, P.O. Box 414, Iowa City, Iowa 52240. (The ACT can be taken only in the United States.)

An F-1 student is required by the Immigration Authority to attend for at least one term that school whose I-20 is used to obtain a visa and/or enter the United States. Transfer

to another college or university must be requested from the Immigration and Naturalization Service of the Department of Justice.

Provisional Acceptance

Students meeting all academic requirements, but not reaching the level of English proficiency required, may be admitted provisionally. Qualification for this status will be determined by the Admissions Office based on an English proficiency test score submitted at the time of application. Such students are required to study English *only* until the necessary proficiency is reached.

Transfer Students

Students already attending an educational institution in the United States must apply in accordance with the regular University application closing dates. Transfer students may apply any time during the year, but will be admitted for the fall term only. Students transferring from educational institutions within the United States must be in good standing; those applying for admission to an undergraduate curriculum must have a 2.0 average (on a 4.0 scale). Credits transferred from foreign institutions will be evaluated upon receipt of credentials and syllabi. All credits are evaluated by the Admissions Office.

Educational Requirements

All undergraduate International Students (including transfers from U.S. institutions) and all graduate International Students whose undergraduate degree is from a non-U.S. institution must take on-site proficiency tests prior to registration for classes. (This is in addition to the pre-admission test required.) The on-site proficiency tests will determine whether the student will be enrolled for a full or partial program of study or whether they will be restricted to a special English program that they will continue to enroll in until they reach an acceptable level of proficiency in English. Except in unusual circumstances, this English proficiency requirement must be met within three academic quarters.

All International Students must enroll in an orientation course. Its major purpose is to acquaint the student with the American educational system, American customs and habits, the rules and regulations of the University, necessary legal and governmental information, and study skills. (The above courses are required in addition to normal degree requirements.)

International Students, regardless of transfer credits from foreign institutions, are required to take the general educational requirements as outlined in the catalog. Degree requirements are determined by the school of the student's major area of study.

Students must take a minimum of 12 credit hours each term unless the level of English proficiency prohibits or unless academic progress is unsatisfactory and the Coordinator of International Student Programs rules otherwise.

Finances

Detailed information concerning ability to provide for all expenses is required when applying for admission. Fees must be paid approximately 10 days in advance of each term and all charges are due in full. The University does not carry installment accounts. There is very little financial assistance available from the University in the form of loans or scholarships for the undergraduate International Student.

Employment

According to the immigration laws, International Students are expected to be financially able to care for needs without seeking employment.

International Students are not permitted to work during their first year at Youngstown State University except in unusual circumstances. After the successful completion of one academic year, the student is permitted to seek part-time employment if the need is substantiated; employment at anytime, however, is discouraged. Permission to work off-campus must be granted by U.S. Immigration and Naturalization Services and by the Coordinator of International Student Programs. Permission to work on-campus must be granted by the Coordinator. Permission for summer employment must be authorized by U.S. Immigration authorities. Every student seeking employment should consult with the Coordinator.

No student whose academic progress has been unsatisfactory is permitted to seek employment.

HEALTH SERVICE

A Health Service Office is maintained by the University for the purpose of providing emergency medical care to students while they are on campus. This service is provided at no cost to the student; however, all additional treatment by non-University physicians,

clinics, or hospitals must be paid for by the student. Any accident which results in injury to the student involved should be reported to the Health Service Office within 24 hours.

A voluntary, group accident and sickness insurance program specifically written to meet the needs of University students is available at the time of initial registration for each academic year. A brochure explaining this program is available at the Student Affairs Office and at the Bursar's Office. All foreign students who are not permanent residents of the United States and all residents of the Kilcawley Men's Residence Hall are required to participate in this or a comparable program of Health and Accident Insurance during their entire period of enrollment at Youngstown State University.

The Health Service office is in Beeghly Center, Room 200.

CAREER PLANNING AND PLACEMENT

The University maintains a Career Planning and Placement Service to provide assistance to students in the exploration of occupational objectives and to provide assistance to students and alumni seeking employment. Credentials service is provided to certified teachers applying for positions with schools, colleges, or universities.

Students are also assisted in finding part-time employment while enrolled in the University. The location of the University makes it possible for many students to earn all or part of their expenses by working in nearby stores and industrial plants.

Music students and alumni of the Dana School of Music should also note the placement information in the School of Music section of this bulletin.

STUDENT HOUSING

Admission to the University does not obligate the University to secure living accommodations for the student; personal arrangements must be made because of the diversity of individual needs and desires. The University, however, will assist the student in finding a satisfactory place to live. In accordance with the basic principles of the University concerning human rights, no campus or off-campus housing facility that discriminates on the basis of race, color, or creed will be recommended to students.

On-Campus Housing—The University has residence hall facilities for 200 men. Residence hall accommodations include room and food service on a contract basis for the quarter(s) requested. For charges see *Fees and Expenses.* Further information and applications can be obtained by writing to the Auxiliary Services Office.

Off-Campus Housing—The Housing Office (Room 115 Kilcawley Hall) maintains a card file of available housing in the University area and a card file of students seeking roommates; these files must be reviewed in the Housing Office. The University does not place students in off-campus housing; therefore personal arrangements must be made for these facilities.

LOCKERS

The University provides lockers for full-time students, without charge beyond a small sum to cover clerical costs. For this handling charge see *Fees and Expenses.* Two students are assigned to each locker. At the end of each term, or earlier if the student withdraws from the University, all personal effects must be removed from the locker. The University assumes no responsibility for personal property left in a locker at any time.

STUDENT ACTIVITIES

Youngstown State University offers numerous opportunities to interested individuals who want to get involved in student activities. Areas of involvement include Student Government, Kilcawley Center Program Committees, sports and recreational activities, service organizations, religious groups, academic, political and professional organizations, and social fraternities and sororities. There are over 130 student organizations and groups in which to get involved. In addition, a varied social and cultural program is provided to students including concerts and musical groups, performers, speakers and lecturers, and dramatic groups.

The University feels that involvement and participation in extracurricular activities can make a significant difference in the quality of a student's college experience. Involvement offers students the opportunity to explore and pursue a wide range of interests outside the formal classroom setting. Other benefits of involvement include the development of leadership skills, self confidence and social poise, and expanded friendships.

In order to facilitate involvement in student activities, the University has provided an office — the Student Activites Office — with a full-time staff to assist students in finding

areas of involvement to meet their interests and needs. The Student Activites Office, located on the second floor of Kilcawley Center, is responsible for the development and coordination of student organization programs and other student-oriented cultural and recreational events to ensure a well-balanced and responsive activites program.

STUDENT GOVERNMENT

The student body of Youngstown State University is represented by the Student Government, which operates under constitutional powers granted by the University. The legislative branch of Student Government, Student Council, is composed of representatives from six undergraduate units, the College of Arts and Sciences, the School of Business Administration, the School of Education, the School of Engineering, the College of Fine and Performing Arts, and the College of Applied Science and Technology, in proportion to the enrollment in each. All meetings of the Student Council are open to the student body, and any matter may be brought before a meeting by requesting beforehand that it be included in the agenda for the meeting.

Student Government exercises the power to conduct student elections, to hear appeals from groups or individuals, to recommend students to serve as members of joint faculty-student committees, and to supervise programs financed from its operating budget.

REGISTERED STUDENT ORGANIZATIONS

A wide variety of student organizations comprise the more than 130 groups registered by the University. Nearly any interest, hobby, or activity preference may be pursued through these organizations. In addition, if an organization does not exist to meet your specific needs, it is very simple to get together with a group of other interested students and form a new organization.

Areas of student organization involvement include academic-related honor societies and professional associations, religious organizations, political and social action groups, international and cultural organizations, social fraternities and sororities, and numerous special interest groups. Further information on student organizations and how to get involved can be obtained from the Student Activities Office in Kilcawley Center.

HONORARY ORGANIZATIONS

Established to recognize outstanding academic achievement by University students, Youngstown State University provides several honorary organizations related to academic majors and departments. Many of these honorary organizations are local chapters of national honor societies, which provide national recognition and local scholarships.

For more information on honorary organizations in your area of academic concentration, contact the faculty department chairman of that area, or the Student Activities Office, second floor, Kilcawley Center.

Alpha Phi Sigma-Law Enforcement Honor Society
Alpha Psi Omega-Honorary Dramatic Fraternity
Alpha Tau Gamma-Honorary Accounting Fraternity
Gould Society-Liberal Arts Honor Society
Kappa Delta Pi-Education Honor Society
Lambda Tau-Medical Technicians Honor Society
Omega Chi Epsilon-Chemical Engineering Honor Society
Omicron Delta Epsilon-Economics Honor Society
Omicron Lambda-Honorary Biology Fraternity
Phi Kappa Phi-National Honor Society for Achievement in All Fields
Sigma Delta Pi-Spanish Honor Society
Sigma Xi-Scientific Honor Society
Tau Beta Pi-Engineering Honor Society

KILCAWLEY CENTER

Kilcawley Center is the community center of the University, for all the members of the University family — students, faculty, administration, alumni, and guests. It is not just a building; it is also an organization and a program. Together they represent a well-considered plan for the community life of the University.

As the "living room" or the "hearthstone" of the University, the Center provides for the services, conveniences, and amenities the members of the University family need in their daily life on the campus and for getting to know and understand one another through

informal association outside the classroom.

Kilcawley Center is part of the educational program of the University. As the center of University community life, it serves as a laboratory of citizenship, training students in social responsibility and for leadership in a democratic society.

Through its various boards, committees, and staff, it provides a cultural, social, and recreational program, aiming to make free time activity a cooperative factor with study in education.

In all its processes it encourages self-directed activity, giving maximum opportunity for self-realization and for growth in individual social competency and group effectiveness. Its goal is the development of persons as well as intellects.

Kilcawley Center attempts to meet the diversified needs of the University Community in its food service program. The Snack Bar, which has been contracted to Hardees Food Systems, offers a variety of fast foods designed to meet the needs of today's commuting student. A full breakfast is offered beginning at 7:00 a.m., while the evening student arriving after work may choose from a varied menu including roast beef sandwiches. For those not taken by the fast food craze; breakfast, a full cafeteria-style menu, as well as a variety of hoagie sandwiches is offered in the first floor Brief Eater.

For those who wish to dine in a more relaxed atmosphere, The Wicker Basket offers a choice of table service menu items, or a moderately priced buffet style meal including a salad bar. In addition to the Wicker Basket, the second floor houses dining facilities for students living in the Kilcawley Men's Residence Hall. Students who are not residents may purchase a quarterly meal ticket and dine in the Resident Dining Hall.

Groups who wish to avail themselves of Kilcawley Center catering services may choose from a selection of buffet and table service menus, served in a variety of attractive conference rooms, with service available for groups of up to 350 persons.

STUDENT PUBLICATIONS

Student publications of the University are under the supervision of the University Publications Committee, a student-faculty-administration committee.

The *Jambar*, a newspaper published twice a week; the *Neon*, the University yearbook; and *The Penguin Review*, a literary magazine, are published by student staffs. All three are supported from student activity fees; the *Jambar* accepts advertising, which accounts for a large part of its budget. The *Jambar* also serves as a laboratory for those students enrolled in the English Department's journalism courses.

The Polyglot, published three times a year, is a magazine featuring informative articles and creative prose and poetry written by students in the various foreign languages taught at Youngstown State University.

DEBATE AND OTHER FORENSIC ACTIVITIES

The forensic program at the University divides itself into three areas — intercollegiate debate, intercollegiate individual events, and community presentation programs.

The debate team participates in numerous multi-school tournaments each season, including tournaments on both the national debate question and a variety of unique and short-term questions.

Youngstown is one of the few mid-American schools participating in parliamentary debate, regularly confronting both Ivy-League and Canadian universities.

The individual events team also participates in a multitude of tournaments including those at Marshall University, Ohio University, and University of Toledo. Competition involves several events such as oratory, extemporaneous speaking, and oral interpretation.

The University forensic team is also involved in the presentation of topical debate programs to area clubs and organizations, offering the Youngstown area a view of forensics in action as well as information on topics of current national interest.

Participation in the University forensics program is open to all students. Continued activity may qualify the student for membership in the University chapter of Pi Kappa Delta, the national honorary fraternity.

THEATRE

All students at the University are invited to participate in the production of plays. The University Theatre presents four major productions each academic year. Each production is under the supervision of the faculty of the Speech Communication and Theatre Department. Recent productions

have included *The Miracle Worker, Medea, The Good Woman of Setzuan, The Glass Menagerie, Inherit the Wind, The Runner Stumbles,* and *Wonderful Town.*

The University Theatre also sponsors a series of Classic International Motion Pictures each year. In addition, they have inaugurated a program through which a special month-long salute is made to some foreign country's contribution to world culture. Salutes thus far have been made to Germany, France, Great Britain, Italy, Spain, and Ireland. A special week-long program called Theatre YSU — the format of which varies from year to year — is sponsored each spring. Also, in conjunction with the spring production, a high school drama workshop is conducted for all of the high schools within the Youngstown area.

Another feature of the University Theatre is its sponsorship each spring of student-directed one-act plays which are selected for presentation through open competition.

Presently, major University Theatre productions are performed in Ford Auditorium in Bliss Hall. Some of the other productions are presented in the Experimental Theatre.

Alpha Psi Omega is the national honorary fraternity open to students who distinguish themselves in scholarship and theatre.

MUSICAL ORGANIZATIONS

Several campus musical organizations are open to all students of the University. For these see the Dana School of Music section.

ART EXHIBITS

At the invitation of the Butler Institute of American Art, the Art Club has for many years sponsored an annual exhibition of the work of Youngstown State University art students. The work is displayed at the Institute for about a month in the early spring, with awards from various donors.

Student and faculty exhibits are periodically held in the Kilcawley Center Gallery and the department gallery. The Butler Institute of American Art sponsors three annual competitive exhibits (Autumn Annual of area artists, the National Mid-year, and the statewide Ceramic/Sculpture) which are available to the students.

Each year the Union National Bank sponsors a student show which is presented in the downtown branch bank.

INTERCOLLEGIATE ATHLETICS

Intercollegiate athletics are conducted at Youngstown State University to enlist the interest of the entire student body in healthful amateur sports. Participation is open to any member of the student body who qualifies under the regulations of the Youngstown State University Athletic Policies. Intercollegiate competition is provided in baseball, basketball, football, golf, rifle, soccer, swimming, tennis, and wrestling. Additional intercollegiate sports have been designated for women's competition in basketball, field hockey, gymnastics, softball, swimming, synchronized swimming, and volleyball.

The University is governed by the National Collegiate Athletic Association and the Association for Intercollegiate Athletics for Women, and is a member of the Mid-Continent Athletic Association, Lake Erie Intercollegiate Rifle Association, Midwest Association for Intercollegiate Athletics for Women, Ohio Association for Intercollegiate Sports for Women, National Rifle Association, Western Reserve Athletic Conference, and United States Field Hockey Association.

Any student should feel free to seek membership or position in any of the sports mentioned. If they desire to compete, please contact the Athletic Offices in Beeghly Physical Education Center.

AWARDS AND PRIZES

The Harry S. Truman Scholarship Foundation, established by Congress as the official Federal memorial to honor the thirty-third President of the United States, is a permanent education scholarship program designed to provide opportunities for outstanding students to prepare for careers in public service.

Who's Who Among Students in American Universities and Colleges Awards given to juniors and seniors achieving outstanding academic and co-curricular records.

The Youngstown Vindicator Awards. Four cash awards are made annually as follows:

To the best all-around student, on the basis of academic achievement and extra-curricular activity through four years of college: $200.

To the student ranking first in humanities, on basis of four years of study: $100.

To the student ranking first in English, on the basis of four years of study: $100.

To the student ranking first in social science sequence courses: $100.

Other Awards

The Interfraternity Council Scholarship Awards are presented annually to both the fraternity chapter and to the individual member of the fraternity system who achieve the highest aggregate point index, based on the academic work of the previous three quarters. The awards are presented during Spring Quarter at Greek Sing.

The Panhellenic Council Scholarship Awards are presented to both the sorority chapter and to the individual member of the sorority system who achieve the highest aggregate point index, based on the academic work of the previous three quarters. The awards are presented during Spring Quarter at Greek Sing.

THE HONOR SOCIETY OF PHI KAPPA PHI

Purpose

The primary objective of the national Honor Society of Phi Kappa Phi is the recognition and encouragement of superior scholarship in *all* academic disciplines.

Membership

Undergraduate students are eligible for consideration who have senior status and are scholastically in the upper 10% of their class; or who have reached the final period of their junior year and are scholastically in the upper 5% of their class.

Graduate students may be elected but their number must not exceed, for the year, 10% of the number of graduate students enrolled during the year.

Faculty members and alumni who have achieved scholarly distinction may, in limited numbers, be elected to membership.

An occasional honorary member may, with the approval of the Board of Directors, be elected by a chapter.

Fellowships

For first-year graduate work the Society offers annually an average of 25 fellowships, on a competitive basis, to graduating students who have been initiated into the Society and who have also been nominated by their chapters for the competition. It also awards one second-year graduate scholarship.

College of Applied Science and Technology

The American Society of Civil Engineers, Youngstown Branch, Award in Civil Engineering Technology is granted annually to the outstanding graduate in civil engineering technology.

The American Society of Mechanical Engineers, Youngstown Section, Award in Mechanical Engineering Technology is granted to the outstanding graduate in mechanical engineering technology.

The Mosure and Syrakis Company, Limited, Award in Civil Engineering Technology is granted annually to the graduate in civil engineering technology who is deemed by the faculty to represent the best overall graduate completing the degree program on a part-time basis.

The Woman's Board of Youngstown Hospital Association Award for excellence in nursing—three awards are given annually to the graduating student in the Associate Degree Program in Nursing. (The amount of the award is determined by the scholarship committee annually.)

The National Business Education Association (NBEA) Award of Merit is given annually to a business Education major in recognition of outstanding achievement. Selection is determined by vote of Business Educationand Technology faculty.

College of Arts and Sciences

The American Chemical Society Student Affiliates Award to the graduating senior with the highest cumulative point average.

The American Institute of Biological Sciences, University Chapter Award to the outstanding freshman in biological sciences.

The American Institute of Chemists Award to the outstanding senior in chemistry.

The American Legion (Post 15) Awards to two cadets who rank in top 25% of academic class and have demonstrated outstanding leadership traits.

The Department of the Army Superior Cadet Ribbon Award to the outstanding student in military science.

B'nai B'rith Undergraduate History Award of $50 to the outstanding undergraduate history student.

B'nai B'rith Graduate History Award of $50 to the outstanding graduate history student.

Los Buenos Vecinos Art Award is a $10 prize given by the YSU Spanish Club for the best drawing shown at the annual Youngstown State University Art Exhibition.

The Chemical Rubber Company Award in chemistry provides an award for superior achievement in freshman chemistry.

The Frank M. Clark Memorial Award is presented to the graduating senior in physics who has the highest cumulative point index and who has been admitted to graduate study.

Daughters of the American Revolution Award is a gold medal presented annually to the graduating cadet in the top 25% of the R.O.T.C. and academic class.

Delta Phi Alpha National German Honorary Society annually awards a silver medal to a German major who has excelled in the study of German.

The Distinguished Military Graduate Honor Award is presented by the President of Youngstown State University to designated distinguished military graduates.

The Dean Gillespie Award is presented to the R.O.T.C. senior who has most demonstrated all facets of leadership.

The Robert R. Hare Writing Award provides $500 to an English major at YSU who has demonstrated distinction in writing ability.

The Department of History—Chairman's Award of $25 is given for the best undergraduate research paper in any field of history.

The Mahoning Chapter, Reserve Officers Association R.O.T.C. Honor Awards are medals presented to the cadet completing the basic course who is selected for and enrolls in the advanced course, and to the cadet completing the advanced course who is commissioned in the Officers Reserve Corps of the Army of the United States and who best exhibited the qualities of leadership.

The Evangelos Meshel Memorial Award in Greek offers an award for the best student in elementary ancient Greek or excellence in advanced Greek.

The Nathan Hale Chapter, Sons of the American Revolution Awards are presented to the R.O.T.C. cadet who completes the basic course with outstanding excellence in all academic subjects, and to the cadet who completes the advanced course with outstanding excellence.

The Omicron Lambda Honorary Biology Fraternity Award for Scholarship ($25) to an outstanding graduating biology student.

The President-Professor of Military Science Award. A Regular Army sabre is presented to that senior cadet who is judged by the Military Science Cadre to be the most outstanding student in his class.

The Armed Forces Communications and Electronics Association Award is presented to the outstanding senior R.O.T.C. cadet majoring in electrical engineering.

The Association of the United States Army Medal is awarded to the cadet completing the first year of the advanced course who is the most outstanding in all academic subjects and who has completed one full year of the R.O.T.C. program at YSU.

The Peter I. Wenzen Award is an annual cash award given by the Youngstown State University Geological Society and friends to a junior or senior majoring in geology who is in need of financial assistance.

The Wolves Club Awards in Advanced Latin is presented for meritorius work in Latin on the Upper Division level.

The Wolves Club Awards in Intermediate Latin are presented for meritorious work in Latin on the intermediate level.

School of Business Administration

The Alpha Delta Sigma National Professional Advertising Society offers an award annually to an outstanding senior who is a member of the advertising fraternity.

Alpha Kappa Psi awards annually the Scholarship Key to the senior with the highest scholastic average pursuing a degree in the School of Business Administration.

The Alpha Tau Gamma Fraternity Award is given annually to the member of the fraternity who has contributed the most to the University through a combination of academic proficiency and extracurricular activities.

The American Production and Inventory Control Society Award is given to a graduating senior in the School of Business Administration completing courses in management with the highest point average.

The Mahoning Valley Chapter of the Ohio Society of Certified Public Accountants Award is presented to the student selected as the outstanding participant in the accounting internship program.

The National Association of Accountants Award is presented to the graduating senior with the highest point average in accounting.

The Wall Street Journal Student Achievement Award is given to a senior with out-

standing scholastic performance. This award consists of a year's subscription to the Wall Street Journal and a plaque.

School of Education

The Frieda F. Chapman Award. The School of Education annually presents an award to an Elementary Education major who shows evidence of becoming an outstanding elementary school teacher.

The George M. Wilcox Award. The School of Education annually presents an award to a Secondary Education major who shows evidence of becoming an outstanding secondary school teacher.

The Department of Special Education Award is given annually to a Special Education major who, as a senior, exhibits exemplary scholarship and potential to work with exceptional individuals.

The Kappa Delta Pi Award is given annually by the society to a member who, as a senior, exhibits outstanding scholarship, leadership, character, and service to the organization.

William Rayen School of Engineering

The American Chemical Society Student Affiliates Award is a copy of Van Nostrand's Chemists' Dictionary or another suitable book presented annually to the graduating senior with the highest cumulative point average in chemistry and chemical engineering courses as a full-time student.

The Institute of Electrical and Electronics Engineers, Sharon Section, Award in Electrical Engineering is given annually to the outstanding graduate in Electrical Engineering.

The American Institute of Industrial Engineers Award in Industrial Engineering is given to the graduating industrial engineering student having the highest scholastic record.

The American Society of Civil Engineers, Youngstown Branch, Award in Civil Engineering granted annually to the outstanding graduate in civil engineering.

The Louis A. Deesz Memorial Award is given by the Mahoning Valley Chapter of the Ohio Society of Professional and Registered Engineers, Tri-County Section, to the graduating engineering student outstanding in academic achievement.

Professor Luginbill Chemical Engineering Award.

College of Fine and Performing Arts

Dean's Award, Outstanding Member of Sigma Alpha Iota Honors Certificate Award.

The Union National Bank Award gives $200 as a prize for the most outstanding work of art in the annual student exhibit which is presented in the downtown branch.

The Los Buenos Vecinos Art Award Los Buenos Vecinos, The Youngstown State University Spanish Club gives a prize for the best drawing in the annual Student Art Exhibition.

FINANCIAL AIDS

The University has a comprehensive program of financial assistance developed to aid primarily the student with ability to succeed in college who needs financial aid to help pay educational costs. It recognizes also students of academic excellence. This program includes four basic types of financial aid: (1) loans, (2) grants-in-aid, (3) scholarships, and (4) part-time on-campus employment. The program is under the supervision of the Director of Student Financial Aids. Inquiries concerning any of the types of financial aid should be addressed to the Office of Student Financial Aids.

Entering freshmen, enrolled students and transfer students seeking financial assistance should apply by submitting a Youngstown State University Financial Aid Request (FAR) form prior to the first day of April preceding the academic year for which aid is desired.

Most awards are made in June. One-third of the total amount awarded may be used by the recipient for payment of University fees and other educational costs each quarter beginning with the fall quarter. A new Financial Aid Request is required each year. All forms that should be submitted are available in the University Office of Student Financial Aids.

To assure appropriate and impartial distribution of financial assistance awards based upon financial need, the University utilizes the need analysis services of the College Scholarship Service (CSS) and the American College Testing (ACT) Program. Each aid applicant should submit not later than April 1 either a Financial Aid Form (FAF) to the CSS, or an ACT Family Financial Statement (FFS) to the American College Testing Program.

LOANS

Loans are repayable awards to students with amounts determined by financial need.

Loans are based on a consideration of (1) financial need, (2) ability to make a creditable academic record, and (3) character.

The University participates in the federal National Direct Student Loan, Nursing Student Loan, and Law Enforcement Student Loan programs.

The YSU Instructional Fee Loan Fund makes funds, available for not more than 60 days, if justified by emergency conditions.

Students desiring long-term educational loans may apply at their local bank or other lending institutions for funds under the Loan Guaranty Program, whereby the federal government subsidizes the interest while the student is enrolled and until repayment begins 9-12 months after leaving college.

Additional limited student loan funds administered by the Youngstown Educational Foundation are as follows:

The Clara Hincy Fund. The will of Clara Pearl Hincy in 1962 provided approximately $20,000 to be used to make loans to deserving, talented students in the Dana School of Music for the purpose of paying fees in that school.

The Paul E. Shields Scholarship Loan Fund. This fund, established in 1961, is available to mathematics and engineering students of junior or senior rank who have maintained a 3.25 average in these disciplines.

The K. B. MacDonald-MacKenzie Muffler Memorial Fund. This fund, established in 1968, is available for short-term loans to needy students.

Applications for loans from these funds should be made to the University Office of Student Financial Aids.

GRANTS-IN-AID

Grants-in-aid are monetary gifts to students, frequently in combination with another type of financial aid, especially loans, with the amount determined by financial need.

Grants-in-aid are also based on (1) ability to make a creditable, though not necessarily an outstanding academic record, and (2) character.

All applicants for financial assistance based on financial need should apply for Basic Educational Opportunity Grants which are U.S. government awards intended to provide financial assistance for those who need it to attend post-secondary school educational institutions. The maximum grant permissible under this program is $1,600 minus the amount the student and his or her family are expected to contribute to meet educational costs. Actual grants, however, may be less than this maximum since they are based on two additional factors: the amount of funds actually available to finance the program country-wide, and the cost of education at the institution attended. Application materials and information about these grants are available from high school guidance counselors and from the YSU Office of Student Financial Aids.

Youngstown State University participates in the Supplemental Educational Opportunity Grant Program, which makes funds available to students of exceptional financial need who without this money would be unable to attend college. These grants range up to $1,500 depending upon family income, but may not exceed 50 per cent of the total financial assistance the student receives.

The Nursing Scholarship Program is similar to the Supplemental Educational Opportunity Grant Program, making funds available to nursing students of exceptional financial need.

Law Enforcement Student grants are available for full-time employees of publicly funded law enforcement agencies who are enrolled in programs leading to a degree in an area related to law enforcement.

All Ohio residents desiring financial assistance based on financial need should apply for Ohio Instructional Grants. These are State of Ohio awards made to full-time students of exceptional financial need who are permanent Ohio residents and in good standing academically. The amount of the award will vary depending upon the family's adjusted effective income and the number of dependent children in the family. Applications are available in the University Office of Student Financial Aids and from high school guidance counselors. Upon completion these applications are submitted to the Ohio Board of Regents in Columbus, Ohio, for processing.

SCHOLARSHIPS

Scholarships are gift awards to students of outstanding academic qualifications. Award

amounts vary depending upon academic ability and financial need.

Scholarships for entering freshmen are awarded on the basis of (1) high school record, (2) recommendation of high school administrators, and (3) score on a standard college entrance test. The basis of awards to enrolled students are (1) University record, (2) character, and (3) financial need.

Scholarship funds have been created for Youngstown State University students by individuals, corporations, clubs, religious and fraternal organizations, and friends of the University. Many of these funds are administered by the Youngstown Educational Foundation. This makes it possible for the Foundation to provide funding for several hundred scholarship awards each year.

Sponsored scholarships with the qualifications required of their recipients are listed below. An applicant for a scholarship award is automatically considered for each scholarship for which qualified.

The American Association of University Women, Youngstown Branch, Scholarships. This scholarship was established in 1950. A grant of $700 is awarded each year by the Youngstown Branch of the American Association of University Women to an upperclass woman student, on the basis of high scholarship and financial need.

The American Business Women's Association Scholarship. The scholarship, instituted in 1957, is provided by the Youngstown Chapter of the American Business Women's Association. It is awarded to a woman in the field of business administration.

The American Society for Women Accountants. This scholarship, established in 1963, is awarded to a woman majoring in accounting or secretarial accounting.

The Shari Beyer Scholarship. This scholarship is presented quarterly to either a full-time or part-time junior or senior majoring in geology or earth science. It normally pays the University quarterly instructional and general fees. The recipient is chosen by the chairman of the Department of Geology.

The Builders Association of Eastern Ohio and Western Pennsylvania Scholarship. This tuition scholarship is awarded each year by the Builders Association of Eastern Ohio and Western Pennsylvania to an entering freshman in civil engineering technology. The recipient must be a full-time student and will continue to receive tuition for two years through graduation with the associate degree as long as academic standards are met and full-time student status is maintained.

The Business and Professional Women's Club Scholarship. A scholarship is awarded to an upperclass woman by the Business and Professional Women's Club of Youngstown.

The CIO Local No. 1331 Scholarship. This scholarship for the amount of in-state fees, established in 1961, is awarded to a son or daughter of a member of CIO Local No. 1331 at the Republic Steel Corporation.

Copperweld Steel Company's Warren Employees' Trust Scholarship. This scholarship was established by the employees of the Copperweld Steel Company in Warren, Ohio, to aid deserving and able employees of Copperweld Steel Company, or their dependents, to secure a college education. The number of awards and the amount of each award is dependent upon available funds, number of employees of the company applying for an award, and each applicant's financial need and academic promise.

The Diamond Shamrock Corporation Scholarships. Diamond Shamrock Corporation gives funds for scholarships to outstanding students in chemical engineering. The awards are made on the recommendation of the chemical engineering faculty.

The Electrical League of Eastern Ohio, Inc. Scholarship. The Electrical League of Eastern Ohio, Inc., in 1974 established this scholarship program for students enrolled in electrical engineering or electrical engineering technology curriculums at Youngstown State University. The League announces annually the number of awards they will support to meet the cost of tuition and fees. The selection of scholarship recipients is made by chairmen of the academic departments concerned in coordination with the YSU Director of Student Financial Aids.

The General Extrusion, Inc., Scholarship. This $500 scholarship was established to aid deserving and able employees of General Extrusion, Inc., or their dependents, to secure an education at YSU. It is awarded annually to an entering freshman who is a three-year employee with the company, or a dependent of a three-year employee, retiree, or former employee who became deceased while still associated with the firm. It is renewable for up to four academic years provided the student maintains the scholarship level and fulfills the requirements which govern the scholarship.

The Harry K. Graebing Athletic Scholarship. This scholarship was established in 1969 by Mildred N. Graebing in memory of her husband, Harry K. Graebing. The income from an endowment of $15,000 makes possible annual awards to deserving Ohio or Pennsylvania student participants in University athletics.

The Mildred N. Graebing Scholarship. This scholarship was established in 1973 by Mildred N. Graebing. The income from an endowment of $10,000 makes available annual awards to deserving Ohio or Pennsylvania students who are enrolled full-time in degree courses in business education and/or secretarial studies.

The Dorothy Zola Greenberger Memorial Scholarship. This scholarship was established in 1971 by Sidney Greenberger in memory of his wife, Dorothy Zola Greenberger, a former member of the YSU faculty. The income from an endowment makes possible an annual award to a student or students with academic ability enrolled in the College of Arts and Sciences.

The Harris Scholarship. This is an annual award to help defray the tuition costs of a student majoring in either geology or earth science at Youngstown State University. The recipient of this award is either a sophomore, junior or senior who has demonstrated an above-average potential in the geological sciences and who is in need of financial assistance. The recipient is chosen by the chairman of the Department of Geology.

The Junior Civic League Scholarships. These scholarships, established in 1961, are awarded to worthy students by the Junior Civic League of Youngstown.

The Ohio Masonic Lodge Scholarship. This scholarship of $400 was established in 1963 by the Grand Lodge of Masons of Ohio and is awarded to a worthy student.

Midland-Ross Corporation Scholarships. These scholarships, to deserving students from the Sharon, Pennsylvania area, are made possible by funds contributed by the Midland-Ross Corporation.

The Dean Robert L. Miller Scholarship. This annual scholarship was established in 1966 by Alpha Tau Gamma honorary accounting fraternity of Youngstown State University for students in the field of accounting. Students eligible for this award must be upperclassmen having acceptable scholastic standing and needing financial assistance. Recipients are selected by the Dean of the School of Business Administration.

The Nellie P. Nick Music Scholarship. This scholarship was established in 1971 by Mildred N. Graebing in memory of her mother, Nellie P. Nick, in recognition of her 100th birthday anniversary. The income from an endowment of $5,000 makes possible annual awards to deserving women students who are enrolled in the Dana School of Music.

The Margaret I. Pfau English Department Scholarship. This scholarship was established in 1973 by the faculty of the YSU English Department to memorialize Dr. Pfau who served with distinction as chairman of the department. One scholarship will be provided annually from 1974 through 1978 to a student majoring in English; each year the scholarship will amount to approximately $300. The recipient will be selected by the English Department.

The Margaret Pfau Linguistics Scholarship. This scholarship was established in memory of Margaret Pfau by her brother William E. Pfau in 1974. The award is made to an undergraduate linguistics student selected by the English Department.

Army R.O.T.C. Scholarships. These scholarships, established by the Department of the Army in 1965, pay for tuition, books, and other administrative fees. In addition, the recipients receive a subsistence allowance of $100 a month. High school seniors are eligible to apply for four-year scholarships. Freshmen enrolled in the first year of the four-year R.O.T.C. program may apply for three-year scholarships. Sophomores enrolled in the second year of the four-year R.O.T.C. program may apply for two-year scholarships. Juniors enrolled in the third year of the four-year R.O.T.C. program may apply for one-year scholarships.

The Dora Schwebel Scholarship. This scholarship was established in 1968 by the family of Mrs. Dora Schwebel as a memorial to her. Students in the School of Education who desire to study to prepare to teach the mentally retarded and are agreeable to teaching in the Mahoning County School for the Retarded may apply. This scholarship is awarded to a student needing financial assistance and is renewable for up to a total of four years subject to good academic progress, continuing financial need, and the availability of funds.

The Georgene M. Smith Scholarship. This

scholarship was established in 1972 with funds bequeathed by Georgene M. Smith for awards to YSU students in botany, geology and forestry in recognition of service performed by the Trumbull Arboretum and Conservation Association.

The Louis and Julia Spitzer Memorial Scholarships. These scholarships were established in 1961 to assist students of the Jewish faith who are attending the University and need financial assistance.

The Yo-Mah-O Chapter, National Secretaries Association Scholarship. This scholarship which pays in-state fees is provided by the Youngstown Chapter of the National Secretaries Association (International). It is awarded to a woman interested in completing the two-year secretarial course and qualifying for the Associate in Applied Business degree.

The Youngstown Association of Purchasing Agents Scholarship. This annual award is made by the Youngstown Association of Purchasing Agents to a student majoring in industrial merchandising. Selection of recipient is based upon financial need and academic excellence.

The Youngstown Sheet and Tube Company Scholarships. These scholarships were established in 1951 by the Youngstown Sheet and Tube Company. Two types of scholarships are awarded: four-year scholarships for dependents of company employees that provide tuition and fees for full-time students, and one-year renewable scholarships for company employees that provide tuition and fees for part-time students. Further details are available from the Youngstown Sheet and Tube Company. Applications are submitted to the company.

THE YOUNGSTOWN EDUCATIONAL FOUNDATION SCHOLARSHIPS

These scholarships vary in amount according to established need and academic ability. The maximum amount normally does not exceed tuition and fees of the academic year, fall, winter and spring quarters.

Applications are made to the University Office of Student Financial Aids. Selection is made by representatives of the University and the Foundation.

In addition to the awards made in the name of the Youngstown Educational Foundation, they control funds for the following scholarships:

The William W. Battin Scholarship. This scholarship was established in 1973 as a memorial to Mr. William W. Battin by his wife, Mrs. Margaret P. Battin, and by Judge and Mrs. Reed Battin. Income from the endowment will be used for annual scholarship awards to worthy YSU students in need of financial assistance to pay educational costs.

The Eugene C. Beach Memorial Scholarship. This scholarship was established in 1976 by the members and friends of First Christian Church of Youngstown, Ohio as a memorial to Dr. Eugene C. Beach, minister and national president of Tau Kappa Epsilon fraternity. The income from the endowment provides an annual award to a worthy and needy member of Epsilon Iota, local chapter of Tau Kappa Epsilon. The Board of Control of Epsilon Iota shall recommend a candidate for the award.

The LaRue R. Boals Scholarship. This scholarship, established in 1961, provides for a scholarship of $250 to be awarded annually to a worthy student of the Dana School of Music.

The Colonel Lloyd Booth Scholarship. This scholarship was established in 1965 by the Mahoning Chapter Reserve Officers' Association as a memorial to Colonel Lloyd Booth. It pays for the military science tuition during the recipient's junior year in the advanced course. Selection is based on the student's academic and military record, and on need. Awards are made to juniors.

The Bucheit Scholarship. This scholarship of $500 was established in 1963 by The Joseph Bucheit and Sons Company. It is awarded annually to a student in civil engineering whose parent is employed by this company.

The James W. DeGarmo Criminal Justice Scholarship. This scholarship was established in 1976 by the Law Enforcement Honor Society of the Criminal Justice Department of Youngstown State University. Its purpose is to give recognition for the contributions to the profession of law enforcement and criminal justice education by James W. DeGarmo. Upperclassmen demonstrating scholastic and outstanding performance as criminal justice students are eligible for this award.

The Dow Chemical Company Outstanding Junior Award. The Dow Chemical Company makes an annual award to an outstanding junior in each of the departments of Chemical Engineering and Materials Science and Marketing. The recommendations of the out-

standing students are made by the academic department.

The Karl W. Dykema Scholarship. This scholarship was established in 1972 as a memorial to Karl Washburn Dykema, former dean of this University's College of Arts and Sciences. An annual award is made to a full-time student who has a distinguished academic record in the College of Arts and Sciences.

Electrical Engineering Grant. This award was made possible by a gift from a retired faculty member of the Department of Electrical Engineering. It provides an annual award of $200 to a needy undergraduate sophomore, junior or senior student of electrical engineering with an adequate scholastic record. This award may be granted after all of the candidate's other sources of financial aid are exhausted.

The Cora E. Emerson Memorial Scholarship. This scholarship was founded in 1972 under the will of Cora E. Emerson. It provides an annual award to a deserving and needy full-time female student attending Youngstown State University.

The Hilda George Hanna Scholarship. This scholarship, established in 1964, provides an annual award to a woman who is a full-time student in the secretarial department.

Gertrude E. Hendricks - Family Life Scholarship This scholarship is available to be awarded annually to any student in the graduate school of Youngstown State University whose undergraduate major has afforded preparation for an effective contribution in the family life area.

Hynes Industries, Inc. Scholarships. This scholarship program, established in 1973, provides for two annual $500 awards. Priority is given to children of Hynes Steel employees who are incoming freshmen students. If there are not two qualified priority candidates, preference will be given to other undergraduate students who are dependents of Hynes Steel employees. Applications for these awards are submitted to the YSU Office of Student Financial Aids.

The William Jenkins Award. This award is made possible by a bequest of Alice W. Bergman, the income from which is used for a grant to a deserving male student of the University.

The Edwin Lovell Scholarships. These scholarships, established in 1958, are usually in the amount of tuition and fees for the academic year. In number they have varied from one to three, according to qualifications of applicants.

The William F. Maag, Jr., Scholarship. This scholarship was established in 1947 in honor of William F. Maag, Jr., by his friends. The revenue from invested capital pays $330 for one year to an upperclassman.

The William F. Maag, Jr.-Vindicator Scholarship. This scholarship was established in 1971 by the Youngstown *Vindicator* as a memorial to William F. Maag, Jr., whose leadership was instrumental in the development of the communication media, higher education, and civic affairs in the Youngstown area. Revenue from invested capital makes possible annual awards to worthy students based upon financial need and academic excellence, especially those majoring in the humanities.

The Mahoning-Trumbull Police Wives Association Award This is a $250 award made by the above association for worthy and/or needy students at YSU who are sons or daughters of police officers in Mahoning or Trumbull Counties.

The Harry and Helene Meyer Freshman Scholarship. This scholarship of $400, established in 1955, is for a freshman planning to major in business administration or economics. The recipient is selected annually on the basis of superior scholarship and financial need.

The Tom Pemberton Memorial Scholarships. Two four-year scholarships of $400 are awarded to graduates of Mahoning County high schools—one to a man, one to a woman —from an endowment contributed as a memorial to Tom Pemberton. The recipients must be in the upper two-thirds of their high school classes.

The Margaret I. Pfau Scholarship. This scholarship was founded in 1973 under the will of Margaret I. Pfau, who served with distinction as chairman of the Youngstown State University Department of English. Income from the fund provides two annual $500 awards to students majoring in English who have demonstrated academic excellence while attending Youngstown State University.

The Joseph Potochny Scholarship. This scholarship, made possible by a bequest of Joseph Potochny in 1963, is awarded to a needy and deserving student of Ukrainian background.

The Haig-Ramage Scholarships. Income from the Haig-Ramage Scholarship Fund makes possible the granting of scholarships for $300 each for the freshman year. Selection is on the basis of scholastic and leadership qualities and need for assistance.

The Herman C. Ritter Scholarship for the Violin. The endowment from the estate of Miss Juliet L. Ritter was made available in 1957, the income of which is used for a scholarship award to a student who intends to make a career of music, who shows particular promise in the playing of the violin, and who is without sufficient means to provide himself or herself with the education and training in music.

The John R. Rowland English Scholarship. This scholarship, established in 1957, is available annually to an outstanding student majoring in English. The stipend is the income from the John R. Rowland Scholarship Fund.

Joseph E. Smith Scholarship. This scholarship, established in 1971 by friends of Dr. Joseph E. Smith as a memorial to him, provides funds for a worthy and needy student to attend Youngstown State University.

The Lawrence M. Stolle Athletic Scholarship. This scholarship was established in 1973 by the Greater Youngstown Old Timers Association and other sports enthusiasts to honor Lawrence M. Stolle as Sports Editor of the *Youngstown Vindicator.* The income from an endowment makes possible annual awards to deserving students who participate in and contribute to the Youngstown State University athletic program.

The C. J. Strouss Memorial Scholarship. This scholarship of $150 is awarded annually to an upperclassman in memory of the late C. J. Strouss. The award was established in 1954.

The Grace M. and Blanche F. Vail Scholarship. This scholarship is available annually to a student of excellent character and scholarship who needs financial assistance. The stipend is the income from the Vail Scholarship Fund and was established in 1954.

The Sally Watson Scholarship. This scholarship was established in 1969 by friends of the late Sally Watson. Income from the fund provides a scholarship to a worthy student in any school or college of the University.

The Bessie Wilson Music Scholarship. The income from an endowment from the estate of Miss Bessie Wilson is used for scholarships awarded to music students. Applications may be sent to the Director of the Dana School of Music, who makes recommendations to the scholarship committee.

The Isadore Zobel Scholarship. This scholarship, established in 1966 under the will of Isadore Zobel, provides annual awards to needy students of Jewish faith.

EMPLOYMENT

Part-time jobs are available for students to help pay educational costs.

Students may obtain part-time employment both on campus and in Youngstown and surrounding communities. The University's Office of Student Financial Aids frequently can arrange for on-campus employment in such places as the cafeteria, residence hall, offices, library, and building and grounds maintenance. Off-campus employment may be arranged by the YSU Placement Service.

GRADUATE SCHOLARSHIPS

The Graduate School of Youngstown State University awards a number of assistantships each year. For information on these appointments, consult the *Graduate School Catalog* or the office of the Dean of the Graduate School.

YOUNGSTOWN EDUCATIONAL FOUNDATION. The Youngstown Educational Foundation has made funds available to the University to support a program of scholarship and grant-in-aid awards. For further information, consult the Graduate School Catalog or the office of the Dean of the Graduate School.

FULBRIGHT SCHOLARSHIPS. United States government scholarships for foreign study are available for graduate study abroad. Applications may be obtained from the Fulbright advisor, Dr. Leslie S. Domonkos, History.

DANFORTH GRADUATE FELLOWSHIPS. These are available to college seniors or recent graduates preparing to teach or do administrative work on the college level. Further information may be obtained from the campus representative, Dr. George E. Letchworth.

THE CECIL RHODES SCHOLARSHIPS. Male students of Youngstown State University are eligible to apply for these scholarships, which provide for study at Oxford University in England. Scholarships are awarded each year to students selected through personal interviews by a regional committee.

ADMISSION REQUIREMENTS

Youngstown State University admits as many qualified students as its facilities permit. All prospective students are required to submit an application for admission to the Admissions Office by the following closing dates:

QUARTER	CLOSING DATE FOR APPLICATION	CLASSES BEGIN
Fall 1978	August 11, 1978	September 25,1978
Winter 1979	November 17, 1979	January 2, 1979
Spring 1979	February 16, 1979	March 26, 1979
Summer 1979	May 11, 1979	June 18,1979

MEDICAL REPORT

Students who have been accepted for the first time are required to have a medical examination. A form supplied for this purpose is to be completed by a qualified physician and returned to the Admissions Office as soon as possible.

Application Fees

All applicants are required to pay an application or a readmission fee. These fees are not refundable under any circumstances. (See *Fees and Expenses* in this section.)

Student Resident Status

Residence for tuition purposes will be determined at the time of admission or readmission by the Director of Admissions on the basis of the Residency Rules shown below and information supplied on the "Application for Admission" form.

If there should be any doubt on the part of the student regarding the appropriate classification, it should immediately be brought to the attention of the Director of Admissions for a review. Retroactive refunds and charges may be made to any student improperly classified.

Resident Status Appeal

Appeal for a change in classification should be made in writing to the Director of Admissions, who may require the student to complete a form "Application for Non-resident Tuition Surcharge Exemption" from that office. The Director's written decision will be sent to the student, who may appeal the classification in a personal interview with the Director of Admissions.

The student may request the Director of Admissions to arrange an appearance before the Residence Classification Board. Appearances before the Residence Classification Board generally will be held within two weeks of the request, if possible. The Residence Classification Board is the formal appeal authority in such matters and its decision is final.

Residency Rules for Tuition Surcharge Purposes

The following persons shall be classified as residents of the State of Ohio for subsidy and tuition surcharge purposes:

1. Dependent students, at least one of whose parents or legal guardian has been a resident of the State of Ohio for all other legal purposes for twelve consecutive months or more immediately preceding the enrollment of such student in an institution of higher education.

2. Persons who have resided in Ohio for all other legal purposes for at least twelve consecutive months immediately preceding their enrollment in an institution of higher education and who are not receiving, and have not directly or indirectly received in the preceding twelve consecutive months, financial support from persons or entities who are not residents of Ohio for all other legal purposes.

3. Persons who are living and are gainfully employed on a full-time or part-time and self-sustaining basis in Ohio and who are pursuing a part-time program of instruction at an institution of higher education.

Specific Exceptions and Circumstances

1. A person on active duty status in the United States military service who is stationed and resides in Ohio and his or her dependents shall be considered residents of Ohio for these purposes.

2. A person who enters and currently remains upon active duty status in the United States military service while a resident of Ohio for all other legal purposes and his or her dependents shall be considered residents of Ohio for these purposes as long as Ohio remains the state of such person's domicile.

3. Any alien holding an immigration visa or classified as a political refugee, shall be considered a resident of the State of Ohio for state subsidy and tuition surcharge purposes in the same manner as any other student.

4. No person holding a student or other temporary visa shall be eligible for Ohio residency for these purposes.

5. A dependent person classified as a resi-

dent of Ohio for these purposes shall continue to be considered a resident during continuous full-time enrollment and until his or her completion of any one academic degree program.

6. In determining residency of a dependent student, removal of the student's parents or legal guardian from Ohio shall not, during a period of twelve months following such removal, constitute relinquishment of Ohio residency status otherwise established under paragraph (1) of the Residency Rules for Tuition Surcharge Purposes as stated above.

7. Any person once classified as a nonresident, upon the completion of twelve consecutive months of residency in Ohio for all other legal purposes, must apply to the institution he or she attends for reclassification as a resident of Ohio for these purposes if such person in fact wants to be reclassified as a resident. Should such person present clear and convincing proof that no part of his or her financial support is or in the preceding twelve consecutive months has been provided directly or indirectly by persons or entities who are not residents of Ohio for all other legal purposes, such person shall be reclassified as a resident. Evidentiary determinations under this rule shall be made by the institution which may require, among other things, the submission of information regarding the sources of a student's actual financial support to that end.

8. Any reclassification of a person who was once classified as a nonresident for these purposes shall have prospective application only from the date of such reclassification.

9. A person who is transferred by his or her employer beyond the territorial limits of the fifty states of the United States and the District of Columbia while a resident of Ohio for all other legal purposes and his or her dependents shall be considered residents of Ohio for these purposes as long as Ohio remains the state of such person's domicile.

10. A person who has been employed as a migrant worker in the state of Ohio and his or her dependents shall be considered a resident for these purposes provided such person has worked in Ohio at least four months during each of the three years preceding the proposed enrollment.

Procedures

Institutions of higher education charged with reporting student enrollment to the Ohio Board of Regents for state subsidy purposes and assessing the tuition surcharge shall provide individual students with a fair and adequate opportunity to present proof of their Ohio residency for purposes of this rule. Such institution may require the submission of affidavits and other documentary evidence which it may deem necessary to a full and complete determination under this rule.

NEW FRESHMAN APPLICANTS

To be admitted, applicants must have graduated from high school, or passed the test of General Education Development (GED). The open door policy of the University does not assure admission of an individual to a particular course or program. Developmental courses are available to assist in correcting scholastic deficiencies. Those who have not completed one or more of the pre-college courses required by the various schools or colleges within the University may be admitted with the understanding that these courses will be completed as soon as possible and not later than the end of the sophomore year.

Guidance and Counseling Tests

New freshmen (except those who have been out of high school for two or more years) are required to take either the American College Test (ACT)* or the Scholastic Aptitude Test (SAT) as soon as possible. Applicants who have been accepted and who are required to take a test must do so before registration is permitted. Failure to take a required test will result in postponing registration to a later quarter.

High School Transcripts

Applicants must arrange to have their highs schools send to the Admissions Office a record of all work completed. Partial transcripts will be given consideration for early decisions. If the applicant's record clearly indicates satisfactory completion, notification of acceptance will be made before high school graduation. Final transcripts on all early decision applicants must be received by the Admissions Office before registration will be permitted.

OHIO RESIDENTS

An Ohio resident must have graduated from high school, or passed the test of General Education Development (GED).

Out-of-State Residents

Residents outside the State of Ohio must be ranked in the upper two-thirds of their high

school class. Applicants who rank in the lower third of their class will not be admitted.

*The University is a testing center administering the ACT at announced dates to accommodate applicants to institutions requiring the test for entrance or advisement.

TRANSFER AND POSTGRADUATE APPLICANTS

An applicant who has been enrolled in another college or university and has been registered for at least one course, is classified as a transfer applicant. This classification includes postgraduate applicants from other institutions seeking additional undergraduate course work. Admission to the University does not assure admission to a particular course or program. Higher point averages as well as specific courses are required by a number of programs.

Transcripts

All transfer applicants are required to provide to the Youngstown State University Admissions Office a copy of their high school transcript and a copy of any and all undergraduate transcripts directly from the institutions attended. Postgraduate applicants are not required to submit high school transcripts unless specifically requested by the Admissions Office.

OHIO RESIDENTS

Applicants who are residents of Ohio and in good standing at the last institution attended with an accumulated point average of 2.0 or higher (on a 4.0 system) on all courses taken at other colleges or universities, are admitted in good standing. Those with less than a 2.0 or on probation may be considered for transfer or probation if their overall academic achievements, including high school grades and test scores, indicate potential success. Applicants suspended or dismissed from other institutions are not eligible for consideration until at least two (2) quarters following the term in which the suspension occured.

Out-of-State Residents

Applicants who are nonresidents of Ohio must be in good standing at the last institution attended and have at least a 2.0 accumulated point average (on a 4.0 system) to be considered for admission.

Transfer Credit

Transcripts of credits earned will be evaluated by the Admissions Office and a copy of the evaluation will be issued to the applicant upon acceptance.

Transfer credit will be given for all course work taken at a regionally accredited college or university provided that the student has an accumulative point average equivalent to at least a 2.0 (on a 4.0 system) at that institution and that the completed course work is creditable towards a degree at that institution. A student who has an accumulative point average of less than 2.0 (on a 4.0 system) at a regionally accredited college or university will transfer only those courses in which a grade of *C* or higher is earned. A *D* grade accepted in transfer of credit does not, thereby, satisfy a prerequisite for which a higher grade is needed.

Distribution of any accepted course work will be determined by the appropriate school or college and/or department in accordance with policies governing the fulfillment of degree requirements.

If the student wishes to receive a degree from Youngstown State University, the student will be required to complete at this University the last 45 quarter hours for a baccalaureate degree, and the last 30 quarter hours for an associate degree.

Applicants who attend any institution during a suspension period will not receive credit for work completed during the period of suspension (generally consisting of the two quarters immediately following the term of suspension).

Transfer from a Regionally Accredited Two-year Institution

The University recognizes the associate degree as preliminary to the baccalaureate and will admit to advanced standing students possessing the associate degree from an accredited institution. Transfer credit will be granted for all work successfully completed for the associate degree. If a student elects to pursue a baccalaureate program different from the associate degree program, additional courses may be required before achieving junior standing.

Applicants not completing an associate program are considered on the same basis as other transfer applicants.

TRANSIENT APPLICANTS

A student pursuing a degree at another institution may ordinarily take one quarter of

course work upon making application for admission to the University. In addition to the application for admission, the student must obtain from the Admissions Office, a Transient Authorization Form. This form must be partially completed by the applicant and the remainder by the registrar of the institution the student is attending. The form is to be returned by that registrar to the Admissions Office of Youngstown State University. Only students in good academic standing may be permitted to enter as transients.

Transient students who wish to remain at Youngstown State University for more than one quarter of course work must make such a request to the Admissions Office and must meet the same requirements and provide the same records required of transfer applicants.

FORMER STUDENT APPLICANTS

All students who have interrupted their attendance at Youngstown State University for one or more quarters, exclusive of summer, must make application for readmission.

Suspended Students—A former student who was academically suspended additionally is required to be reinstated by the dean of the school from which suspended, or, in the event the student wishes to change schools, by the dean of the school desired to enter. Reinstatement procedures may vary from school to school; for details consult either the Admissions Office or the appropriate dean's office.

GRADUATE APPLICANTS

Application for admission to the University for graduate study is made directly to the Dean of the Graduate School. (For details consult the Graduate School Catalog or the Office of the Dean of the Graduate School.)

INTERNATIONAL STUDENT APPLICANTS

Residents of foreign countries who wish to enter the University must apply at least six months in advance of the quarter they wish to attend. Upon request for an application the applicant will receive a booklet that provides detailed information including policies and procedures governing international students.

OFFICE OF CONTINUING EDUCATION AND PUBLIC SERVICE

Individuals interested in a continuing education program should consult with the director of that program.

VETERANS

Courses taken through the United States Armed Forces Institute (USAFI) or the Defense Activity for Non-Traditional Education Support (DANTES) as well as certain formal service school courses may be considered for transfer toward the student's degree program. United States Armed Forces Institute (USAFI) or Defense Activity for Non-Traditional Education Support courses must be evidenced by an official transcript and service school courses by certification of in-service training on DD Form 214 (Armed Forces of the United States Report of Transfer or Discharge).

Veterans who have completed at least one full year of active United States military service may receive up to six quarter hours of credit for the University's Health and Physical Education requirement. A copy of the applicant's DD Form 214 must be supplied to the Admissions Office in order to validate such credit.

CORRESPONDENCE COURSES

The University does not offer correspondence courses. The University will accept a limited amount of correspondence work taken in connection with an accredited college or university under the same circumstances as provided in the section titled *Transfer Credit.*

CREDIT BY EXAMINATION

Credit By Examination is available for students who are able to satisfactorily complete the appropriate subject examination. For further information contact the Admissions Office.

ADVANCED PLACEMENT FOR HIGH SCHOOL COURSES

The University recognizes work taken under the Advanced Placement program of the College Entrance Examination Board. A student who has satisfactorily completed an Advanced Placement program in high school and has taken the Advanced Placement test administered by the College Entrance Examination Board may receive college credit and/or placement, as the test results merit. A student receiving a score of three or higher may be granted from 4 to 12 quarter hours of credit for each test taken as determined by the individual department responsible for the respective test program.

GUIDANCE EXAMINATIONS

Prospective freshmen may take general intelligence and vocational interest examinations for guidance purposes. Those who wish

to do so should make arrangements with the University's Counseling Center.

GENERAL REQUIREMENTS FOR GRADUATION

Each student entering Youngstown State University is entitled to a copy of the University catalog. This catalog or any single subsequent catalog shall be the guide to graduation requirements for the student provided the student is in continuous attendance and does not change majors. When a student changes majors the catalog in effect at the time of change or any subsequent catalog shall be the guide to graduation requirements. Readmitted students shall use the catalog in effect upon their last readmission or any single subsequent catalog as the guide to graduation requirements. Any exceptions to requirements must be approved by the student's department chairman and/or the dean of the school from which the student expects to graduate. The University reserves the right to change course offerings and academic requirements. Certain general requirements apply to all degrees earned at Youngstown State while other requirements are specific to the degrees earned. There follows a condensed table of courses required for graduation including those high school or other preparatory units required.

CONDENSED TABLE OF COURSES REQUIRED FOR GRADUATION INCLUDING SPECIFIED PREPARATORY UNITS All graduates of accredited Ohio high schools are eligible for admission to Youngstown State University. If they lack pre-college units, these may be completed after admission to the University, as explained in the notes.

	A.B.*‡	B.S.*†	B.S. in Ed.*	B.S. in A.S.*	B.S. in B.A.*	B.E.*	B.F.A.*	Mus. B.*	A.A.* A.A.B.* A.A.S.*
PRE-COLLEGE[1]			(These figures mean high school units)						
English	3	3	3	3	3	3	3	3	3
A foreign language[2]	2	2[3]	—	—	—	—	—	—	—
U.S. history and civics	1	1	1	1	1	1	1	1	1
Algebra[4]	1—2[5]	1—2[5]	—	1	2	2[5]	—	—	1[10]
Geometry[4]	1	1	—	1	1	1	—	—	1[10]
Biology, chemistry, or physics[4]	1	1	—	1	—	1[6]	—	—	—
Any mathematics[4]	—	—	1	—	—	—	1	1	—
Any science or additional mathematics[4]	—	—	1	—	1	—	—	—	1[10]
Any Science[4]	—	—	—	—	—	—	1	1	—
Total of above units	9 or 10	9 or 10	6	7	8	8	6	6	7
Other subjects[7]	6 or 7	6 or 7	10	9[8]	8	8[8]	10	10[9]	9[8]
Total high school units	16	16	16	16	16	16	16	16	16
IN THE UNIVERSITY	GENERAL								
Basic				(These figures mean quarter hours of credit)					
English Composition	8	8	8	8	8	8	8	8	4—8
Health and physical education	6	6	6	6	6	6	6	6	3B
Speech			4						
Area									
Humanities	16	16	8—18[11]	8—18	8	8	8—18	8—18	—‡
Social Studies	20	20	16—22[12]	16—22	20	16	16—22	16—22	9
Science/mathematics	16	Included in the major	12—22[14]	12—22	13	46	12—22	12—22	5‡
For the Degree[13]									
Foreign language[15]	8	4	—	—	—	—	—	—[16]	—
Other courses[17]	112 or 100	138 or 126	128	126—138	131—138	114	136	132—159	—‡
Total credit hours[18]	186	186	186—202	186—198	186—194	198	186—212	189—209	96[19]‡

NOTES

*The full names of the degrees are as follows: A.B., Bachelor of Arts; B.S., Bachelor of Science; B.S. in Ed., Bachelor of Science in Education; B.S. in A.S., Bachelor of Science in Applied Science; B.S. in B.A., Bachelor of Science in Business Administration; B.E., Bachelor of Engineering; B.F.A., Bachelor of Fine Arts; Mus.B., Bachelor of Music; A.A., Associate in Arts; A.A.B., Associate in Applied Business; A.A.S., Associate in Applied Science.

†For students whose mathematics requirement is Mathematics 531, Mathematics of Business, the high school requirement is one unit of algebra. For students whose mathematics requirements are Mathematics 542, Special Topics of Algebra, and Mathematics 550, Introduction to Calculus, the high school requirements are two units of algebra and one unit of geometry.

†H. & P.E. 590. For Nursing students, H. & P.E. 590 is waived.

‡See curriculums in the College of Applied Science and Technology section.

[1]Pre-college units lacking at the time of entering the University are to be made up before the beginning of the junior year.

[2]An entrant lacking these units may make up the deficiency by taking a first-year foreign language course without University course-credit, or by any other means acceptable to the Committee on Proficiency in a Foreign Language.

[3]Foreign language study is not required for the Bachelor of Science degree if the student completes the combined major in medical technology.

[4]An entrant who lacks one or more of these units may make up the deficiency by taking the relevant high school-level course offered by the Mathematics Department or appropriate science department without University course-credit, or may make it up in any other way acceptable to the department concerned. For those whose requirement is one year of algebra, a second year of algebra may be substituted for a year of geometry.

[5]One unit is enough except for a major in chemistry, earth science, engineering, mathematics, or physics, for a major in premedical or allied sciences, or for a minor in mathematics or physics. Many of these fields require Mathematics 571, the prerequisite for which is two units of high school algebra, a unit of geometry, and a half-unit of trigonometry.

[6]For the Bachelor of Engineering degree one unit of physics is required.

[7]It is suggested that these unspecified units include additional courses in history, foreign languages, English, laboratory sciences, and mathematics, since many specialized University curriculums leave little or no time for some of them, especially history, literature, and foreign languages.

[8]A unit of mechanical drawing and a half-unit of trigonometry or solid geometry, or both, are particularly advisable for Engineering and Engineering Technology students.

[9]In addition to these units the applicant is expected to have developed a certain proficiency in one or more branches of applied music. See the Dana School of Music section.

[10]Students in the two-year secretarial program need only one unit of math and may substitute general or business math. The preferred sciences for dental hygiene technology, medical assisting, and nursing students are biology and chemistry.

[11]At least one course in each of two areas of fine arts, philosophy and/or theological studies is required by the State Department of Education for students seeking a high school teaching certificate.

[12]Candidates for the B.S. in Ed. who seek certification in elementary education or special education (EMR or LD/BD) are required to take 27 quarter hours of social studies.

[13]Requirements peculiar to a particular degree are explained more fully in the section of this catalog primarily concerned with that degree.

[14]Candidates for the B.S. in Ed. in elementary education are required to take 12 hours of science (physical and biological) plus nine hours of mathematics: this is the minimum set by the State Department of Education. Students seeking a high school teaching certificate must have at least one course in mathematics to meet the minimum set by the State Department of Education. Candidates for the B.S. in B.A. take Mathematics 542 as specified by the various curriculums.

[15]The eight-hour requirement for the A.B. and four-hour for the B.S. assumes the continued study of the same language in which two units of high school credit were earned. If a different language is studied, or if more than two units of high school credit is earned, the requirement is different. See *Proficiency in a Foreign Language* for details.

[16]For voice majors 24 hours are required. Part of this requirement may be met by two units of high school study in one of the following languages: French, Italian, or German. In this case 16 hours are required (eight hours in each of the two languages not previously studied).

[17]These include all courses necessary for the major, minor or minors, teaching certification (if needed), and for any other special purposes. For many fields, all the courses required or suggested are listed in the form of year-by-year curriculums in the pertinent sections of this catalog.

[18]For the B.S. in B.A., this total is a few hours higher in some fields of specialization; for example, accounting, finance, industrial management, public administration, general administration, commercial art, and transportation management total 194 each. The B.S. with a major in nursing requires 194 hours. For the Mus.B., the total varies from 201 in applied piano to 212 in music education. For the B.S. in Ed.,

the minimum is 186 quarter hours if the student is exempted from taking Education 502.

[19]The exact number of hours varies for the various two-year programs as shown in the specific curriculums.

CANDIDACY FOR A DEGREE

For any *degree*, the following three requirements must be fulfilled:

Application. A formal application for graduation must be filed at the Bursar's Office before 5:00 p.m. on the Monday following the first complete week of the quarter in which the student intends to graduate. This form may be secured in the office of the dean of the appropriate school or the office of the Registrar. If the student does not graduate at the commencement exercise for which the formal application has been filed, the application must be reactivated. The student should file the "Intention to Graduate" form with the dean of the school after the completion of 60 quarter hours for an associate degree and 150 quarter hours for a baccalaureate degree. (See *Fees and Expenses* further on in this section.)

Residence. The last 30 quarter hours leading to an associate degree and the last 45 quarter hours leading to a baccalaureate degree must be completed at Youngstown State University. (In the pre-forestry, pre-law, and pre-medical curriculums, however, which allow the student to earn final credit hours *in absentia*, the last 45 quarter hours prior to the transfer must be spent at Youngstown State University.) Any modification of this requirement must be approved by the Vice President for Academic Affairs, or his designate.

Grades. The point index must be not less than 2.00 *(see The Point Index and Scholastic Standing,* further on in this section) at the time candidacy is approved and at the time the degree is granted.

For additional requirements specific to the associate or bachelor's degree, further details follow.

COMMENCEMENT

There are three graduation ceremonies each year: Winter Commencement, in March, at the end of the second quarter of the academic year, Spring Commencement, in June, at the end of the third quarter of the academic year, and Summer Commencement, at the end of the summer session. A student who completes the requirements for a degree at the end of the fall quarter and who has applied for candidacy for December graduation may be certified as having completed all degree requirements although the diploma is not received until March. Both the diploma and the academic record will bear the date of the March commencement.

GRADUATION HONORS

Graduating seniors who rank high scholastically are awarded special honors at the commencement exercise.

Those who attain a quality point average of 3.8 are granted their degrees *summa cum laude.*

Those who attain a point average of 3.6 are granted their degrees *magna cum laude.*

Those who attain a point average of 3.4 are granted their degrees *cum laude.*

Graduating students for any associate degree who rank high scholastically are awarded special honors at the commencement exercise.

Those who attain a quality point average of 3.7 are granted their degree with high honors.

Those who attain a quality point average of 3.4 are granted their degree with honors.

Transfer students who are baccalaureate degree candidates with at least 90 quarter hours of credit at Youngstown State University or who are associate degree candidates with at least 60 quarter hours of credit at Youngstown State University are eligible for graduation honors. However, no transfer work—work taken at any time at an institution other than Youngstown State University—may be included in the calculation of the point average. No transfer student admitted to the University on probation is eligible for honors.

BACCALAUREATE DEGREE

In addition to requirements indicated under *Candidacy for a Degree,* the following requirements must also be fulfilled for a baccalaureate degree. Any deficiency in high school units for the desired degree must have been made up. This is the student's responsibility. The preparatory units are not the same for all degrees; they are listed in the *Condensed Table of Courses Required for Graduation* and should be read carefully, together with the explanatory notes accompanying them. This is especially important if the student changes the degree for which the student is studying, as high school preparation, even though satisfactory for the original objective, may not be satisfactory for the new

one. *The fact that a student has been admitted to the University to study for one degree does not mean that the student is equally qualified to become a candidate for every other degree the University offers.*

Course Levels. At least 90 quarter hours must be completed in courses numbered 600 or higher; at least 60 of these 90 hours must be in courses numbered 700 or higher.

Majors and Minors. Each student must complete a major. In addition, each student must complete a minor, unless the student: (1) elects to complete a combined major, or (2) enrolls in a school/college offering approved professional or technical curricula which do not require a delineated minor.

A departmental major consists of at least 45 quarter hours in one department with grades of "C" or better. A combined major, in which courses are offered by more than one department, consists of at least 70 quarter hours with grades of "C" or better. A minor consists of at least 21 quarter hours with grades of "C" or better in a department other than that of the major, unless the department includes more than one discipline. Certain approved inter-disciplinary programs are exceptions to the above definitions.

Each department specifies the course requirements for the major. If the department chooses, it may also establish a pattern of courses to be recommended for students seeking a minor in the department's academic discipline. However, responsibility for certifying that a student has completed his/her major and minor rests with the chairperson of the department in which the student seeks a major. The student may be required to do more than the minimum stated in the preceding paragraph.

As soon as a student has decided on the major, he/she should consult with the chairperson of the major department. While no student is compelled to declare a major before completing an "Intention to Graduate" form, early consultation with the chairperson is strongly recommended. In some departments, the student must begin course work related to the major during the freshman year or risk a delay in graduation.

Credit from Professional Schools

A student who has completed work at Youngstown State University for a bachelor's degree and has satisfied all requirements for this degree before leaving the University, except the completion of not more than 45 quarter hours, will be granted the appropriate bachelor's degree on the satisfactory completion of the remaining hours in any professional school granting the degree of Doctor of Dental Surgery or equivalent; Doctor of Medicine, Doctor of Osteopathy, Doctor of Veterinary Medicine or equivalent; Doctor of Jurisprudence or equivalent; Doctor of Ministry or equivalent; Bachelor of Divinity or equivalent, and approved by the accrediting agency of that profession, provided that the student has been accepted for further study at the professional school. The student may thus secure the bachelor's degree after three to three-and-a-half years in the University followed by approximately a year in the professional school.

GENERAL COURSE REQUIREMENTS

Basic

The following *basic* requirements are ordinarily met through particular courses designed and specified for them. They apply to all degrees.

English. The candidate must show satisfactory proficiency in the use and understanding of the English language. The chairman of the Department of English is the judge of this proficiency. Ordinarily if a student has received a grade of *C* or better in the final quarter of the required course in English, the student will be considered to have achieved this proficiency.

This requirement is normally met by taking English 550, 551, totaling eight quarter hours. Information on policy and procedure for exemption from all or part of the freshman English requirement is available from the English office. A student who has had part or all of some other "freshman English" course, either at this institution or elsewhere, should consult the chairman of the Department of English before registering at Youngstown State University.

Health and Physical Education. Each candidate must normally have six quarter hours of credit in health and physical education. Usually this consists of three hours of health education, (Health and Physical Education 590) and three one-quarter-hour physical activity courses. The candidate who completes the two-year course in military science needs only three quarter hours of Health and Physical Education 590 (See *Modifications for R.O.T.C. Students*, further on in this section). Other substitutions of courses or of training received in active mili-

tary service to meet any part of this requirement must have the approval of the chairman of the Department of Health and Physical Education in conformity with guidelines established by the faculty and normally administered by the Director of Admissions.

*For this purpose, the School of Education and the Dana School of Music are departments, and each foreign language is a department.

GENERAL COURSE REQUIREMENTS

Area

The candidate must complete at least 46 quarter hours in total in the general areas of humanities, social studies, and science/mathematics. The following are the general requirements in particular areas of study:

Humanities. The candidate must have completed at least eight quarter hours and may apply no more than 18 quarter hours in satisfaction of the requirement in any of the following: Literature courses in English or humanities (600-level or above); courses in a literature in a foreign language; course work in the Department of Philosophy and Religious Studies; or history and/or appreciation courses in the Department of Art, of Speech, Communication and Theatre, or of the Dana School of Music. *Introduction to Black Studies II* is also applicable to this requirement. Candidates for Ohio high school teaching certificates must have at least one course in each of two areas of fine arts, philosophy and/or theological studies.

Social Studies. The candidate must have completed at least 16 quarter hours and may apply no more than 22 quarter hours in satisfaction of the requirement in at least two of the following departments: Economics, Geography, History, Political Science (including the Social Science sequence courses), Psychology and Sociology. *Introduction to Black Studies I* is also applicable to this requirement. Elementary education majors must take additional course work as specified in the School of Education section.

Science/Mathematics. The minimum requirement in this area for all baccalaureate degrees is 12 quarter hours. No more than 22 quarter hours may be applied in satisfaction of the requirement. At least eight quarter hours of science must be taken. No more than 10 quarter hours of mathematics may be applied toward the requirement. The science area includes courses in the departments of Biological Sciences, Chemistry, Geology, Geography (physical), and Physics and Astronomy.

Candidates for the B.S. in Ed. must meet the following State Department of Education requirements:

In elementary education, 12 quarter hours of science (physical and biological) plus nine quarter hours of mathematics (Mathematics 515 and Mathematics 516).

Students seeking a high school teaching certificate must have at least one mathematics course in the 16-quarter-hour science/mathematics requirement.

ADDITIONAL REQUIREMENTS FOR EACH DEGREE

A degree requirement is one which applies to all (or, in a few cases, to most) of the students seeking a particular degree, but is not necessarily a requirement for other degrees. Degree requirements will be found as follows:

Those for the degrees of Bachelor of Arts (A.B.) and Bachelor of Science (B.S.) are stated in the College of Arts and Sciences section.

Those for the degree of Bachelor of Fine Arts (B.F.A.) are listed in the College of Fine and Performing Arts section.

Those for the degree of Bachelor of Science in Applied Science (B.S. in A.S.) are in the College of Applied Science and Technology section.

Those for the Bachelor of Science in Education (B.S. in Ed.) degree are stated in the School of Education section.

Those for the degree of Bachelor of Science in Business Administration (B.S. in B.A.) are in the School of Business Administration section.

Those for the degree of Bachelor of Engineering (B.E.) are in the William Rayen School of Engineering section.

Those for the degree of Bachelor of Music (Mus.B.) are in the Dana School of Music section.

Those for the degree of Bachelor of Fine Arts (B.F.A.) and for the degree of Bachelor of Music (Mus.B.) are listed in the College of Fine and Performing Arts section.

ASSOCIATE DEGREE REQUIREMENTS

For an associate degree, the requirements of a two-year curriculum of the College of Applied Science and Technology must be fulfilled.

For these requirements, see the curriculums in the College of Applied Science and Technology section.

MODIFICATIONS FOR ROTC STUDENTS

R.O.T.C. students may have certain requirements modified with approval of their academic major advisor:

a. Students taking leadership laboratory concurrently with all of the following courses: MS 501, MS 502, MS 503, MS 601R, MS 602R, and MS 603, may omit three quarter hours in Health and Physical Education *ACTIVITY* courses.

b. The following courses are identified as possible substitution for Social Studies requirements in consultation with the academic major advisor:

	Q.H.
MS 503 US Army and National Security	1
MS 601R American Military History	3
MS 702R Leadership	2
MS 803 Human Relations, World Changes and Military Implications	3

c. The following course is identified as possible substitution for a science requirement in consultation with the academic major advisor:

MS 602R Map Reading and Land Navigation	3

d. The following courses may be substituted as general electives in consultation with the academic major advisor:

MS 501 Military in Society	1
MS 502 Technological Development	1
MS 603 Basic Military Operations & Tactics	1
MS 604 Basic ROTC Summer Camp (2-yr. students only)	4*
MS 701 Teaching Principles	2
MS 703R Small Unit Tactics and Communications	2
MS 704 Advanced ROTC Summer Camp	3
MS 801 The Military Team	2
MS 802 Army Management	2

e. Academic major advisors may allow substitution credit as indicated:

1. COLLEGE OF ARTS AND SCIENCES
   - 3 ACTIVITY hours for Health and Physical Education
   - 9 q.h. Social Studies
   - 3 q.h. Science
   - 14 q.h. General Electives

   A minor is available in consultation with the academic major advisor.
2. SCHOOL OF BUSINESS ADMINISTRATION
   - 3 ACTIVITY hours for Health and Physical Education
   - 9 q.h. Social Studies
   - 3 q.h. Science
3. SCHOOL OF EDUCATION
   - 3 ACTIVITY hours for Health and Physical Education
   - 9 q.h. Social Studies
   - 3 q.h. Science
4. SCHOOL OF ENGINEERING
   - 3 ACTIVITY hours for Health and Physical Education
   - 3 q.h. for MS 601R History
5. COLLEGE OF FINE AND PERFORMING ARTS
   - 3 ACTIVITY hours for Health and Physical Education
   - 7 q.h. Social Studies
   - 6 q.h. General Electives
6. COLLEGE OF APPLIED SCIENCE AND TECHNOLOGY (4-yr.)
   - 3 ACTIVITY hours for Health and Physical Education
   - 9 q.h. Social Studies
   - 3 q.h. Science
   - 14 q.h. General Electives

   A minor is available in consultation with the academic major advisor.

*Credit for two-year program students not completing MS 500 and MS 600 level courses only.

REQUIREMENTS FOR A SECOND DEGREE

A student who has a degree from Youngstown State University and desires a second degree must earn 27 quarter hours of credit in addition to the total compiled when the requirements for the first degree were completed, meet all requirements for the second degree, and complete the requirements for another major. In no case may a student be awarded the same degree twice, although the student may earn a second major in a given degree subsequent to the time the degree was originally awarded.

A student who had a degree from another institution and desires a degree from Youngstown State University must complete a minimum of 30 quarter hours for an associate degree and 45 quarter hours for a bacca-

laureate degree, meet all requirements for the second degree, and complete the requirements for a new major and minor.

CURRICULUMS TO MEET SPECIAL REQUIREMENTS

All states have detailed programs of courses necessary for teaching certificates; medical schools have specific requirements for pre-medical study; and many law, theological, technological, and graduate schools have more or less mandatory recommendations for those seeking admission. A prospective teacher, therefore, or anyone wishing to enter a professional, technological, or graduate school of any kind should consult the dean of the appropriate undergraduate school of this University as early as possible. Such special needs can usually be met within the degree requirements of Youngstown State University, but the proper selection of courses may have to begin in the freshman year.

INDIVIDUALIZED CURRICULUM PROGRAM

The student whose needs are not completely met by existing conventional programs may wish to investigate and apply for the Individualized Curriculum Program. This allows a student to design the curriculum suited to the student's particular background and needs, allowing alternative paths for reaching the currently offered undergraduate degrees.

A student admitted to the program will have the help of a committee of faculty advisors of the student's selection. This committee will help to develop a program that will serve a valid educational goal not attainable within the regular curricular structure of the University. The overall program needs to be of a scope and intensity comparable to conventional programs leading to the degree being sought in order to receive approval.

Waiver of any existing curricular requirement may be sought subject to approval by the student's committee and the appropriate academic dean. However, the student must present valid specific reasons for each variation from these requirements. Only curricular adjustments may be made within this program; it does not provide for new or modified courses or degrees, or to changes in course prerequisites. Credit by examination may be sought, subject to approval through normal channels.

Detailed information is available from the director of the program, Room 215, College of Arts and Sciences Office Building.

GENERAL REGULATIONS

STUDENT RECORDS POLICY

The Student Records Policy is published in the *Youngstown State University Code of Student Rights, Responsibilities, and Conduct* which is available in the Office of the Dean of Student Affairs.

ORIENTATION

An orientation designed to assist new and transfer students in becoming acquainted with Youngstown State University and its student services is conducted prior to the beginning of classes.

ADVISEMENT

The Registrar's Office will mail instructions for advisement and registration prior to registration. The policy regarding advisement and the advisor's signature is:

> All students are urged to consult with advisors in their major area. Each department or school has a procedure for either assigning an advisor to a student or for a student to select his/her advisor. Signatures on advisement sheets are required for *all freshmen* (up to 48 hours credit completed as indicated on the permit to register), first quarter transfer students, former students returning to the University, and all students whose grade point average is below 2.00 (as indicated on the permit to register). The responsibility for fulfilling all requirements rests ultimately upon the students; the advisors will assist them in that process.

A student planning the program should use the *Schedule of Classes* in order to determine the specific classes offered in a particular quarter. The *Schedule of Classes* is published for each quarter by the Registrar's Office. For information about future offerings, or when a particular course will be offered again, the student should consult the appropriate department chairman.

REGISTRATION

Every student registers in person, by appointment from the Registrar's Office, for each quarter, as follows:

1. Current students register according to the registration appointment schedule published in the *Schedule of Classes.*
2. New, transfer, and former students register according to appointments

mailed to them by the Registrar's Office.

Registration must be concluded no later than the date published for Late and Final Registration for the particular quarter. All significant dates are published in the Catalog Issue of the Youngstown State University Bulletin and in the *Schedule of Classes* for each specific quarter. Registration is not officially completed until all tuition and fees are paid by the applicable deadline date.

EXTRA HOUR CREDIT

Credit for more than the stated hours may be obtained for extra work done in a course under the following restrictions:

1. Permission is limited to seniors.

2. Extra credit may not exceed one hour per quarter.

3. A brief description of the extra work must be given by the instructor.

4. Such extra work is done only under the supervision of a full-time instructor.

5. An application form must include signatures showing approval of the instructor of the course, the chairman of the department in which it is being taught, and the dean of the school in which the course is taught.

MINIMUM CREDIT HOUR

Registration is not permitted for less than the approved credit hour value of any course.

VARIABLE CREDIT HOURS

Certain courses have variable credit hours. A student wishing to register for such a course may do so only after consulting with the department offering the course to determine the number of hours available.

CLOSED CLASSES

During the registration period or the period for adding classes, many classes become filled. These classes are called "closed," which means that no more students will be admitted to them. Only the chairman of the department can admit a student to a closed class or reopen a closed class.

CHANGE OF REGISTRATION

A registered student wishing to alter a schedule must complete a Change of Registration form. After all the forms have been properly completed, including the Registration Scan Sheet, they must be submitted to the Registrar's Office. All necessary fees must be paid before the change is processed.

A registered student may enter an additional course through the Change of Registration procedure until the seventh calendar day of the quarter or until the fifth calendar day of a summer term.

Withdrawal from a course must be accomplished through the Change of Registration procedure. If a student withdraws from one or more classes during the first week of classes, no entry will be made on that student's permanent record for the class(es) from which he/she withdraws. If a student completely withdraws during the first week of classes, the permanent record will contain the message, "Student completely withdrew during the first week of the quarter."

A grade of F will be recorded unless a student officially withdraws in the above manner.

CANCELLATION OF REGISTRATION

Registration is not complete until tuition and fees have been paid. Tuition and fees not paid by the due date will result in schedule cancellation. Any student whose schedule has been cancelled due to nonpayment of tuition and fees must apply for readmission to attend a subsequent quarter.

COMPLETE WITHDRAWAL

The student who wishes to withdraw from all classes in a particular quarter must follow the same procedure as in Change of Registration. The student will automatically receive a Permit to Register for the subsequent quarter.

AUDIT

A student may register for and attend any courses on an audit basis. The student is not held responsible for the regular class work, class attendance, or preparation of assignments, and receives no credit for the course. The student pays the regular tuition, as well as any other applicable fees, for the audit course. Audited courses are carried in a student's load only for fee purposes. A student who has registered for a course for audit may not change that status to credit after the last day to add a class. A student who has registered for a course for credit may not change that status to audit after the last day to drop a course with a grade of *W*.

CONFERENCE COURSES

Conference work is available only in exceptional cases and if the academic advisor considers conference work essential. Conference courses have the following restrictions:

1. Permission limited to seniors with a 3.00 average. Exceptions must be approved by the dean of the school in which the student is enrolled.
2. Must be given by a full-time faculty member.
3. Brief description of the conference course must be given by the full-time faculty member.
4. Must have approval from the department concerned and the dean of the school in which the course is offered.

CREDIT/NO CREDIT

A student may elect to register for a course on a *CR/NC* basis. (See *CR/NC* under Grading System below.)

CREDIT BY EXAMINATION—DEPARTMENTAL

A student who can demonstrate ability and knowledge in a particular subject area may establish credit in certain courses without enrolling in them. This is done by taking a special examination through the appropriate department. An examination fee of $15.00 is assessed for each examination. No letter grade, only *CR*, is given for credit by examination. This does not affect the student's grade point average. Information on courses available for credit by examination may be obtained from the student's academic dean, the Admissions Office, or the Registrars Office.

GRADUATE COURSES FOR UNDERGRADUATES

An undergraduate student who has senior standing and a cumulative grade point average of 2.7 or above, and who does not require a full schedule to complete the baccalaureate degree requirements at Youngstown State University, may enroll in 900-level and 1000-level courses for graduate credit provided such enrollment does not cause the total schedule for the quarter to exceed 16 quarter hours. Before registering for the courses, the student must have the approval of the advisor, the instructor of each course in which the student wishes to enroll and the Dean of the Graduate School. The credit earned cannot be counted toward fulfillment of the requirements for a baccalaureate degree, and may not be used for graduate credit at Youngstown State University until the student is admitted to the Graduate School and the credit is accepted by the department in which the student continues graduate work. The amount of such credit that will be acceptable at Youngstown State University is 15 quarter hours.

Permission to undergraduates to enroll in graduate courses for undergraduate credit will be granted only to students with proven exceptional academic ability; such permission will be based on a petition prepared by the student's major department containing a statement of criteria used to determine "exceptional" and approved by the department offering the course and the Dean of the Graduate School.

REPETITION OF COURSES

A student may repeat a course once, unless otherwise specified in the course description or unless an additional repetition is authorized by the student's academic dean. If the course is a prerequisite to another course, the repetition must be successfully completed before the other course is taken. A course may not be repeated if the student has received credit for a more advanced course in the same subject. If a course is repeated, the repetition is treated merely as another course, along with the first, in calculating the point index unless the student secures an approved Petition for Recalculation of Point Average from the dean of the school in which enrolled. (See *Recalculation of Point Average* in the following section.) A course repeated, however, may be counted only once as credit toward a student's total academic hours for graduation.

RECALCULATION OF POINT AVERAGE

When a current undergraduate student repeats a course, the student may petition the dean of the school for a recalculation of the grade point average reflecting that repetition. Although courses are not deleted from the permanent record, the record is adjusted to reflect the inclusion of only the higher grade in the computation of the point average. The hours credited toward degree hours completed are those earned with the higher grades. Only undergraduate students currently enrolled in the University may request this recalculation privilege. A post-baccalaureate student is not eligible to petition for a recalculation unless both the course and the repetition are completed subsequent to the conferring of the degree. A student holding the two-year associate degree may petition after receiving the associate degree only if currently pursuing a baccalaureate degree.

ACADEMIC HONESTY

The qualities of intellectual and spiritual maturity necessary to graduates who are to prove socially valuable in their communities cannot be reconciled with academic dishonesty. To maintain high scholastic standards and to ensure each student the right to an honorable and rewarding education, the University attempts to discourage academic dishonesty, *e.g.*, cheating and plagiarism.

Though instructors are responsible for taking all reasonable precautions to prevent cheating and plagiarizing, students share a joint responsibility for maintaining honorable conditions and should report any dishonorable conduct to the instructor.

An instructor may give a failing grade to any student who cheats in a class. The failing grade may be either for the test or paper on which the cheating or plagiarism occurred, or for the entire course. The circumstances of the incident should be discussed with the student prior to giving the failing grade. A report of such action will be filed with the Office of the Dean of Student Affairs for consideration in the event that similar acts of dishonesty should occur at some future time.

In that such grades are in fact disciplinary actions, the student involved may appeal the action to a disciplinary Hearing Panel by contacting the Dean of Student Affairs. In the event of an appeal, both the student and the instructor will be invited to appear before the Panel.

Repeated incidents of academic dishonesty or single, flagrant offenses may warrant action beyond a failing grade in the course. These cases will be referred to the Office of the Dean of Student Affairs for consideration by disciplinary Hearing Panels.

Offenses which may warrant additional sanctions, *e.g.*, disciplinary probation, suspension, or expulsion, include the following:

a. Cheating, plagiarism, or other forms of academic dishonesty, including the acquisition, without permission, of tests or other academic material belonging to a member of the University faculty or staff.

A student enrolled at Youngstown State University who secures the services of an enterprise engaged in the selling of term papers or other academic materials, and who submits these as the student's own work to an instructor, is commiting plagiarism.

b. Furnishing false information to the University with intent to deceive.

c. Forgery, alteration, or misuse of University documents, records, or identification cards.

A student who is found guilty of a forgery is reminded that under the new Ohio Revised Code, forgery is classified as a felony and is punishable as such.

d. Unauthorized possession or use of property of the University or property of a member of the University community or property of a campus visitor.

Procedures for reporting, investigating, and considering violations of the Code of Student Rights, Responsibilities, and Conduct are found in Article VI, Due Process and Disciplinary Procedures, of the Code.

The complete Code, as well as most other policies and regulations of the University, is published in the Student Handbook. Further information may be obtained from the Dean of Student Affairs.

ABSENCE FROM CLASSES AND EXAMINATIONS

The problem of excessive class absence concerns instructor and student, and consequently requires their mutual effort in solution. The student must realize that for his/her own welfare he/she is expected to attend all class meetings of a course in which he/she is enrolled.

The instructor, however, has the prerogative of determining the relationship between class attendance, achievement, and course grades, and the responsibility for communicating that relationship to the students at the beginning of each quarter.

A student must have the instructor's consent in order to take any examination at a time other than that scheduled. The dean, if consent is given, may waive the fee for irregular examination if such action seems warranted. If the test is to be taken at the Testing Office, the student must present to the Testing Office a letter of permission from the dean concerned which also indicates whether or not the above-mentioned fee is to be charged.

THE CLASS HOUR, QUARTER HOUR, AND QUARTER HOUR OF CREDIT

The *class hour** is a weekly 50-minute class period and is the basic unit of instruction. The term *quarter hour** signifies one

class hour a week carried for one 11-week quarter (or the equivalent in a summer term). A *quarter hour of credit** is the amount of credit given for one quarter hour successfully completed. Each quarter hour of credit represents *three hours of study and instruction* every week through the quarter.

*Often called simply "credit hour," the expression sometimes means "quarter hour of credit" and sometimes merely "quarter hour."

THE TIME/CREDIT RATIO

As seen above, credit is based on a time/credit ratio of *three* hours a week of study and instruction to *one* quarter hour of credit. Of these three hours, the class hour is one; the other two are the time spent by the student in preparing for the class hour, or in supplementing it. In other words, *for every class hour, two additional hours are expected to be spent outside of class* in reading, writing, thinking, solving problems, laboratory activity, or whatever the course calls for. The exact amount may vary from day to day, depending on the particular assignment, the individual student, and other factors; but assignments are normally made on this one-plus-two principle, and the student is responsible for completing them.

For example, a so-called "three-hour" course actually involves nine hours a week, consisting of at least 150 minutes of class sessions (that is, three class hours†) and six hours of study done out of class. If the course involves laboratory periods, these form a part of the weekly total of nine hours.

Accordingly, the student carrying a 16-hour schedule, for example, should count on devoting an average of 48 hours a week (exclusive of time spent in extracurricular activities, commuting, eating, etc.) to it. Some students may find that more than 48 hours is necessary. These facts should be kept in mind especially by students planning to hold jobs while attending the University.

†In a three-hour course the class hours may take the form of three 50-minute sessions weekly, or two 80-minute sessions weekly, or (as in some laboratory courses) one or two 50-minute class sessions and one or more laboratory periods weekly which include instruction, or any other practical form.

THE STUDENT LOAD

The quarter hours of credit a student carries per quarter depend on the degree sought and on the curriculum being followed. Students interested in taking more than the recommended load under their curriculum should consult their academic advisor.

FULL-TIME STATUS

A full-time student is one carrying 12 or more hours for credit.

ACADEMIC CLASSIFICATION

All students working for any undergraduate degree conferred by this University are ranked in classes, by quarter hours completed, as follows:

Freshman..... 0-47 quarter hours credit
Sophomore..... 48-95 quarter hours credit
Junior..... 96-143 quarter hours credit
Senior.....144 or more quarter hours credit

For purposes of satisfying course prerequisites, the term "senior standing" is defined by reference to the specified curriculums of a given school or college in those schools and colleges which provide detailed programs leading to the attainment of a degree.

COURSE NUMBERING SYSTEM AND ABBREVIATIONS

It is important that the student be familiar with the University's course-numbering system and its significance, and with the abbreviations used to indicate the amount of credit.

Hyphen. A hyphen between numbers (*e.g.*, 501-502-503) indicates that credit is not given toward graduation for the work of the first and second quarter until the work of the third quarter is completed, except when special permission is granted by the chairman of the department in which the course is given. *The first quarter of such a course is prerequisite to the second and the second quarter prerequisite to the third.*

Comma. Ordinarily, a comma between numbers (*e.g.*, 501, 502, 503) indicates that the course extends throughout the year, but that credit toward graduation is given for one or two quarters. If one quarter of such a course is prerequisite to another, it is so designated.

ABBREVIATIONS AND REFERENCE MARKS

The abbreviation of "q.h." at the end of a course description stands for "quarter hours of credit." Thus, credit for a three-quarter-course is indicated by the notation 3+3+3 *q.h.* meaning "three quarter hours of credit each quarter."

The abbreviation *n.c.* means "no credit." Thus, 2 *n.c.* indicates that the course offers

no quarter hours of credit but that the course is regarded as two hours for load and billing purposes.

"Prereq." stands for "prerequisite." Though the prerequisite for a course is usually listed in the course description, it may be given in the general information at the beginning of each departmental section.

An asterisk or other reference mark used in a curriculum ordinarily refers to a note immediately following that curriculum. Occasionally, however, such a note may be at the foot of the page.

The abbreviation F, W, Sp, and Su in a course description stand for fall, winter, spring, and summer, and indicate the quarter or quarters in which the course is offered.

The abbreviation NOUCOM stands for Northeastern Ohio Universities College of Medicine.

UPPER AND LOWER DIVISIONS

Courses numbered from 500 to 599 are designed for the freshman level; from 600 to 699, the sophomore; from 700 to 799, the junior; and from 800 to 899, the senior. The freshman and sophomore levels constitute the Lower Division, and the junior and senior levels the Upper Division.

PREREQUISITES

No student may receive credit for a course that is a prerequisite for a more advanced course which the student has already successfully completed unless an exception to this policy is recommended by the appropriate chairpersons (major and subject matter) and approved in writing by the student's academic dean.

GRADING SYSTEM

The final grade for a course completed may be A, B, C, D, or F.

Teachers assign grades on the basis of achievement in the subject matter of the course and in accordance with accepted professional standards for that subject. The grade earned by a student thus represents the quality of work and is not based merely on competition within the class.

The grade of *A* represents exceptional work in which the student shows that he/she has firmly grasped and achieved the objectives of the course.

The grade of *B* indicates very good work, considerable grasp of the essentials of the course, and some insight into its finer points.

The grade of *C* indicates good work and a usable grasp of the essentials of the course.

The grade of *D* indicates a definite, but not necessarily coherent, knowledge of the essentials of the course.

The grade of *F* indicates that the student has not achieved even a minimum grasp of the essentials of the course. This grade can also result from failure to withdraw officially from a course (see *Changes of Registration* above and *Policy on Withdrawal and Refunds* below).

An incomplete grade of *I* may be given to a student who has been doing satisfactory work in a course but who, for reasons beyond control and deemed justifiable by the teacher, had not completed all requirements for a course when grades were submitted. A written explanation of the reason for the *I* must be forwarded to the Records Office for inclusion in the student's permanent record, with copies to the student, department chairman, and dean of the appropriate school. The *I* may be used only for a student *whose previous work in that course has been satisfactory*, and only for reasons beyond that student's control. In no case may an *I* be used to allow a deficient student extra time to avoid failing a course. Similarly, there is no administratively established period of time within which an *I* must be converted, but in no instance may an *I* be converted after a student has received a baccalaureate degree. An *I* may remain on the record for an unlimited period of time and without penalty, assuming it was appropriately given.

Department chairmen are granted authority to convert grades of *I* into final grades in cases where teachers may have severed connections with the University or have become incapacitated before accomplishing conversion of the grade.

A progress grade, *PR*, is given in certain approved courses to indicate that work is still in progress on a project that occupies more than one quarter. This grade is changed to a final letter grade at the end of the quarter in which the work is completed.

The *PR* grade may also be given at the end of the quarter in courses specifically identified as competency-based* to indicate that the student needs more time to demonstrate a mastery of the subject matter. In such instances, the *PR* grade will be converted to a letter grade by the instructor no later than the

end of the subsequent quarter, excluding the summer quarter. A *PR* grade not changed by this time will automatically be converted to an *F* grade.

AU signifies that the student has registered on an audit basis. This mark indicates the registered status of a student who has begun the course on an audit basis or who has changed status to audit before the end of the period to drop a course with a grade of *W* (*i.e.*, before six weeks of a regular quarter or three weeks of a summer term have elapsed).

W represents a withdrawal properly processed from the beginning of the second week through the end of the sixth week of any quarter (from the fifth calendar day through the third week of either summer session.) An unofficial withdrawal or an official withdrawal made after the six-week period (three weeks for either split summer session) will be recorded as F. If the grade resulted from abnormal circumstances, a student may petition the appropriate dean to change the grade to *W*.

Where withdrawals change the status of a student (full-time to part-time), the student immediately forfeits any privileges contingent upon full-time status, and all interested parties which legally require it will be given notification.

The distribution of achievement, and therefore of grades, in a large unselected group of students generally follows the normal frequency curve, in which 5% to 10% are A's, 20% to 25% B's, 40% C's, 20% to 25% D's,and 5% to 10% F's. However, since it is likely that substantial variation from the normal distribution will occur in individual classes, the instructor does not use the "curve" as a standard to be imposed, but only as a model against which the instructor may compare each particular class, using his/her own judgment on the basis of professional standards.

Instructors may use plus and minus modifications of the grades, but they are not recorded or used in calculating the point index.

*The definition of competency-based instruction is to be provided by the instructor responsible for the course.

Credit/No Credit

To encourage students to experiment with courses outside of their major field of concentration a credit/no credit policy exists within the following guidelines.

Youngstown State University students who have completed at least four courses and have a grade point average of 2.0 or better or transfer students admitted unconditionally who have at least 16 quarter hours of transfer credit, may elect to take a course for credit *(CR)* or not for credit *(NC)*.

This option may be elected for a maximum of six courses for the baccalaureate degree or three courses for the associate degree, but not more than one course a quarter.

Courses taken under the *CR/NC* option may not be counted toward a student's major or minor.

Students must indicate their election of the *CR/NC* option at the time of registration, or within the time limits established for adding classes. Students opting for *CR/NC* will not be identified as such on the class roster.

Instructors record grades as usual. If an instructor posts *A, B,* or *C* in the course, a grade of *CR* is recorded. If an instructor posts a grade of *D* or *F* in the course, an *NC* is recorded. In either case the quality point average is not affected.

Credit/No Entry

Grades of credit *(CR)* are used in specified courses that have been deemed inappropriate for traditional achievement grades. A *CR* denotes satisfactory completion of the course, whereas no entry is made on the student's permanent record if work has been unsatisfactory, or if the student has withdrawn from the course.

An *I* (incomplete) may be assigned when additional work must be made up at a subsequent time to complete the requirements for credit.

Traditional Grade/No Entry

To receive credit for Basic Composition I-II or Honors Composition I-II, a student must earn a grade of *C* or better. If the student fails to do so, no record of this attempt will be entered on the transcript.

THE POINT AVERAGE AND SCHOLASTIC STANDING

The student's scholastic standing is indicated by the point average (also called "grade average").

For determining this, every grade has a point value for each quarter hour it represents, as follows: A, four quality points; B, three points; C, two points; D, one point; F,

zero points. For example, an A in a three-hour course is worth 12 quality points; a D in a four-hour course, four points; and an F in any course, zero points. To find the point average, the total number of quality points earned is divided by the total number of attempted quarter hours. Thus a student who attempts 16 quarter hours and earns 40 quality points has a point index of 2.50. Only grades of A, B, C, D, and F are included in the calculation of the point index.

PROFICIENCY IN ENGLISH

The student's ability to express himself/herself in English is not the concern of the Department of English alone, but of every member of the University faculty. Inadequate competence in this respect is to be regarded as a reason for lowering a student's grade in any course in the University.

GRADE REQUIREMENTS AND PROBATION

To indicate to a student what academic situation the point average places him/her in, four categories of academic status have been established: good standing, warning, probation, and suspension. The last three categories are intended as extended opportunities to permit a student ultimately to achieve graduation, not as punishments. Suspension means an unspecified period of separation from the University (generally a minimum of two quarters) to permit maturation in judgment and responsibility on the part of a student, which should improve the student's capacity for academic achievement.

Recognizing that the transition from high school to college may be a difficult one, the University has set the minimum levels of academic achievement during the student's first two years somewhat below what will be required in order to graduate. The point averages required are as follows:

Cr. Hrs.	*GPA*
1-14	1.4
15-29	1.5
30-44	1.6
45-59	1.7
60-74	1.8
75-89	1.9
90+	2.0

A student who falls below the specified average for the number of hours passed will be warned that the student dropped below the minimum grade for good standing. If by the end of the following quarter the student has failed to bring the average up to the minimum, the student will be put on probation. If at the end of the probationary quarter the student has failed to bring the average up to the minimum, the student will be suspended; however, if the student makes substantial improvement during a probationary quarter and averages at least 2.00 for that quarter, the student will be continued on probation even though the student's cumulative average does not reach the minimum.

Transfer students admitted in good standing or on probation must meet those point average requirements indicated for their total hours including transfer hours accepted by the University.

A student seeking admission to the School of Education (at the beginning of the junior year) must have a point index of 2.40 or better; see the School of Education section.

EXCLUDING OLDER GRADES

An undergraduate student currently enrolled may petition the dean of the school to exclude from the calculation of the grade point average grades earned five (5) or more calendar years before. If the petition is approved, all grades (not merely *D's* and *F's)* earned during the specified quarter or semester and all previous grades (not merely *D's* or *F's*) will then be removed from the calculation. However, all grades remain on the permanent record.

Excluded course credit (transfer credit as well) will not count toward the total required hours for graduation. However, courses passed may fulfill basic curriculum requirements and may satisfy as prerequisites for higher courses where applicable. Courses excluded from the calculation may be taken again, and repeated once without infringing upon repeat privileges spelled out in catalog course descriptions. Courses excluded are not subject to credit by examination. A student whose petition has been approved is ineligible for graduation honors. Only one petition from each student may be approved.

GRADE REPORTS

A report of the student's grades is sent to every student by the Registrar as soon after the close of a quarter as possible. The instructor may use other means to provide such information more quickly.

GRADE CHANGES

Application for grade changes may be se-

cured from the office of the school or college in which a student is enrolled, or from the Registrar's Office. Applications for grade changes must be completed by the instructor and must contain the signature of the dean unless the change is from Incomplete (I) or a Progress (PR). All grade changes must be submitted to the Recorder by the dean or instructor; they will not be accepted from the student. In no case may a grade be changed after a student has received a baccalaureate degree.

THE DEAN'S LIST

The Dean's List for each quarter (except summer) includes those full-time undergraduate students who have earned a 3.4 average for not less than 12 quarter hours credit for the quarter just ended.

Included in the listing for the spring quarter are those part-time students who have maintained a 3.4 average for the fall, winter, and spring quarters, and who have accumulated a minimum of 12 quarter hours of credit for the three quarters.

CLASS HONORS

Undergraduate Class Honors are determined by the accumulated point average attained by students enrolled during the most recently completed winter quarter along with undergraduates who completed their degree requirements during the preceding fall quarter. Both full- and part-time students are included provided they have a minimum accumulated point average of 3.00, and provided they have completed a minimum of 18 quarter hours of credit at this University. A person may receive honors only once at each class level. The number of Honors recipients approximates the top one percent of the total enrollment of each class in each undergraduate unit of the University, but it may slightly exceed this figure because of ties.

Class Honors certificates are awarded annually at the Honors Day exercise.

HONORS DAY

The Honors Day exercise recognizes those students who have distinguished themselves academically. Class Honors certificates are given at this exercise, and some of the awards listed under *Awards and Prizes* in the General Information section are announced.

GRADUATION HONORS

(See *Commencement)*

HONORABLE DISMISSAL

A transcript indicates the academic status of a student. Disciplinary action is not shown on a student's academic record.

If a statement of honorable dismissal is needed, the Dean of the appropriate school will furnish one, provided the student is of good character, has a satisfactory record of conduct, has no financial obligations to the University, and is withdrawing voluntarily for acceptable reasons; and provided that the student, if withdrawing during a term, follows the official procedure for a change of registration.

TRANSIENT PERMISSION

A student desiring to attend another institution as a transient student may facilitate acceptance by securing a Transient Permit Application from the Recorder. This form when approved by both the student's advisor and dean should be returned to the Recorder, who will forward a Transient Student Authorization to the institution the student wants to attend.

Approved course work completed with grades of *C* or better at another institution may be transferred back to Youngstown upon the receipt of an official transcript from the institution attended. This transcript must be requested by the student concerned.

FEES AND EXPENSES

All fees are due as indicated in the University calendar published in the bulletin *Schedule of Classes*, and payable as part of the student's registration. Payment of fees is a prerequisite to official enrollment and checks should be made payable to Youngstown State University. Youngstown State University is supported chiefly by legislative appropriations; therefore, fees which the student pays constitute only a part of the actual education costs. Fees are to be paid prior to the beginning of classes. **The University reserves the right to change any fee without notice if conditions warrant.** Registration for a term will be complete when all previous and current fee charges are paid in full. Graduation and transcript of credits will be withheld until the student has met all financial obligations to the University. Recipients of financial aid covering all fees must return their award voucher(s) and the payment notice by the due date in order to be officially enrolled and permitted to attend classes.

The Board of Trustees of Youngstown

State University has established the following fees for 1978-79;*

FOR FULL-TIME STUDENTS (12-16 Quarter Hours)

	Per Quarter	Per Year**
Instate	265.00	795.00
Instate Music Majors (approximate)	329.00	987.00
Out-of-State	485.00	1,455.00
Out-of-State Music Majors (approximate)	569.00	1,707.00

BREAKDOWN OF ACTUAL FEES CHARGED

Instructional Fee	210.00
General Fee	55.00
Non-Resident Tuition Surcharge	220.00
Applied Music Fee per Q.H.	14.00
Charges for each Q.H. above 16 Hours:	
Instructional Fee	19.00
Non-Resident Tuition Surcharge	20.00

FOR PART-TIME STUDENTS (Below 12 Quarter Hours)

Instructional Fee per Q.H.	19.00
General Fee	25.00
Non-Resident Tuition Surcharge per Q.H.	20.00
Applied Music Fee per Q.H.	14.00

*The University reserves the right to change any fee without notice.

**3 academic quarters.

Instructional Fee. These fee charges are intended for the support of the instruction and general program of the University and supplement the legislative appropriation.

General Fee. This fee is used for the support of offices, personnel and general institutional services performed for the benefit of enrolled students, construction and operation of various student facilities such as the student center, together with artists and lecture programs, student government, intercollegiate athletics, student publications, extramural women's activities, and other activities benefiting the student body. Beginning with the first day of classes for each term there can be no reduction or proration of this fee nor is it refundable.

Non-resident Tuition Surcharge. These fee charges are billed to all students who are legal residents of another state or nation (See page 31, *Student Resident Status*).

Applied Music Fee. A per credit hour charge for all students taking applied music lessons for credit or as an auditor.

Individual lessons are provided each week of an academic quarter as follows:

2 cr. hrs.— ½ hr. lesson per week

4 cr. hrs.— 1 hr. lesson per week

6 cr. hrs.—1½ hr. lesson per week

FOR AUDITED COURSES

A student auditing a course or courses pays the regular fees, plus any other fees that may be applicable.

Participants in non-credit courses offered as part of the University's Continuing Education program will be charged fees as approved for the specific class.

If a student withdraws from an audit course and/or a course in Continuing Education, the account will be revised the charges prorated in accordance with the regular University withdrawal and refund policies and their exceptions as stated further on in this section.

TESTING FEES*

American College Test (ACT) Residual Fee. A nonrefundable fee of $8.00 is charged for those students required to take the American College Test (ACT) on a residual basis.

Graduate Management Admissions Test Fee. (GMAT). An aptitude test designed to measure abilities important to the study of business at the graduate level. The test is offered four times a year. The examination fee is $12.50 and registration forms are available at the University Counseling and Testing Center. An additional charge of $4.00 may be applicable if the application is late.

Graduate Record Examination Fee. (GRE). Two Graduate Record Examinations, the Aptitude and Advanced tests, are administered on campus five times a year. Advanced tests are given in twenty (20) different fields. Individual departments specify which test must be taken. The fee for the Aptitude Test is $13.00; one Advanced Test is $13.00. Registration forms are available at the Counseling and Testing Center.

Miller Analogies Test Fee. (MAT). A verbal analogies test to measure scholastic aptitude at the graduate level. This test is offered by appointments only through the University Counseling and Testing Center. The fee of $7.00 is payable at the Bursar's Office.

The Law School Admission Test Fee. (LSAT). The Law School Admission Test is designed to measure certain mental capabilities important in the study of law and aids law

schools in assessing the academic promise of their applicants. The examination fee is $14.00.

New Medical College Admission Test. (MCAT). The test represents an attempt to improve the assessment procedures for admission to medical school. The examination fee is $35.00.

Pharmacy College Admission Test Fee. (PCAT). A test designed for students applying for admission to schools and colleges of pharmacy. The examination fee is $20.00.

Dental Hygiene Aptitude Test Fee. (DHAT). A test for students who are applying for admission to schools and colleges with Dental Hygiene programs. The test fee is $13.00.

National League for Nursing Achievement Fee. (NLN). These comprehensive examinations are used to evaluate the performance of students in terms of national norms and to compare the performance of YSU students with others in similar programs throughout the country. All students registered in Nursing 613 are required to complete these nine (9) tests. The fee of $13.50 is payable at the Bursar's Office.

*Testing fees are determined by testing companies and are subject to change without notice. Current fee information can be obtained at the Counseling and Testing Center.

OTHER FEES

Application Fee. A fee of $15.00 is charged every new student at the time of application for admission to the University. *This fee is nonrefundable.*

Change of Registration Fee. A fee of $6.00 is charged anyone changing registration unless a class in which the student is registered is cancelled or divided by the administration and/or the student completely withdraws from the University. Appeals will be subject to the supervision of the Finance Committee. (Note: Students with changes in registration necessitating an increase in charges will receive a revised bill showing additional payment to be made within 10 days after the revision. Failure to make the additional payment before the due date on the revision will result in an assessment of an additional $5.00 late fee.)

Credit by Examination Fee. A fee of $15.00 is charged for an examination provided by an academic department of the University to determine proficiency and to establish credit in certain subjects toward meeting graduation requirements. Payment should be made at the Bursar's Office window, Jones Hall, first floor, prior to the examination.

Elementary Education Reading Specialist Program Fee. A fee of $50.00 per academic quarter is charged to any elementary pupil enrolled in the University's School of Education Reading Center. The fee must be paid prior to the pupil's enrollment in the program and is considered nonrefundable unless the pupil is withdrawn due to illness. In this case, a doctor's certificate must be presented to the University Bursar who will be responsible for making a prorated refund in accordance with the University's withdrawal and refund policies.

In cases where the elementary pupil's parent or guardian is receiving some form of welfare assistance and the University Bursar is provided with documented evidence of such, the fee will be $10.00 per academic quarter for enrollment, subject to the same withdrawal stipulations.

Early Childhood Practicum in Elementary Education Fee. A fee of $25 per academic quarter is charged to any elementary pupil enrolled in the University's School of Education Early Childhood Practicum. The fee must be paid prior to the pupil's enrollment in the program, and is considered non-refundable unless the pupil is withdrawn due to illness, in which case a doctor's certificate must be presented to the Bursar who is responsible for making a prorated refund in accordance with the University withdrawal and refund policies.

Food Service Meal Tickets. Students not residing in a University residence hall may purchase a meal ticket for any given quarter at the cost of $235.00. This includes three meals a day, Monday through Friday, and two meals on Saturday and Sunday, for the entire eleven-week quarter, except holiday periods. (*See Food Services under Student Personnel Services* for further information.)

Graduation Fee. A fee of $20.00 is charged anyone who is to receive a degree. The fee, which includes cap and gown and diploma, and which helps to defray the general expense attendant to the commencement exercises, must be paid before the official application for graduation is received by the dean of the school in which the student is enrolled. No reduction in this fee may be made for graduation *in absentia* or for approved use of non-academic apparel.

This fee applies for each degree granted (unless honorary), except that if two degrees are to be conferred at the same commencement, the total fee is $25.00 ($5.00 plus the regular $20.00).

All students shall pay one fee for each degree received. Once a student has paid the graduation fee for a specific degree he/she shall not be recharged a graduation fee for that same degree, even if several years lapse before the degree is conferred.

Health and Physical Education Locker and Towel Fees. Users of facilities in the Beeghly Physical Education Center who require clothing change and shower facilities consists of two groups. All users must be enrolled students at YSU, employees of the University, or persons or groups granted permission for use of facilities by the University.

Each student enrolled in a physical education class requiring locker, basket or towel use will be provided this service upon payment of a nonrefundable fee of $2.00 for each quarter of such enrollment.

Each other user will be provided towel service and locker or basket service upon payment of a nonrefundable fee of $3.00 per person for each quarter of such use.

Loss of locker lock shall result in collection of a replacement fee of $3.00 from the user. Loss of towel shall result in collection of a replacement fee of $2.00 from the user.

Identification Card Replacement Fees. A fee of $5.00 is charged for replacement of an I.D. card; this cost includes a current term validation sticker. A fee of $3.00 is charged for replacement of only the current term validation sticker. These fees are nonrefundable.

Insurance for Students. Student Health and Accident Insurance is available to all students. Costs, policy information, and brochures are available at the Bursar's Office, Jones Hall 106. Also see Health Services.

Irregular Examination Fee. When a student is given permission to take an examination at a time other than the scheduled one, a fee of $5.00 is charged at the discretion of the dean, except in the case of illness, when the student must present a letter from a physician.

Late Payment Fee. A fee of $15.00 will be charged any student who pays their bill after the due date but before the payment cutoff date. Registration is considered complete only at the time of payment. Tuition and fees shall be due and payable in full 10 days prior to the opening of classes or as otherwise shown in the academic calendar of the University.

Late Registration Fee. A fee of $30.00 will be charged any current student who failed to register during the assigned period and registers late with new and former students.

Military Equipment Deposit and Fee. Every student taking military science must deposit $10.00 at the beginning of the academic year toward coverage of the cost of United States Government property assigned. When all such property is returned at the end of the year or upon withdrawal from the University, the student is refunded the total deposit; however, if any of the property is lost or damaged, the cost of such property is deducted or charged to the student, depending on the value.

Parking Fines. Fine per offense for parking without registration, illegal parking or other vehicle violation so indicated in the current Youngstown State University Driving and Parking Regulations pamphlet:

$5.00 per offense if paid within thirty days of the offense.

$10.00 per offense if paid after thirty days of the offense. At this time a statement will be sent to the violator. Violations by students will be added to their University fee accounts.

The owner of the offending vehicle or the person to whom the offending vehicle is registered shall be primarily responsible for payment of fines. However, since the vehicles driven by most students are registered in other names, the University assumes that where applicable, the student is the violator and responsible for payment of the fees.

The University shall use whatever means available to collect all parking fines not paid after thirty days of the offense.

The Youngstown State University security officer issuing the ticket has the authority to have the offending vehicle towed if:

1. There are three or more unpaid fines pending against that vehicle.
2. In the opinion of the officer the offending vehicle is blocking the free flow of traffic.
3. It is parking in such a way as to impair the efficient operation of emergency vehicles.
4. It is parked in a "tow-away" zone.

If a violator has reason to appeal the Violation Notification, it must be done by filing an application for appeal within seven days of the date of violation. If an appeal form is not filed within seven days of the date of violation, the violator accepts the violation as valid.

Proficiency Examination Fee. When a student is given permission to take an examination to demonstrate proficiency in a subject, there is a charge of $10.00 except when the student elects to pay the fee for credit by examination and receive course credit for the work covered by the examination.

Readmission Fee. A fee of $5.00 is charged to those students who apply for readmission after interrupting their courses of study for periods longer than one quarter in any academic year. This fee is charged each time a student wishes to reapply after remaining out of attendance longer than one quarter in any academic year. This fee is nonrefundable.

Registration Withdrawal Fee. A fee of $5.00 is charged when a student withdraws from all courses prior to the first day of the quarter, or when the terms under Withdrawals and Refunds are waived by the Bursar. A student who registers for a term and does not complete the registration with payment of fees charged, is also charged this fee when he/she is withdrawn for non-payment 10 days prior to the term.

Residence Hall Fees. Residence hall accommodations include room and food service on a contract basis for the quarter(s) requested. Charges are $435.00 for the first quarter of residency and $410.00 for each subsequent quarter of the year, including summer.

R.O.T.C. Activity Fee. The Military Science Department charges $2.00 each quarter as a special activity fee for all students registered in military science courses. This fee provides funds for the annual Military Ball; awards and recognition for meritorious service to the R.O.T.C. in athletics and extracurricular activities; athletic events and contests; and miscellaneous matters pertinent to the function of the R.O.T.C. Cadet Corps. This fee is nonrefundable.

Special Check-Handling Penalty Fee. A fee of $5.00 is charged any student who pays the University with a check that is not accepted by the bank against which it is drawn. A returned check intended for payment of registration fees will, in addition to this penalty fee, draw a late registration fee of $30.00. If the student's account, including these penalty charges, is not paid in full within five days after written notice, the student will be withdrawn from all classes for that term, and the account will be revised and charges made in accordance with regular University withdrawal and refund policies.

Student Locker Fee. A fee of $1.00 is charged for use of any locker on campus (except those in the Beeghly Center) for all or part of an academic year. All personal property must be removed by the last day of the summer quarter. Locker assignments are made at the Bursar's Office.

Thesis Binding Fee. A fee of $8.00 is charged for each copy bound by the University Library. The fee is the same for personal copies as for those required by the University. Payment should be made at the Bursar's Office.

Transcript of Credits Fee. A fee of $1.00 is charged for each transcript issued by the University. This fee must be paid at the time of the transcript request. Transcripts will not be issued to anyone owing a balance to the University or any of its agents.

Vehicle Registration Permit (Sticker) Fee. A nonrefundable fee of $20.00 is charged each quarter for the purpose of providing access to campus student parking lots, and entrance to such lots is by such sticker affixed to the vehicle in the prescribed manner. A copy of the traffic regulations is issued to all students paying this fee.

Any vehicle not bearing a valid sticker is admitted to an appropriate campus lot on a basis of $1.50 per entrance, collectible at the gate at the time of entrance to the lot.

POLICY FOR WITHDRAWALS AND REFUNDS

A student may not enroll for less than a full term. If a student withdraws from a course or from the University, he/she must fill out an official Change of Registration form and present it to the Bursar's Office. Failure to attend class, or merely notifying the instructor or some other staff member is not an official notice of withdrawal.

If a student is permitted to withdraw from a course or from the University, the account will be revised and charges made according to the following schedule:

Date of Acceptance by Student Accounts Office*	Quarters	Summer Terms 5½ Weeks
1-6 School days†	25%	50%
7-12 school days	50%	100%
13-18 school days	75%	
19th school day	100%	

If a course is cancelled by the University, fees paid will be refunded in full, or in the event of a full scholarship or grant, proper credit will be made to the specified fund. See additional policies and procedures shown below under Exceptions.

Exceptions. A student who withdraws from the University or from a portion of the schedule for reasons beyond his/her control, such as illness, military service, job transfer, or shift change imposed by the employer, may have the fees revised in proportion to the number of weeks attended. The student must withdraw officially and present evidence to validate the change, for example: certificate from a physician giving the date the physician advised the student to withdraw from classes or reduce the academic load, copies of military active duty orders, or a letter from an employer giving the date working hour changes were imposed and a listing of former and current working hours. Charges will be prorated to the number of weeks enrolled. All requests for this action must be handled by mail. Correspondence should be addressed to the Youngstown State University Finance Committe in care of the Bursar.

*Figured from opening date of classes.

†Excludes Sunday, for each specified time period.

College of Applied Science and Technology

Nicholas Paraska, Dean

ORGANIZATION AND DEGREES

MISSION

The College of Applied Science and Technology actively strives to promote the overall University efforts of being preeminent as an educational institution in providing a wide range of programs as stated in the "Declaration of Direction and Outreach," adopted by the Board of Trustees on February 1, 1975 and further amplified in the University mission statement as approved by the Senate on January 9, 1976, and the Board of Trustees on February 21, 1976. To this end the College provides technical education programs whose principal aim is preparation for immediate job entry in various career fields, those baccalaureate programs needed to articulate with two-year programs to provide upward educational mobility, and baccalaureate programs preparing individuals in those applied spheres of learning that directly deal with human health and well-being.

The College, functioning as a University urban technical center, offers two-year programs of study that provide students with an applied scientific education along with an appreciation of the practical skills related to their career choice while developing in them the intellectual and emotional maturity necessary for leadership. As new specialties of work appear in our highly technical society, this College develops new programs related to those specialties which are recognized by the Board of Regents as appropriate technical education programs. Thus, this College continually assesses the changing technical manpower needs of its service area and seeks to provide graduates to meet these needs.

Similarly, baccalaureate programs are offered in the departments of Allied Health, Criminal Justice, Engineering Technology, Home Economics, and Nursing which are primarily designed to articulate with two-year programs to afford upward academic mobility in line with the Board of Regents policy. The Business Education and Technology Department provides the Upper Division courses for the comprehensive business education major for the Bachelor of Science in Education degree offered through the School of Education. When it is determined there is a need for other new baccalaureate programs of this foregoing type, a determination may be made by the administration to have this College develop and offer the new program. Graduate work is offered as approved by the Graduate School.

The guiding principles in developing new programs have been and will continue to be to:

a. utilize professional expertise within the total University
b. make full use of existing courses within the University before creating new courses
c. make new courses a part of the offering of the College of Applied Science and Technology
d. employ faculty to teach in these programs who possess the professional qualifications and are dedicated to the applied programs.
e. structure the curriculum to most fully enhance the employability of graduates
f. appoint advisory committees to provide input about the need and content of programs
g. assess need for new programs by surveys of prospective employers and propspective students as well as through use of advisory committees
h. consider availability of programs in nearby institutions to avoid unnecessary duplication

The College of Applied Science and Technology has the following six departments and the programs therein:

(A) denotes two-year programs.

(B) denotes four-year programs.

Allied Health Department

Dental Hygiene Technology (A)
Emergency Medical Technology (A)
Medical Assisting Technology (A)
Medical Laboratory Technology (A)
Medical Technology (B)
Respiratory Therapy Technology (A)

Business Education and Technology Department

Accounting Technology (A)
Advertising Technology (A)
*Business Education (B)
Business Management Technology (A)
Court/Conference Reporting (A)
Graphics Technology (A)
Marketing Technology (A)
Public Administration Technology (A)
Real Estate Technology (A)
Secretarial Studies (A)
Transportation Management Technology (A)

Criminal Justice Department

Corrections (B)
Law Enforcement Administration (B)
Police Science Technology (A)

Engineering Technology Department

Civil Engineering Technology (A) (B)
Computer Technology (A) (B)
Drafting and Design Technology (A)
Electrical Engineering Technology (A) (B)
Mechanical Engineering Technology (A) (B)

Home Economics Department

Child Care Technology (A)
Dietary Technology (A)
Food and Nutrition (B)
Home Economics (B)

* in cooperation with School of Education.

Nursing Department

Nursing (A) (B)

The student whose needs are not completely met by existing conventional programs may wish to investigate and apply for the Individualized Curriculum Program (see the General Requirements and Regulations section).

R.O.T.C. students are allowed certain modifications of the requirements, as explained in the General Requirements and Regulations section.

It is the student's responsibility to satisfy all the graduation requirements for the degree sought. These consist of:

1. The pre-college or preparatory courses for each degree as covered in the General Requirements and Regulations section.

2. The courses and other requirements to be completed in the University as explained in the General Requirements and Regulations section.

3. The specific curriculum requirements of a given program.

COURSES OF INSTRUCTION AND CURRICULUMS†

ALLIED HEALTH

Associate Professor Yemma (Chairman); Assistant Professor Haggerty; Instructors Boyd, Feld, Harris, Soller, and Solovan.

The department offers allied health programs that train individuals to function as members of the health delivery team. Current programs are offered in dental hygiene technology, medical assisting technology, medical technology, and respiratory therapy technology. The detailed requirements appear under the specific program.

Academic Requirements for the Two-Year Associate Degree Programs

Admission into the Allied Health Programs is on a restricted basis since a limited number of students can be accommodated. A copy of the admission policies and specific information can be obtained from the Admissions Office, or the Allied Health Department.

Grades of "C" or better are required in courses in the major area in all Allied Health programs.

DENTAL HYGIENE TECHNOLOGY

Assistant Professor Haggerty (Coordinator).

Youngstown State University offers a two-year program in Dental Hygiene Technology which leads to the Associate in Applied Science degree. The program is designed to prepare hygienists for work in private practice and in public health projects. Graduates will be eligible to take the licensing exam for the registered dental hygienist.

Under the supervision of the dentist and in accordance with state dental practice acts, the licensed dental hygienist removes stains and deposits from teeth, takes X-rays, charts suspicious areas of possible decay and periodontal disease, applies fluoride, takes study models, sterilizes instruments and assists the dentist.

The hygienist also functions as a dental educator and is responsible for the preventive dental health program in the office. The hygienist teaches the patient proper oral health care in order to reduce dental diseases and disorders. Some states permit the hygienist to perform additional duties such as administering anesthesia and the placement of restorative materials.

Students are admitted to the Dental Hygiene Technology program only once a year, at the beginning of the fall quarter. Enrollment is limited, so early application is advised. Application deadline is March 1. Prior to this date, the Dental Hygiene Aptitude test must have been taken. A personal interview is also required. Former, transfer and current student applicants, in addition to meeting the requirements outlined in the Admissions Policies, must have taken a beginning college chemistry course and have an acceptable point average from all colleges attended.

501. *Dental Hygiene I.* An introduction to dental hygiene and its role as an integral part of the dental health profession. Medical-dental terminology and clinical records. Three hours lecture. Prereq.: Permission of coordinator. 3 q.h.

501L. *Clinical Dental Hygiene I.* A detailed study of planning patient care, patient preparation and positioning in the dental chair, patient instruction in oral physiotherapy, principles of dental instrumentation and instrument sharpening. Six hours lab per week. Prereq.: Permission of coordinator. 2 q.h.

†The student should be familiar with the course-numbering system and its significance, as well as the abbreviations used to indicate the amount of credit. These are explained at the end of the General Requirements and Regulations section.

502. *Dental Hygiene II.* Discussion of clinical procedures and records. Particular emphasis on the principles and skills needed for effective patient education. Two hours lecture. Prereq.: DH 501 2 q.h.

502L. *Clinical Dental Hygiene II.* Clinical application of dental hygiene techniques. Services include oral prophylaxis, fluoride application and patient education. Nine hours lab per week. Prereq.: DH 501L 3 q.h.

503. *Dental Hygiene III.* Methods and materials used in plaque control instruction. The application and effectiveness of fluoride products. One hour lecture. Prereq.: DH 502 1 q.h.

503L. *Clinical Dental Hygiene III.* Clinical application of dental hygiene techniques. Services to patients include oral prophylaxis, radiographs, fluoride application and patient education. Nine hours lab per week. Prereq. DH 502L. 3 q.h.

520. *Dental Anatomy I.* Oral topography, basic terminology of soft and hard oral structures. The dentition is presented both as system entities and components. The symptomology and classification of dental caries. Two hours lecture. Prereq.: Permission of supervisor. 2 q.h.

520L. *Dental Anatomy Lab I.* The study of individual tooth morphology including drawing teeth from models and waxing onto prepared dies. Recognition and identification of natural teeth and classifications of occlusion. Three hours lab per week. Prereq.: Permission of supervisor. 1 q.h.

521. *Dental Anatomy II.* The anatomy of the head and neck considering the relationship of the bone structure, muscles, nerves, arterial supply and lymphatic system. Prereq.: DH 520. 2 q.h.

525. *Oral Histology and Embryology.* An introduction to the microscopic structure of the body by simple discussion of the cell concept is given. Normal and abnormal tissues are shown and discussed. The embryonic development of the face and oral cavity is presented. Prereq.: DH 520. 3 q.h.

530. *Dental Radiology.* Radiographic theory, techniques and use of diagnosis and prevention of dental and related diseases. History and development of X-rays, hazardous effects of radiation and methods of protection. 2 q.h.

530L. *Dental Radiology Lab.* The technical skills necessary to expose, develop and mount dental films in the office. Three hours lab per week. 1 q.h.

535. *General and Oral Pathology.* The cause and nature of disease, together with anatomical and functional changes are discussed. The observation and progress of disease in the human is related to diagnosis and treatment planning by the dentist. Special emphasis is given to oral pathology. 3 q.h.

601. *Dental Hygiene IV.* Introduction to the principles of ultrasonic scaling. Application of practical knowledge of nutritional science to patient education. One hour lecture. Prereq.: DH 503 1 q.h.

601L. *Clinical Dental Hygiene IV.* Continued clinical experience. Completion of two plaque control patients in addition to a required number of prophylaxes. Utilization of the ultrasonic scaler. The following tests are included: Blood Pressure, Diabetes. Twelve hours lab per week. Prereq.: DH 503L. 4 q.h.

602. *Dental Hygiene V.* Lectures and demonstrations in the principles of four-handed dentistry and dental assisting. One-hour lecture. Prereq.: DH 601 1 q.h.

602L. *Clinical Dental VI.* Continued clinical experience. Completion of one proficiency patient and two plaque control patients in addition to a specified number of oral prophylaxes. A comprehensive examination, charting and history of a periodontally involved patient is required. Prereq.: DH 601L. 4 q.h.

603. *Dental Hygiene VI.* Discussions of modified dental hygiene procedures for physically or mentally handicapped patients. One-hour lecture. Prereq.: DH 602. 1 q.h.

603L. *Clinical Dental Hygiene VI.* Continued clinical experience. Completion of one proficiency patient and two plaque control patients in addition to specific clinical requirements. Prereq.: DH 602L. 4 q.h.

611. *Dental Materials.* The source, physical properties, methods of manufacturing, and uses of various dental materials are presented. Two hours lecture per week. Prereq.: Second year standing in DHT. program. 2 q.h.

611L. *Dental Materials Lab.* Selected dental materials are manipulated in laboratory procedures so that the student will be able to assist the dentist at the chair, as well as perform certain laboratory procedures and specified clinical duties. Three hours lab per week. Prereq.: Second year standing in DHT. program. 1 q.h.

615. *Dental Health Education.* A lecture and laboratory course to introduce educational concepts, objectives, methodology in oral health instructions. It provides the opportunity for the student to act as an educator in a classroom situation and in professional groups by table clinic presentations. Two hours lecture and three hours lab per week. 3 q.h.

620. *Periodontics.* The clinical features and etiology of periodontal disease will be discussed. Treatment planning and the classification of periodontal disease will be presented. The role of the hygienist in patient education for the prevention of periodontal disease will be emphasized. Three hours lecture. Prereq.: DH 535. 3 q.h.

625. *Community Denistry.* A study of the epidemiology of dental disease. Particular attention is given to means of preventing and controlling dental disease and promoting dental health through organized community efforts. Two hours lecture and three hours lab per week. Prereq.: DH 615. 3 q.h.

640. *Dental Specialties.* An introduction to the practice, principles and armamentarium in the following dental specialties: anesthesia, endodontics, operative dentistry, oral diagnosis, oral surgery, orthodontics, pedodontics, periodontics and prosthodontics. Dental research and dental assisting to widen the spectrum of the knowledge of the dental hygienist. 3 q.h.

641. *Dental Office Management and Jurisprudence.* Business procedure and accounting systems in a dental office are studied. The scope and role of dental hygiene and responsibilities and ethics of the dental hygienist are presented. Legal definitions pertinent to dentistry are discussed. The laws relating to the practice of dentistry and dental hygiene in the State of Ohio are given in detail. Three hours lecture per week. 3 q.h.

DENTAL HYGIENE TECHNOLOGY CURRICULUM

FIRST YEAR

FIRST QUARTER	Hrs.
Dental Hygiene 501 Dental Hygiene I	3
Dental Hygiene 501L Clinical Dental Hygiene I	2
Dental Hygiene 520 Dental Anatomy I	2
Dental Hygiene 520L Dental Anatomy Lab I	1
Chem. 502 Survey of Chemistry II	4
Biol. 551 Physiology and Anatomy I	4
	16

SECOND QUARTER	Hrs.
Dental Hygiene 502 Dental Hygiene II	2
Dental Hygiene 502L Clinical Dental Hygiene II	3
Dental Hygiene 530 Dental Radiology	2
Dental Hygiene 530L Dental Radiology Lab	1
Dental Hygiene 521 Dental Anatomy II	2
Biol. 552 Physiology and Anatomy II	4
Chem. 503 Survey of Chemistry III	4
	18

THIRD QUARTER	Hrs.
Dental Hygiene 503 Dental Hygiene III	1
Dental Hygiene 503L Clinical Dental Hygiene III	3
Dental Hygiene 525 Oral Histology and Embryology	3
Dental Hygiene 535 General and Oral Pathology	3
Biol. 560 Paramedical Microbiology	5
Speech 550 Principles of Speech Communication	4
	19

FOURTH QUARTER (SUMMER)	Hrs.
Home Ec. 551 Normal Nutrition	4
Psych. 560 General Psychology	4
Soc. 500 Fundamentals of Sociology	4
Engl. 550 Basic Composition I	4
	16

SECOND YEAR

FIFTH QUARTER	Hrs.
Dental Hygiene 601 Dental Hygiene IV	1
Dental Hygiene 601L Clinical Dental Hygiene IV	4
Dental Hygiene 611 Dental Materials	2
Dental Hygiene 611L Dental Materials Lab.	1
Dental Hygiene 615 Dental Health Education	3
Dental Hygiene 620 Periodontics	3
Dental Hygiene 640 Dental Specialties	3
	17

SIXTH QUARTER	Hrs.
Dental Hygiene 602 Dental Hygiene V	1
Dental Hygiene 602L Clinical Dental Hygiene V	4
Dental Hygiene 625 Community Dentistry	3
Dental Hygiene 641 Dental Office Management and Jurisprudence	3
MA 605 Introduction to Pharmacology	4
	15

SEVENTH QUARTER	Hrs.
Dental Hygiene 603 Dental Hygiene III	1

Dental Hygiene 603L Clinical Dental Hygiene III	4
H&PE 601 First Aid	3
	8
Total credit hours	**109**

EMERGENCY MEDICAL TECHNOLOGY

Emergency Medical Technology programs are designed to train persons to provide pre-hospital care services to people experiencing health crises. The curriculum includes training for three levels of practitioners including two certificate programs and the Associate Degree in Applied Science.

Legel I, the Basic Training Program for the Emergency Medical Technician-Ambulance, can be attained after successfully completing one quarter of study. At that time, the student is eligible for the Ohio State certification examination and National Registry of Emergency Medical Technicians.

Level II, the Training Program for Emergency Medical Technicians-Paramedic, can be attained after successfully completing four quarters of full-time study. The course of study provides the student with knowledge about the recognition, assessment and supervised practice of emergency medical care in the hospital and in advanced life-support ambulance situations.

Level III, the Advanced Training Program with Clinical Paramedical Experiences completes the two-year study with an Associate Degree in Applied Science. The course of study affords the practitioner application of organizational and managerial principles in various emergency services.

Admission procedures are the same as those applicable to the University and the Allied Health department with the addition of a minimum age of 18 years, a current driver's license, and an interview by a selection committee. The student with an EMT-A certification desiring advanced standing in the program is required to show evidence of certification, must have successfully passed the National Registry Examination, and have a recommendation from an instructor, physician or employer in the field.

501. *Basic Emergency Victim Care.* A study of various medical injuries and illness encountered in emergency situations. Must be taken concurrently with EMT 502. 3 q.h.

501L. *Basic Emergency Victim Care Laboratory.* Laboratory experiences are used to teach assessment and treatment techniques. Includes a practicum in a hospital equipped with ambulance service necessary for observation and training. Six hours laboratory. 2 q.h.

502. *Emergency Medical Technology Orientation.* Introduction to the duties, legal and ethical responsibilities, and job opportunities for Emergency Medical Technicians. Emphasis is on the individual's relationship with the patient, community, and co-workers. Must be taken concurrently with EMT 501. 4 q.h.

510. *Emergency Medical Condition I.* Continuation of EMT 501. A study of the most common medical emergencies normally encountered including an emphasis on pathophysiology and etiology. Prereq.: EMT 501 and 501. Must be taken concurrently with EMT 511. 3 q.h.

511. *Emergency Medical Techniques I.* A study of techniques necessary to treat emergency conditions introduced in EMT 510. Must be taken concurrently with EMT 510. 3 q.h.

511L. *Emergency Medical Techniques Laboratory I.* Laboratory includes simulated emergency situations in an actual hospital setting with ambulance service. Three-hour laboratory. Four-hour clinical. Must be taken concurrently with EMT 511. 2 q.h.

512. *Rescue Squad Experience.* Clinical experience with an approved Rescue Squad under the supervision of trained EMT Personnel. Completion of 10 emergency runs is required. Eight hours clinical per week. 2 q.h.

520. *Emergency Medical Condition II.* A study of intense emergency coronary and respiratory care including artery disease, myocardial infarction, angina pectoris, congestive heart failure, and pulmonary dysfunction. The course deals with pathophysiology and symptomatology of these conditions. Four-hour lecture. Prereq.: EMT 510. To be taken concurrently with EMT 521. 4 q.h.

521. *Emergency Medical Techniques II.* A study of techniques required to treat coronary and respiratory emergencies. To be taken concurrently with EMT 520. 3 q.h.

521L. *Emergency Medical Techniques Laboratory II.* Laboratory includes simulated emergency situations of coronary and respiratoryy problems, and clinical experiences with ambulance service. Three-hour laboratory. Four-hour clinical. 2 q.h.

522. *Rescue and Rappelling.* A course

covering the principles of extrication and patient handling. 2 q.h.

522L. *Rescue and Rappelling Laboratory.* Laboratory includes experience with light rescue equipment appropriate for a variety of crisis situations. Three-hour laboratory. 1 q.h.

523. *Communications Systems and Defensive Driving.* A study of regulations, limitations and maintenance of communications systems. Also principles of defensive driving, particularly for ambulance operating under emergency conditions, are considered. 2 q.h.

523L. *Communication Systems and Defensive Driving Laboratory.* Practice in utilization of various communication syystems and demonstration of defensive driving techniques in emergency vehicles. Three laboratory hours. 1 q.h.

600. *Emergency Vehicle Experience.* A practical experience with an emergency vehicle squad to observe and perform emergency duties under supervision. Prereq.: EMT 520. Sixteen clinical hours per week; one-hour seminar. 4 q.h.

601. *Advanced Emergency Conditions I.* Explores the treatment response to severely emergent medical conditions with emphasis on assessment, monitoring and life-supporting procedures. Prereq.: EMT 520. To be taken concurrently with EMT 602. 3 q.h.

602. *EMT-P Clinical Experience I.* Clinical experiences in hospital facilities, and emergency vehicles emphasizing severely emergent medical conditions. Twelve clinical hours per week. To be taken concurrently with EMT 601. 3 q.h.

610. *Advanced Emergency Conditions II.* Lecture course exploring the treatment response to severely emergent surgical conditions with emphasis on assessment, monitoring and life-suporting procedures. Prereq.: EMT 611. 3 q.h.

611. *EMT-P Clinical Experience II.* Clinical experiences in hospital facilities and emergency vehicles, emphasizing severely emergent surgical conditions. Twelve clinical hours per week. To be taken concurrently with EMT 610. 3 q.h.

620. *Leadership of Paramedic Technology.* A practical experience performing clinical and administrative duties under supervision with a rescue squad. One-hour seminar; four clinical hours per week. Prereq.: EMT 610. 2 q.h.

EMERGENCY MEDICAL TECHNOLOGY

CURRICULUM

FIRST YEAR

FIRST QUARTER	Hrs.
EMT 501 Basic Emergency Victim Care	3
EMT 501L Basic Emergency Victim Care Lab	2
EMT 502 Emergency Medical Technology Orientation	4
H&PE 601 First Aid and Personal Safety	3
Biol. 551 Physiology and Anatomy of Man I	4
Level I EMT-A	16

SECOND QUARTER	Hrs.
EMT 510 Emergency Medical Conditions I	3
EMT 511 Emergency Medical Techniques I	3
EMT 511L Emergency Medical Techniques Laboratory I	2
EMT 512 Rescue Squad Experience	2
Chem. 502 Chemistry 502	4
Biol. 552 Physiology and Anatomy of Man II	4
	18

THIRD QUARTER	Hrs.
EMT 520 Emergency Medical Condition II	4
EMT 521 Emergency Medical Techniques II	3
EMT 521L Emergency Medical Techniques Laboratory II	2
EMT 523 Communications Systems and Defensive Driving	2
EMT 523 L Communications Systems and Defensive Driving Laboratory	1
MA 605 Pharmacology	4
	16

FOURTH QUARTER (SUMMER)	Hrs.
EMT 600 Emergency Vehicle Experience	4
Psych. 560 General Psychology	4
Level II EMT-P	8

SECOND YEAR

FIFTH QUARTER	Hrs.
EMT 601 Advanced Emergency Conditions I	3
EMT 602 EMT-P Clinical Experience I	3
EMT 522 Rescue and Rappelling	2
EMT 522L Rescue and Rappelling Laboratory	1
Engl. 550 Basic Composition I	4
Psych. 702 Abnormal Psychology	4
	17

SIXTH QUARTER	Hrs.
EMT 610 Advanced Emergency Conditions II	3
EMT 611 EMT-P Clinical Experience II	3
Pol. Sc. 600 Elements of Politics	3
Soc. 500 Fundamentals of Sociology	4

Geog. 731 Geographical Aspects of City & Regional Planning	4
	17

SEVENTH QUARTER	Hrs.
EMT 620 Leadership of Paramedic Technology I	2
H&PE 630R Life Saving Techniques	3
Mgmt. 725 Fundamentals of Management	4
Speech 550 Principles of Speech	4
Rel. 710 Basic Public Relations	3
Level III Associate Degree	16
Total credit hours	**108**

MEDICAL ASSISTING TECHNOLOGY
Instructor Feld (Coordinator)

The medical assisting technology program is a two-year program leading to the Associate in Applied Science degree. It provides an opportunity to obtain the education needed to perform receptionist, bookkeeping, and other office managerial duties, and assist the physician in physical examinations, minimal laboratory tests and patient recordkeeping in private physician offices, clinics, or hospital outpatient departments. High school prerequisites for this program include biology, chemistry, algebra I, geometry or algebra II, and business typing (personal typing does not substitute). Minimum scores of 18 in each test category of the ACT, or its equivalent, are required.

A grade of *C* or better is required in all Medical Assisting courses, and a 2.0 overall G.P.A. must be maintained to continue in the program. Prior to scheduling the externship, the student records will be reviewed by the department to determine if all previous courses in the program have been satisfactorily completed and any deficiencies made up.

The student is required to have a physical examination report with a negative tuberculin screening test prior to the externship.

501. *Medical Terminology.* Structure of medical words, pronunciation and meaning of medical terms. 4 q.h.

502. *Law and Ethics.* Type of medical practice. Legal relationship of physician to patient, i.e., professional liability, implied and informed consent, malpractice, invasion of privacy. Emphasis on professional attitude and behavior. 4 q.h.

600. *Insurance Forms and Medical Records.* Standard insurance forms; preparing and updating medical charts and records. Two hours lecture; two hours lab per week. Prereq.: MA 501. 3 q.h.

605. *Introduction to Pharmacology.* Identification and interaction of the basic drugs utilized in patient care. The pharmacological action and effects on the patient. Various modes of administration and their rationale, and patient education regarding the effects of common drugs. Prereq.: Chem. 502. 4 q.h.

610. *Paramedical Patient Care.* Introduction to roles and functions of allied health personnel in physicians' offices and clinics including principles of nursing skills and procedures. Three hours lecture; three hours lab. Prereq.: MA 501 and MA 502. 4 q.h.

612. *Medical Assisting Seminar.* Problems and situations the Medical Assistant encounters in the physician's office. Open to Medical Assisting students only. 1 q.h.

680. *Clinical Procedures.* Assisting the physician with technical procedures, coping with a medical emergency, understanding the purpose, techniques and recording of laboratory procedures and organizing and maintaining medical supplies. Two hours lecture; three hours lab. Prereq.: MA 610. 3 q.h.

690. *Externship.* Practical, nonpaid experience in office of qualified physician. Will perform clinical and administrative procedures under supervision. Eighteen hours weekly in medical office and one hour seminar per week. 6 q.h.

MEDICAL ASSISTING TECHNOLOGY CURRICULUM

FIRST YEAR

FIRST QUARTER	Hrs.
MA 501 Medical Terminology	4
Engl. 550 Basic Composition I	4
BE&T 521 Typing II	2
Psych. 560 General Psychology	4
Chem. 502 Survey of Chemistry II	4
	18

SECOND QUARTER	Hrs.
MA 502 Law and Ethics	4
Engl. 551 Basic Composition II	4
Biol. 551 Physiology and Anatomy of Man I	4
MA 600 Insurance Forms and Medical Records	3
H&PE 590 Health Education	3
	18

THIRD QUARTER	Hrs.
Soc. 500 Fundamentals of Sociology	4
BET 740 Records System Theory and Practice	3
Biol. 552 Physiology and Anatomy of Man II	4
MA 605 Introduction to Pharmacology	4
	15

SECOND YEAR FOURTH QUARTER	Hrs.
MA 612 Medical Assisting Seminar	1
MA 610 Paramedical Patient Care	4
Acctg. 604 Accounting for Professional Offices	5
BET 510 Office Procedures	4
H&PE 601 First Aid and Personal Safety	3
	17

FIFTH QUARTER	Hrs.
MA 680 Clinical Procedures	3
Biol. 560 Paramedical Microbiology	5
BET 622 Typewriting VI	2
BET 731 Special Dictation	4
BET 720 Personal Relations	4
	18

SIXTH QUARTER	Hrs.
MA 690 Externship	6
Hist. 699 History of Science & Medicine	4
Elective Humanities	4
	14
Total credit hours	**100**

To be taken concurrently: BET 622, 731

Typewriting courses will depend on typewriting background.

MEDICAL LABORATORY TECHNOLOGY

Instructor Boyd (Coordinator)

Medical Laboratory Technology is a two-year program leading to the degree Associate in Applied Science in Medical Laboratory Technology.

The medical laboratory technician works in a supportive role in a hospital, private laboratory, clinic, public health facility or pharmaceutical laboratory, performing a variety of clinical tests with appropriate supervision. These tests may be utilized by a qualified physician for the determination of the presence and extent of disease, as well as implications pertaining to the cause of the disease.

The program meets the standards developed by the American Society of Clinical Pathologists and the American Society of Medical Technologists through the National Accrediting Agency for Clinical Laboratory Sciences.

Refer to the Allied Health Admission Policies for the Admission requirements.

Meeting minimum requirements for admission does not assure acceptance into the Medical Laboratory Technology program. Applicants being considered will be interviewed by the Medical Laboratory Technology Admissions Committee.

501. *Introduction to Medical Technology.* Introduction to the field of Medical Laboratory Science and the purpose of various tests, quality control emphasis, ethics, and responsibilities. Prereq.: Admission to the MLT program. Must be taken concurrently with MLT 501L. 3 q.h.

501L. *Introduction to Medical Technology Laboratory.* The students will observe demonstrations of instruments and phlebotomy techniques in the hospital and clinical laboratory. Three hours laboratory per week. Must be taken concurrently with MLT 501. 1 q.h.

502. *Medical Laboratory Methodology I.* Theory and techniques in the skills involving laboratory instruments, the preparations of solutions, and urinalaysis procedures. Emphasis on laboratory recordkeeping and safety. Prereq.: Biol. 506, 507. To be taken concurrently with MLT 502L. 2 q.h.

502L. *Methodology Laboratory I.* Use of centrifuges, balances, pipets, microscopic examination of urine, (with emphasis on cells and casts) and quantitative and qualitative urine and kidney tests. Three hours laboratory per week. To be taken concurrently with MLT 502. 1 q.h.

601. *Medical Laboratory Methology II.* Theoretical and practical knowledge related to chemistry as they apply to chemistry in the medical laboratory with emphasis on quality control and instrumentation. Prereq.: Chem. 517, MLT 502. Must be taken concurrently with MLT 601L. 2 q.h.

601L. *Laboratory Methodology II.* Test procedures include titremetric, colorimetric, and spectophotometric methods for glucose, bilirubin, enzymes, electrolytes, and blood gases. Three hours of laboratory per week. To be taken concurrently with MLT 601. 1 q.h.

700. *Diagnostic Radioimmunoassays.* The basic concept of RIAs and its combination with competitive protein binding analysis. Two hours of lecture per week. Prereq.: Chem. 517. To be taken concurrently with MLT 700L. 2 q.h.

700L. *Diagnostic Radioimmunoassays Laboratory.* Insulin, Thyroid, Digoxin, B12 and folic acid test procedures used in the clinical laboratory. Six hours laboratory per week. Must be taken concurrently with MLT 700. 2 q.h.

703. *Clinical Immunology.* Fundamentals of antigen-antibody reactions applied to serological procedures performed in the clinical laboratory. Two hours of lecture per week. Same as Biol. 703. Prereq.: Biol. 702. Must be taken concurrently with MLT 703L. 2 q.h.

703L. *Clinical Immunology Laboratory.* Includes VDRLS, ASO, Febrile, Latex, Pregnancy and Viral Tests. Will also include Flocculation, Precipitation, Complement Fixation and Titration Procedures of various diseases. Three hours of laboratory per week. Same as Biol. 703L. Must be taken concurrently with MLT 703. 1 q.h.

*705. *Medical Laboratory Internship.* Practical application of skills learned in previous six quarters. Students are assigned to accredited hospital laboratories as trainees. Prereq.: Successful completion of the previous six quarters of Medical Laboratory Technology courses. Twenty-one clinical hours per week in accredited hospital laboratory. To be taken concurrently with MLT 706. 3 q.h.

706. *Medical Laboratory Seminar.* Special problems concerning the internship will be discussed with the coordinator. To be taken concurrently with MLT 705. 1 q.h.

729. *Clinical Hematology.* The origin and formation of blood cells, the coagulation mechanism and its factors and blood group systems are discussed. Prereq.: Biol. 560, 507, 508. To be taken concurrently with MLT 729L. 2 q.h.

729L. *Clinical Hematology Laboratory.* Includes counting red and white cells, reticulocytes, and eosinophiles; differential morphology, staining qualities, recognition of cells; procedures such as prothrobin time, ptts, coagulation time, blood grouping and compatability testing. Three hours of laboratory per week. To be taken concurrently with MLT 729. 1 q.h.

788. *Diagnostic Microbiology.* A clincial approach to the study of bacteria, fungi, and other micro-organisms including the identification of organisms encountered in the clinical laboratory. Six hours of laboratory per week. Same as Biol. 788. Prereq.: Biol. 702. 2 q.h.

MEDICAL LABORATORY TECHNOLOGY CURRICULUM

FIRST YEAR

FIRST QUARTER	Hrs.
Chem. 515 General Chemistry	4
Biol. 506 General Biology	4
MLT 501 Introduction to Medical Technology	3
MLT 501L Introduction to Medical Technology Laboratory	1
MA 501 Medical Terminology	4
	16

SECOND QUARTER	Hrs.
Chem. 516 General Chemistry II	4
Biol. 507 General Biology	4
Engl. 550 Basic Composition I	4
Biol. 551 Anatomy and Physiology of Man I	4
	16

THIRD QUARTER	Hrs.
Chem. 517 General Chemistry III	4
Biol. 508 General Biology	4
Biol. 552 Anatomy and Physiology of Man II	4
MLT 502 Medical Laboratory Methodology I	2
MLT 502L Medical Laboratory Methodology I Laboratory	1
	15

FOURTH QUARTER (SUMMER)	Hrs.
Engl. 551 Basic Composition II	4
Elective Humanities or Social Science	4
MLT 601 Medical Laboratory Methodology II	2
MLT 601L Medical Laboratory Methodology II Laboratory	1
Chem. 604 Quantitative Analysis I	5
	16

FIFTH QUARTER	Hrs.
Math 714 Probability and Statistics	5
Biol. 702 Microbiology	4
MLT 700 Diagnostic Radioimmunoassays	2
MLT 700L Diagnostic Radioimmunoassays Laboratory	2
Engl. Tech. 500 Data Process Concepts	4
	17

SIXTH QUARTER	Hrs.
Psych. 560 General Psychology	4
MLT 788 Diagnostic Microbiology	2
MLT 703 Clinical Immunology	2
MLT 703L Clinical Immunology Laboratory	1
Non-technical Elective	3
	12

SEVENTH QUARTER	Hrs.
*MLT 705 Medical Laboratory Internship	3
MLT 729 Clinical Hematology	2
MLT 729L Clinical Hematology Laboratory	1
MLT 706 Medical Laboratory Seminar	1
H&PE 509 Health Education	3
	10
Total credit hours	102

***Medical Laboratory Internship Guidelines**

Students must have a G.P.A. of 2.5 in order to enroll for 705 Internship, and must maintain a 2.5 to graduate. Prior to taking courses in which the internship is scheduled, each student record will be reviewed by the department to determine if all courses taken in the program prior to the quarter in which the internship is scheduled, have been satisfactorily completed and any deficiencies made up.

Degree Offered

Upon successful completion of the program the student becomes eligible to receive the degree Associate in Applied Science in Medical Laboratory Technology and take the National Board (ASCP) examination to become certified as a Medical Laboratory Technician (ASCP).

MEDICAL TECHNOLOGY

Instructor Boyd (Coordinator)

Medical Technology is a four-year program leading to a Bachelor of Science degree in Applied Science with a major in Medical Technology.

The Medical Technologist is a specialized member of the health care profession performing a variety of tests in hospital and private laboratories, clinics, armed forces, federal health agencies, pharmaceutical houses and research programs.

The myriad of procedures performed or supervised by the medical technologist may be utilized by a qualified physician, for the determination of the presence and extent of disease and the types of treatment to be employed. The results can also provide information indicating the absence of disease.

Since the work frequently deals with life and death matters which require precision, dependability, and a strong sense of responsibility, students must have an aptitude and interest in the physical and biological sciences.

The program, as designed, goes beyond meeting the minimum requirements of the National Accrediting Agencies for Laboratory Science.

The program is designed to ensure a thorough understanding of the biological and physical sciences and to present to the student the artful applications of scientific principals that are practiced in the clinical laboratory.

Application deadline for Medical Technology is March 1.

Upon completion of three years of the program at the University and a year in a hospital school accredited by the Americnn Society of Clinical Pathologist (ASCP), the students become eligible to take the national board (ASCP) examination to become certified as MT (ASCP) and receive a Bachelor of Science degree in Applied Science with a major in Medical Technology.

MEDICAL TECHNOLOGY CURRICULUM

FIRST YEAR	Hrs.
Chem. 515, 516, 517	12
Biol. 506, 507, 508	12
Engl. 550, 551	8
H&PE 590	3
H&PE Activity	1
Biol. 551, 552	8
Electives (See note a)	4
	48

SECOND YEAR	Hrs.
Chem. 719, 720, 721	12
Chem. 603, 604	10
Mathematics 714	5
MLT 700 Diagnostic Radioimmunoassays	4
MLT 788 Diagnostic Microbiology	2
Physics 501	4
Electives (See note a)	12
	49

THIRD YEAR	Hrs.
Chem. 711, 712, 713	8

Biol. 702	4
Physics 502, 502L, 503, 503L	8
H&PE Activity	2
MLT 703 Clinical Immunology	3
MLT 729 Clinical Hematology	3
Electives (See note a)	8
Elective (See note b)	4
Elective (Free)	3
	43

FOURTH YEAR	Hrs.
Satisfactory completion of the internship in an accredited hospital school of Medical Technology (The 46 hours includes credit for 23 hours of upper division and 3 hours of Chemistry.)	46
	46

Note (a): The electives must satisfy the University requirements for upper division credit, the social studies and the humanities.

Note (b): Suggested science electives Biol. 837 or Chem. 730—4 hours

Hours required for graduation:	
Academic	180
Non-Academic	6
TOTAL	**186**

Medical Technology Internship Guidelines

Students applying for an internship must have completed at least 140 quarter hours. Their transcript must be evaluated by the Allied Health Department before applying. It is suggested that students make an appointment for an evaluation at the beginning of the Junior year to assure that all of the requirements for the internship and graduation are fulfilled.

The University cannot guarantee admission into the fourth year of hospital clinical internship since it is on a restricted basis. Students are, therefore, encouraged to maintain a 3.0 overall G.P.A.

Students who qualify for the internship can pick up the list of hospital affiliations, application forms, and information regarding the internship in the Allied Health Department.

RESPIRATORY THERAPY TECHNOLOGY
Instructor Harris (Coordinator)

Respiratory Therapy is an allied health specialty concerned with the treatment management, control, diagnostic evaluation, and care of patients with deficiencies and abnormalities associated with the cardiopulmonary system. The respiratory therapist must be expert in the therapeutic use of such aids to the breathing process as medical gases, oxygen administration, humidification, aerosols, positive pressure ventilation, chest physiotherapy, cardiopulmonary resuscitation, and mechanical airways.

To effectively function as a specialized member of the health care team, the respiratory therapist must understand the physical and psychological needs of the patient, the doctor's goal in using respiratory therapy, and where and how the specialist's equipment and know-how fit into the treatment picture. The complexity of this responsibility requires the services of a highly trained, dedicated technologist.

The Allied Health Department has a program to help prepare students to meet the requirement for qualified, competent respiratory therapists. Theory and academic studies are presented in classroom and laboratory setup at Youngstown State University. Students gain clinical experience and practice theory by working in various area hospitals under the supervision of qualified instructors.

501. *Introduction to Respiratory Therapy.* The scope of the respiratory therapy field as a whole, the duties and responsibilities will be included. A discussion of important calculations for respiratory therapy with emphasis on specific applications current in medical practice. Hospital visits will be included. 3 q.h.

502. *Introduction to Respiratory Therapy Equipment.* An in-depth study of the apparatus utilized in providing respiratory care. Three hours lecture; three hours lab. 4 q.h.

503. *Respiratory Procedures I.* A discussion of the administration of oxygen and other therapeutic gases to include indications and contraindications. Discussion of aerosol, humidity and ultrasonic therapy, intermittent positive pressure breathing, and chest physiotherapy. Three hours lecture; three hours lab. Prereq.: MA 605. Must be taken concurrently with RT 504. 4 q.h.

504. *Clinical Practice I.* Practice in administering oxygen and other therapeutic gases on the patient by means of cannula, cathetic, and mask humidifiers by prefilled, disposable or permanent humidifiers. Clinical use of ultrasonic nebulizers, IPPB machines and chest physiotherapy. Maintenance and steri-

lization of equipment relating to the prevention of nosocomial infections. Thirty hours clinical. Must be taken concurrently with RT 503. 6 q.h.

601. *Respiratory Procedures II.* A study of the principles and practices of airway management, cardiopulmonary resuscitation, and emergency procedures. A discussion of manual resuscitators, airways and other equipment needed in management of patient airways. Three hours lecture; three hours lab. Prereq.: RT 503. 4 q.h.

602. *Clinical Practice II.* Emphasis on airway management, cardiopulmonary resuscitation and emergency procedures related to the apneic patient. Management of patients on mechanical ventilators with blood gas analysis. Maintenance of equipment used in these procedures. Twenty hours clinical. Must be taken concurrently with RT 601. 4 q.h.

603. *Pathology for Respiratory Therapy.* Types of inflammation. Pathology of respiratory and cardiovascular systems. Three hours lecture; three hours lab. Prereq.: Biol. 552 and Biol. 560. 4 q.h.

604 *Respiratory Procedures III.* Therapy using pressure and volume ventilation. Mental and emotional aspects of respiratory therapy. Three hours lecture; three hours lab. Prereq.: RT 601. 4 q.h.

605. *Clinical Practice III.* Operation and maintenance of pulmonary function equipment and the drawing and interpretation of arterial blood gases. Twenty-five hours clinical. Prereq.: RT 602. 5 q.h.

606. *Pulmonary Function and Blood Gas Analysis.* Ventilatory and respiratory insufficiency problems that can be diagnosed and evaluated by pulmonary function studies to include alveolararterial oxygen gradients and carbon monoxide diffusion studies. Evaluation of normal and abnormal acid-base balance through blood gas analysis. Three hours lecture; three hours laboratory. Prereq.: RT 601. 4 q.h.

607. *Clinical Practice IV.* Advanced studies of mechanical ventilation, pulmonary functions, blood gases, and adult and pediatric respiratory therapy. Twenty-five hours clinical. Prereq.: MA 680. RT 605. 5 q.h.

608. *Clinical Specialties.* Respiratory therapy applications in medical practice, including pathology, internal medicine, neurology, surgery, pediatrics and obstetrics. Emphasizing the role of the respiratory therapist as a member of the specialized health care team. Three hours lecture, three hours laboratory. 4 q.h.

RESPIRATORY THERAPY TECHNOLOGY CURRICULUM

FIRST YEAR

FIRST QUARTER	Hrs.
Biol. 551 Physiology and Anatomy of Man I	4
Chem. 502 Survey of Chemistry II	4
RT 501 Introduction to Respiratory Therapy	3
*Elective	4
	15

SECOND QUARTER	Hrs.
RT 502 Introduction to Respiratory Therapy Equipment	4
Biol. 552 Physiology and Anatomy of Man II	4
Chem. 503 Survey of Chemistry III	4
Biol. 560 Paramedical Microbiology	5
	17

THIRD QUARTER	Hrs.
Phys. 501 Fundamentals of Physics	4
MA 605 Introduction to Pharmacology	4
RT 503 Procedures I	4
MA 610 Patient Care for Paramedical Sciences	4
	16

FOURTH QUARTER (SUMMER)	Hrs.
RT 606 Pulmonary Function and Blood Gas Analysis	4
RT 601 Respiratory Procedures II	4
RT 504 Clinical Practice I	6
	14

SECOND YEAR

FIFTH QUARTER	Hrs.
RT 604 Respiratory Procedures III	4
RT 602 Clinical Practice II	4
RT 603 Pathology for Respiratory Therapy	4
Psych. 560 General Psychology	4
	16

SIXTH QUARTER	Hrs.
Engl. 550 Basic Composition I	4
RT 605 Clinical Practice III	5
RT 608 Clinical Specialties	4
MA 502 Law and Ethics	4
	17

SEVENTH QUARTER	Hrs.
Engl. 551 Basic Composition II	4

H&PE. 590 Health Education	3
Soc. 500 Fundamentals of Sociology	4
RT 607 Clinical Practice IV	5
	16
Total credit hours	**110**
Total Clinical Hours in Program	1000

*MA 501 is highly recommended.

ASSOCIATE IN ARTS

Students interested in a two-year degree in general education may receive the Associate in Arts degree by fulfilling the requirements listed below with a concentration in: business administration, business and secretarial, engineering and mathematical sciences, humanities, science or mathematics, or social studies.

DEGREE REQUIREMENTS

	Hrs.
English 550 and 551	8
Humanities	16
Science and Mathematics	12
Social Studies	16
H&PE 590	3
H&PE Activities	3
*Concentration	32
Electives	6-22
Total Credit Hours	96

*Must have a C or better in concentration area.

BUSINESS EDUCATION AND TECHNOLOGY

Associate Professor Boggess; Assistant Professors Hille, Phillips (chairman), Potts, Ratliff, Sebestyen, and Walton; Instructor Atkins.

The courses in Business Education and Technology are designed for students interested in careers in business and for education students desiring a comprehensive teaching field in business education.

The Business Education and Technology Department offers 10 two-year A.A.B. degree progrms —accounting technology, advertising technology, business management technology, court/conference reporting, graphics technology, marketing technology, public administration technology, real estate technology, secretarial studies and transportation management technology. Concentration areas are available for the secretarial studies major — office management, legal secretary, medical secretary and word processing.

Secretarial students who prefer to work in the allied health areas should follow the medical secretary concentration curriculum. The office management concentration is for students who are interested in office management careers. The word processing concentration is designed for students who want to work in a word processing center. For those students desiring to work in a law office or some affiliated profession, the legal secretary concentration is avaialble. Secretarial majors not choosing a concentration area will follow the two-year secretarial curriculum and select either technical or executive secretary as their specialization area. Students gain experience in the specialized area by taking BET 622, BET 731 and BET 805 concurrently in their area of specialization. The Medical and Legal block is offered during the winter quarter; Technical and Executive the spring quarter. A night block is rotated fall quarters. All secretarial students must take BET 510 during the first or second quarter.

Court/Conference Reporting majors must have an English ACT of 20. Those students having lower ACT's will be transferred to the Secretarial major until such time as they have an overall point average of 2.5 to transfer to the Court/Conference Reporting major. Court/Conference Reporting majors require a 3.0 point average in their major and a 2.5 overall average to meet graduation requirements.

Secretarial and Business Education majors scoring less than 18 on the English ACT must take BET 505 during the first or second quarter and those scoring less than 15 should also take Education 510. BET 505 or equivalent is a prerequisite for BET 704 and all shorthand classes.

After completing the two-year secretarial program, a student who wishes to complete a four-year education program may complete the requirements for a bachelor's degree in business education. Candidates for the Bachelor of Science in Education degree should consult the School of Education section of this catalog.

Students completing the two-year A.A.B. degree in all areas but Court/Conference Reporting can transfer to the four-year bachelor degree program in the School of Business Administration.

Grades of *C* or better are required in the major area for graduation. A course in the major in which a *D* or *F* was earned must be repeated before taking a course for which it is a prerequisite.

Certificate programs are offered in the areas of accounting technology, advertising technology, business management technology, clerk-stenographer, clerk-typist, court reporting, graphics technology, marketing technology, public administration technology, real estate technology, transportation management technology, and word processing. The certificate is awarded after completion of 45 hours of course work with a point average of 2.0 or higher and 60 hours of work experience.

Curriculum sheets for each area may be obtained from the Business Education and Technology Department or from advisors located in CAST 2068.

Business Education
Lower Division Courses

505. *Transcription Skills.* Designed to provide the student with transcription skills and proficiencies necessary for successfully completing the secretarial course of study. Emphasis is on business vocabulary, correct word usage, and letter punctuation techniques. Students taking this course must add four hours to degree requirements. 2 q.h.

506. *Word Processing Skills.* Extensive practice and applications in correct word usage, spelling, and punctuation. Transcription from tapes, belts, hardcopy, and rough drafts. Prereq.: BET 521 or equivalent. 3 q.h.

510. *Office Procedures.* Overview of employer expectations and requirements. Includes basic secretarial and clerical procedures; telephone techniques, behavioral problems, basic filing principles, use of reference material, and job application basics. Must be taken in first or second quarter of program. Prereq.: BET 520 or equivalent. 4 q.h.

513. *Business Machines I.* Use of common office calculating machines to solve typical business problems. Introduction to systems. One hour lecture, two hours laboratory. 2 q.h.

520. *Typewriting I.* The basic principles of touch typewriting. (This course is open to all students in the University. However, some majors must add two hours to their programs if they take this course.) One-hour lecture; three hours laboratory. This is a competency-based course. 2 q.h.

521. *Typewriting II.* Business letters, outlines, manuscript writing, technical papers, and business reports. One-hour lecture; three hours laboratory. Prereq.: BET 520 or equivalent. 2 q.h.

522. *Typewriting III.* Tables, business forms, and executive communications. One-hour lecture; two hours laboratory. Prereq.: BET 521 or equivalent. 2 q.h.

530. *Shorthand I.* The fundamental principles of the Gregg system of shorthand are presented. Prereq.: BET 505 or equivalent. 4 q.h.

532. *Machine Shorthand I.* Learning the theory of machine shorthand. Prereq.: BET 505 or equivalent. (F) 4 q.h.

534. *Alphabetic Shorthand I.* Principles of shorthand based on the English alphabet and development of a speed of 60 words a minute on business letters. Prereq.; BET 505 or equivalent and BET 520 or equivalent. (F) 4 q.h.

570. *Legal Terminology.* History and philosophy of legal terms used by the legal secretary, court administrator and law enforcement official. Meanings of common legal terms and their usage in legal correspondence, legal documents and court proceedings. (F) 3 q.h.

614. *Business Machines II.* Machine systems. Basic reprographics. One hour lecture; Two hours lab. Prereq.: BET 521. 2 q.h.

615. *Business Machines III.* Dictation, transcription, and automatic typewriters. Advanced reprographics and machine maintenance. One-hour lecture; two hours laboratory. Prereq.: BET 522. 2 q.h.

620. *Typewriting IV.* Advanced typing in professional offices. One-hour lecture; two hours laboratory. Prereq.: BET 522. 2 q.h.

621. *Typewriting V.* Specialized typewriting in the technical, medical, legal or executive office. Prereq.: BET 620. 2 q.h.

622. *Typewriting VI.* Advanced specialized typewriting in the technical, medical, legal or executive office. Prereq.: BET 620 or consent of instructor. 2 q.h.

630. *Shorthand II.* Beginning transcription and dictation. A dictation speed of 70 words a minute should be attained. Use of shorthand laboratory is required. Prereq.: BET 521 and 530, or equivalent. 4 q.h.

631. *Shorthand III.* Emphasis on dictation speed and transcription. A dictation speed of 90 words a minute should be attained. Use of shorthand laboratory is required. Prereq.: BET 630 or equivalent. 4 q.h.

632. *Machine Shorthand II.* Review theory with an emphasis on dictation speed and transcription. A speed of 70 words a minute should be attained. Prereq.: BET 521 and 532. (W) 4 q.h.

633. *Machine Shorthand III.* Emphasis on dictation speed and transcription. A dictation speed of 90 words a minute should be attained. Prereq.: BET 521 and 632. (Sp) 4 q.h.

640. *Concepts of Word Processing.* Fundamentals of word processing: feasibility study, equipment selection, center design, employee selection, training and motivation, inter-departmental relationships of work flow, and forms design and control. Prereq.: BET 510 or equivalent. 4 q.h.

641. *Magnetic Media.* Intensive study and operation of automatic keyboards in word processing centers. Recording, logging, proofreading, temporary and permanent revisions of word processing. Applications must be mastered on each piece of hardware. Prereq: BET 615. 3 q.h.

650. *Reprographics I.* Equipment usage, forms design, cost comparison, copy life, and quality of material. Prereq.: BET 522 and BET 641. 3 q.h.

690. *Court Reporting Practicum.* Supervised court room experience. Student will take testimony as recorded by court reporter and transcribe. One-hour seminar, 10 hours court room dictation per week. Prereq.: BET 734 and dictation proficiency of 225 wpm. 6 q.h.

Upper Division Courses

704. *Business Communications.* The study of business vocabulary, spelling, punctuation, and correct word usage needed in shorthand transcription. The mechanics, psychology, and principles of effective letter and report writing. Prereq.: BET 521 or equivalent. 4 q.h.

706. *Business Law.* The role of law in business. Basic fundamentals of business law designed to meet the needs of business education and secretarial students. 4 q.h.

710. *Introduction to Data Processing.* A study of the vocabulary and media of data processing. Problems in procedures and applications of basic current uses. Prereq.: Acctg. 605. (F, W, Sp, Su) 3 q.h.

718. *Word Processing.* Students organize and operate a word processing center utilizing previously acquired concepts and skills. Prereq.: BET 640 or equivalent. 4 q.h.

720. *Personal Relations in Business.* A study of the secretary in business; effectiveness as related to personality and to the concept of the fundamental purposes of business. Prereq.: Sophomore standing or permission. 4 q.h.

730. *Shorthand IV.* Emphasis is on dictation speed and transcription and refinement of transcription skills. A speed of 110 words a minute should be attained. Use of shorthand laboratory is required. Prereq.: BE&T 620, 631 or equivalent. 4 q.h.

731. *Specialized Dictation.* Dictation and transcription in specialized fields: law, medicine, etc. Includes machine transcription. Use of shorthand laboratory is required. Prereq.: BE&T 631, 615, and 620: or consent of instructor. 4 q.h.

732, 733, 734. *Machine Shorthand IV, V, VI.* Progression of development of machine shorthand theory, speed and transcription for competency in job entry level skills. Must be taken in sequence. Prereq.: BET 633. 4+4+4 q.h.

740. *Records Systems—Theory and Practices.* Fundamentals of records handling from creation to destruction. Includes information retrieval, retention and storage, correspondence control, records inventorying, reproduction and photocopying, directives and manuals, forms design and analysis, office layout and space utilization, and reports control. Prereq.: Sophomore standing. (W) 3 q.h.

805. *Office Practicum.* A terminal course for refinement of secretarial skills and techniques in simulated office procedures. Includes communication systems, records management, training and supervision problems, specialized typing and reports, and specialized secretarial functions. Prereq.: BET 615 and 620. 4 q.h.

810. *Techniques in Teaching Typewriting.* Includes demonstration and practice of techniques of teaching typewriting with emphasis on the psychology of skill development and currently accepted theories. Prereq.: Junior standing and BET 620. (Sp) 2 q.h.

820. *Techniques of Office Simulation Procedures.* Prepares students to teach in an office simulation environment. The student would participate in a simulation package. Prospective teachers gain insight into problems encountered by students during simulation exercises. Prereq.: Educ. 704. (Offered as needed) 4 q.h.

830. *Techniques of Teaching Shorthand.* Examines research in methods and techniques of teaching shorthand and its related areas. Includes techniques necessary for dictation and criteria for transcription evaluation. Prereq.: Junior standing, BET 620, and 631. 2 q.h.

831. *Alternate Shorthand Systems.* The fundamentals of Century 21, Notehand, and other kinds of shorthand and how they differ from Gregg shorthand. Intended for Business Education majors and graduate students. Prereq.: BET 830. 3 q.h.

850. *Intensive Office Education.* Analysis of the organization, implementation and evaluation of various vocational business and office education programs in secondary schools. Prereq.: Ed 706 3 q.h.

851. *Cooperative Office Education.* Organization, administration, and supervision of cooperative office education programs in the secondary school. Selection, instruction, placement, and evaluation of students. Prereq.: Ed. 706. (Offered as needed) 3 q.h.

860. *Principles and Problems of Business Education.* A study of the principles underlying the complete area of business education and its sub-areas, including such topics of study as nature, purposes, history and development, curriculum, educational levels, materials, equipment, standards, evaluation, guidance, public relations, job placement, administration and supervision, research, teacher qualifications, legislation, and cooperation with business. Prereq.: Educ. 704. 3 q.h.

Business Technology
Lower Division Courses

500. *Survey of American Business.* An outline of the nature and scope of American business with emphasis upon the needs of supervisory management personnel. Analysis of business formation and business management in general. Functional division of businesses and industry with discussions of legal, societal, and environmental factors related to overall operational success. 4 q.h.

501. *Introduction to Transportation.* A survey course of the development of all modes of transportation. Analysis of the role of transportation in the national and international economic development. (F) 4 q.h.

510. *Real Estate Principles and Practices I.* A survey which includes definitions, the legal aspects of real estate, financing responsibilities, the ethics of the profession and stresses knowledge of the Ohio license law, mathematics of real estate, mechanics of closing a sale. Background knowledge necessary to pass the Ohio real estate license exam. 3 q.h.

603. *Real Estate Brokerage.* Introduction to real estate practices, organizational operations, ethics, civic responsibilities, marketing functions, and economic impact. Prereq.: 510 or equivalent. 3 q.h.

604. *Real Estate Appraisal I.* The intricacies of real estate appraisals are studied with emphasis on the theory of value, the service orientation for real estate sales, and the general appraisal function as a tool relative to residential and commercial real estate sales and brokerage operations. 3 q.h.

605. *Real Estate Appraisal II.* Use of fundamental appraisal principles and the quantitative tools of appraisal analysis. Includes a summary introduction to the physical, legal, and economic characteristics of Real Estate. Meets both the SREA and the SRPA requirements for the 101 qualifying examination. Prereq.: 604 or permission of instructor. 3 q.h.

606. *Real Estate Appraisal III.* Principles and techniques of net income capitalization. Use and application of Mortgage-Equity or Ellwood techniques applicable for valuation and analysis of income-producing properties; use and application of currently-employed techniques and procedures for processing income forecasts into present worth estimates of both Market Value and Income Value. Meets SREA requirements for the 102 qualifying examination. Prereq.: BT 605 or permission of instructor. 3 q.h.

610. *Real Estate Law.* Study of the areas of law needed by real estate personnel; including the law of agency as applied to real estate brokers and salesmen, law of fixtures, estates (including leases), conveyancing of real estate, and license laws of the State of Ohio, zoning, cooperatives, and condominiums. 3 q.h.

620. *Special Topics in Real Estate.* Includes areas requiring specialized knowledge — taxation, investment analysis, industrial real estate, commercial real estate, and other types of income producing property. Current issues and problems such as the current real estate market, legislative activities, and long-range planning for the future of real estate are considered. Term paper required. Prereq.: 605. 3 q.h.

635. *Visual Presentation.* The theoretical and practical application of the principles involved in interior, industrial, and window display of various types of merchandise. Also studied is the importance of and placement of the display department in both a retail and industrial setting. The organization, functions, and management of display departments is also studied. Prereq.: Mktg. 624, Mktg. 625, and Adver. 632. 3 q.h.

All other courses included in the business technology curriculums are listed under other departments.

CURRICULUMS

The following curriculums lead to the Associate in Applied Business degree.

ACCOUNTING TECHNOLOGY

FIRST YEAR	Hrs.
BT 500 Survey of American Business	4
Eng. 550, 551 Basic Composition I and II	8
Acctg. 605, 606 Elementary Accounting I and II	10
[1]Math. 542 Applied Finite Mathematics	4
[2]Psych. 560 General Psychology	4
H & PE 590 Health Education	3
Mktg. 624 Fundamentals of Marketing	5
CPT 607 Business Programming I	4
Non-Technical Electives	6
	49

SECOND YEAR	Hrs.
Econ. 520, 621, 622 Principles of Economics I, II, III	10
Acctg. 701, 702 Intermediate Accounting I, II	10
Acctg. 713 Basic Cost Accounting	5
[3]Technical Electives	8
Fin. 720 Business Finance	4
Mgmt. 715 Business Law I	4
Mgmt. 725 Fundamentals of Management	4
Mgmt. 735 Comm. for Mgmt. & Bus	4
Electives (Bus. Administration)	3
	52
Total credit hours	**101**

ADVERTISING TECHNOLOGY

FIRST YEAR	Hrs.
BT 500 Survey of American Business	4
Engl. 550, 551 Basic Composition I and II	8
Adver. 631 Advertising Fundamentals	4
Adver. 632 Advertising Procedures	4
[1]Math. 542 Applied Finite Mathematics	5
[2]Psych. 560 General Psychology	4
H [9] PE 590 Health Education	3
Mktg. 624 Fundamentals of Marketing	5
Art 510 Color and Design I	4
Non-Technical Electives	9
	50

SECOND YEAR	Hrs.
Econ. 520, 621, 622 Principles of Economics I, II, III	10
Adv.[4]PR 710 Basic Public Relations	3
Adver. 725 Advertising Copywriting	4
Adver. 727 Advertising Layout	4
Adv. [4]PR 754 Media Presentation in Business	4
[3]Adver. Elective	3
Art 623, 624 Graphic Design I, II	6
Mktg. 625 Salesmanship	3
Speech 652 Business and Professional Speech	3
Mgmt. 715 Business Law I or Mgmt. 704 Legal Environment of Business	4
Acctg. 605 Elementary Accounting I	5
Elective (Bus. Administration)	3
	52
Total credit hours	**102**

[1]Math 531 or 502 may be substituted with Department Chairman's permission. Neither will transfer as credit for a four-year B.S. in B.A. degree. Students who take Finance 720 or Econ. 624 should take Math. 542.

[2]Psych. 505 may be substituted with Department Chairman's permission. It will not transfer as Psychology credit for a four-year B.S. in B.A. degree.

[3]Elective must be approved in advance by Department Chairman.

BUSINESS MANAGEMENT TECHNOLOGY

FIRST YEAR	Hrs.
500 Survey of American Business	4
Engl. 550, 551 Basic Composition I and II	8
[1]Math. 542 Applied Finite Mathematics	5
[2]Psych. 560 General Psychology	4
H & PE 590 Health Education	3
Mktg. 624 Fundamentals of Marketing	5
Acctg. 605, 606 Elementary Accounting I, II	10
[3]Computer Elective	4
Non-Technical Elective	6
	49

SECOND YEAR	Hrs.
Econ. 520, 621, 622 Principles of	

Economics I, II, III	10
Mgmt. 735 Comm. for Mgmt. & Bus.	4
Mgmt. 715 Business Law I or Mgmt. 704 Legal Environment of Bus.	4
Mgmt. 725 Fundamentals of Mgmt.	4
[3]BET 720 Personal Relations or Tech. Elective	4
Mgmt. 705 Principles of Transportation	4
Acctg. 713 Basic Cost Accounting	5
[3]Fin. 720 Business Finance or Bus. Admin. Elective	4
Fin. 722 Insurance Fundamentals or Fin. 730 Investment Analysis and Management	3
Speech 652 Business and Professional Speech	3
[3]Technical Electives	3
[3]Econ. 624 Economics and Social Statistics I or Elective	4
	52
Total credit hours	**101**

COURT/CONFERENCE REPORTING

FIRST YEAR	Hrs.
BET 510 Office Procedures	4
BET 521, 522 Typewriting I, II	4
BET 532, 632, 633 Machine Shorthand I, II, III	12
BET 570 Legal Terminology	3
Engl. 550, 551 Basic Composition	8
Political Sci. 601 American National Government	4
Crim. Justice 500 Intro. to Crim. Justice	4
MA 501 Medical Terminology	4
H & PE 590 Health Education	3
Science/Math	5
	51

SECOND YEAR	Hrs.
BET 620, 621, 622 Typewriting IV, V, VI	6
BET 690 Court Reporting Practicum	6
BET 704 Business Communications	4
BET 706 Business Law	4
BET 732, 733, 734 Machine Shorthand IV, V, VI	12
Crim. Justice 602 Crim. Judicial System	4
Crim. Justice 719 Criminal Law	4
Fin. 600 Personal Finance	3
Social Studies Electives	6
Elective (Real Estate OR Insurance)	3
	52
Total credit hours	**103**

GRAPHICS TECHNOLOGY

FIRST YEAR	Hrs.
Engl. 550, 551 Basic Composition I, II	8
Social Studies Electives	9
[2]Psych. 560 General Psychology	4
H & PE 590 Health Education	3
Art 510 Color and Design	4
Art 601 Drawing	3
Art 602 Drawing Techniques	3
Art 623 Graphic Design I	3
Art 624 Graphic Design II	3
Art 625 Graphic Design III	3
Adver. 631 Advertising Fund.	4
Adver. 632 Advertising Proc.	4
	51

[1]Math 531 or 502 may be substituted with Department Chairman's permission. Neither will transfer as credit for a four-year B.S. in B.A. degree. Students who take Finance 720 or Econ. 624 should take Math 542.

[2]Psych. 505 may be substituted with Department Chairman's permission. It will not transfer as Psychology credit for a four-year B.S. in B.A. degree.

[3]Elective must be approved in advance by Department Chairman.

SECOND YEAR	Hrs.
Math. 502 Algebra II or Math 531 Mathematics of Business	5
Art 612 Serigraphy	4
Art 705 Advanced Drawing	3
Art 716 Interior Design	3
Art 727 Graphic Design IV	3
Art 728 Graphic Design V	3
Art 729 Graphic Design VI	3
Art 780 Photography I	4
Adver. 725 Advertising Copywriting	4
Adver. 727 Advertising Layout	4
Mktg. 624 Fundamentals of Marketing	5
Mktg. 625 Salesmanship	3
Bus. Tech. 635 Visual Presentation	3
	47
Total credit hours	**98**

MARKETING TECHNOLOGY

FIRST YEAR	Hrs.
BT 500 Survey of American Business	4
Engl. 550, 551 Basic Composition I, II	8
[1]Math. 542 Applied Finite Mathematics	5
[2]Psych. 560 General Psychology	4
H & PE 590 Health Education	3
Mktg. 624 Fund. of Marketing	5
Adver. 631 Advertising Fundamentals	4

Adver. 632 Advertising Procedures	4
Geog. 519 Economic Geography	4
[3]Econ. 624 Economic and Social Statistics I or Bus. Admin. Elective	4
Non-Technical Elective	6
	51

SECOND YEAR	Hrs.
Econ. 520, 621, 622 Principles of Economics, I, II, III	10
BT 635 Visual Presentation	3
Mktg. 625 Salesmanship	3
Mktg. 709 Retail Marketing or Mktg. 720 Industrial Marketing	3
Mktg. 713 Retail Buying	4
Mktg. 726 Effective Consumer Motivation	4
Mktg. 731 Non-textiles or Mktg. 733 Furnishings	4
Speech 652 Business and Professional Speech	3
Acctg. 605, 606 Elementary Accounting I, II	10
Mgmt. 715 Business Law I or Mgmt. 704 Legal Environment of Bus.	4
[3]Elective (Marketing)	3
	51
Total credit hours	**102**

PUBLIC ADMINISTRATION TECHNOLOGY

FIRST YEAR	Hrs.
BT 500 Survey of American Business	4
Engl. 550, 551 Basic Composition	8
[1]Math. 542 Applied Finite Mathematics	5
[2]Psych. 560 General Psychology	4
H & PE Health Education	3
Political Sci. 600 Elements of Politics	3
Political Sci. 601 American National Government	4
Geog. 519 Economic Geography	4
Speech 652 Business and Professional Speech	3
Mktg. 624 Fundamentals of Marketing	5
Non-Technical Elective	6
	49

SECOND YEAR	Hrs.
Econ. 520, 621, 622 Principls of Economics I, II, III	10
Political Sci. 704 American Political Parties	3
Political Sci. 720 Public Admin.	3
Political Sci. 721 Urban Government	3
Political Sci. 722 State and Local Government	3
Mgmt. 715 Business Law I	4
Mgmt. 725 Fund. of Management	4
[3]BET 720 Personal Relations or Tech. Elective	4
Acctg. 605, 606 Elementary Accounting I and II	10
Fin. 720 Business Finance	4
Mgmt. 735 Comm. for Mgmt. & Bus.	4
	52
Total credit hours	**101**

[1]Math 531 or 502 may be substited with Department Chairman's permission. Neither will transfer as credit for a four-year B.S. in B.A. degree. Students who take Finance 720 or Econ. 624 should take Math 542.

[2]Psych. 505 may be substituted with Department Chairman's permission. It will not transfer as Psychology credit for a four-year B.S. in B.A. degree.

[3]Elective must be approved in advance by Department Chairman.

REAL ESTATE TECHNOLOGY

FIRST YEAR	Hrs.
English 550, 551 Basic Composition I, and II	8
Math 531 Mathematics of Business	5
[2]Psych. 560 General Psychology	4
H & PE 590 Health Education	3
BT 510 Real Estate Principles & Practices I	3
BT 610 Real Estate Law	3
BT 603 Real Estate Brokerage	3
Mktg. 625 Salesmanship	3
Mgmt. 715 Business Law I	4
Adver. 631 Advertising Fundamentals	4
Speech 652 Business and Professional Speech	3
Non-Technical Elective	7
	50

SECOND YEAR	Hrs.
Econ. 520, 621 Principles of Economics I, II	6
BT 604 Real Estate Appraisal I	3
BT 605 Real Estate Appraisal II	3
BT 606 Real Estate Appraisal III	3
BT 620 Special Topics in Real Estate	3
Mktg. 624 Fundamentals of Marketing	5
Fin. 717 Principles of Real Estate	3
Fin. 718 Real Estate Fin. & Problems	3
Acctg. 605, 606 Elementary Accounting I, II	10
Mgmt. 735 Comm. for Mgmt. & Bus. or BET 704 Bus. Communications	4
Fin. 722 Insurance Fundamentals	3

Mgmt. 725 Fundamentals of Mgmt.	4
	50
Total credit hours	**100**

SECRETARIAL STUDIES

FIRST YEAR	Hrs.
BET 510 Office Procedures	4
BET 521, 522 Typewriting	4
BET Shorthand	8
BET 513, 614 Business I, Business Machines II	4
Engl. 550, 551, Basic Composition	8
Math. 531 Mathematics of Business	5
H&PE 590 Health Education	3
Psych. 560 General Psychology	4
Social Science Electives	9
	49

SECOND YEAR	Hrs.
BET 615 Business Machines III	2
BET 620, 621, 622 Typewriting	6
BET 704 Business Communications	4
BET 706 Business Law	4
BET 710 Data Processing	3
BET 718 Word Processing	4
BET 720 Personal Relations	4
BET 730, 731 Shorthand	8
BET 805 Office Practicum	4
Acctg. 605 Elementary Accounting I	5
[4]Elective	4
	48
Total credit hours	**97**

LEGAL SECRETARY CONCENTRATION

FIRST YEAR	Hrs.
BET 510 Office Procedures	4
BET 522, 620 Typewriting	4
[5]BET 532, 632 Machine Shorthand	8
BET 570 Legal Terminology	3
BET 614, 615 Business Machines II, III	4
Accounting 604 Accounting for Professional Offices	5
Engl. 550, 551, Basic Composition	8
Criminal Justice 500 Introduction to Criminal Justice	4
Social Science 501, 503	6
H & PE 590 Health Education	3
	49

SECOND YEAR	Hrs.
BET 621, 622 Typewriting	4
[5]BET 633, 731 Shorthand	8
BET 704 Business Communications	4
BET 706 Business Law	4
BET 718 Word Processing	4
BET 720 Personal Relations	4
BET 805 Office Practicum	4
Psych. 560 General Psychology	4
Speech 652 Business & Professional	3
Criminal Justice 602 American Criminal Courts	4
Political Science Elective	3
Elective	6
	52
Total credit hours	**101**

[2]Psych. 505 may be substituted with Department Chairman's permission. It will not transfer as Psychology credit for a four-year B.S. in B.A. degree.

[4]Students who plan to complete a four-year program should add Accounting 606 and Management 511 as their electives. BET 622, 731, and 805 should be taken concurrently in area of specialization.

[5]Gregg shorthand may be substituted.

MEDICAL SECRETARY CONCENTRATION

FIRST YEAR	Hrs.
BET 510 Office Procedures	4
BET 521, 522, 620 Typewriting	6
BET 630 Shorthand II	4
M.A. 501 Medical Terminology	4
M.A. 502 Law and Ethics	4
English 550, 551 Basic Composition	8
H&PE 590 Health Education	3
H&PE 601 First Aid	3
Psych. 560 General Psychology	4
Social Science Electives	6
Non-Technical Elective	2
	48

SECOND YEAR	Hrs.
BET 614, 615 Business Machines II, III	4
BET 621, 622 Typewriting V, VI	4
BET 704 Business Communications	4
BET 710 Data Processing	3
BET 718 Word Processing	4
BET 720 Personal Relations	4
BET 731 Specialized Dictation	4
BET 805 Office Practicum	4
Acctg. 604 Accounting for Professional Offices	5
MA 600 Insurance Forms & Medical Records	3
MA 610 Paramedical Patient Care	4
History 699 History of Science and Medicine	4
Elective	2
	49
Total Credit Hours	**97**

[6]OFFICE MANAGEMENT CONCENTRATION

FIRST YEAR	Hrs.
BET 510 Office Procedures	4
[7]BET Typewriting	2
BET 615 Business Machines III	2

Engl. 550, 551 Basic Composition	8
Econ. 520 Intro. to Economics	3
Psych. 560 General Psychology	4
Soc. St./Science Electives	6
Math. 531 Mathematics of Business	5
H&PE 590 Health Education	3
Speech 652 Bus. & Prof. Speech	3
BT 500 Survey of Am. Business	4
Mktg. 624 Fund. of Marketing	5
	49

SECOND YEAR	Hrs.
BET 704 Business Communications	4
BET 706 Business Law	4
BET 710 Intro. to Data Processing	3
BET 718 Word Processing	4
BET 720 Personal Relations	4
BET 740 Records Systems	3
Acctg. 605 Elementary Accounting I	5
Acctg..606 Elementary Accounting II	5
Mgmt. 725 Fund. of Management	4
[3]Major Electives	12
	48
Total credit hours	**97**

WORD PROCESSING CONCENTRATION

FIRST YEAR	Hrs.
BET 510 Office Procedures	4
BET 521, 522, 620 Typewriting	6
BET 506 Word Processing Skills	3
BET 640 Concepts of Word Processing	4
BET 641 Magnetic Media	3
Engl. 550, 551 Basic Composition	8
Psych. 560 General Psychology	4
Social Science 501, 502	6
Math. 531 Mathematics of Business	5
Economics 520 Prin. of Econ. I	3
H&PE 590 Health Education	3
	49

SECOND YEAR	Hrs.
BET 621, 622 Typewriting	4
BET 614, 615 Business Machines II, III	4
BET 650 Reprographics I	3
BET 704 Business Communications	4
BET 710 Data Processing	3
BET 718 Word Processing	4
BET 720 Personal Relations	4
BET 731 Specialized Dictation	4
BET 740 Records Systems	4
BET 805 Office Practicum	4
Acctg. 605 Elementary I	5
Mgmt. 725 Fundamentals of Mgmt.	4
Mgmt. 726 Planning & Controlling	4
	50
Total credit hours	**99**

[3]Elective must be approved in advance by Department Chairman.

[6]Office management concentration prerequisites: Two years of high school typing or equivalent; one year of high school shorthand or equivalent.

[7]Student will take one typing course. The course will depend on previous typing background.

TRANSPORTATION MANAGEMENT TECHNOLOGY

FIRST YEAR	Hrs.
BT 501 Intro. to Transportation	4
Engl. 550, 551 Basic Composition I and II	8
[1]Math. 542 Applied Finite Mathematics	5
[2]Psych. 560 General Psychology	4
H & PE 590 Health Education	3
Econ. 520 Principles of Economics I	3
Mgmt. 605 Transportation Rates I	3
Mgmt. 606 Transportation Rates II	3
Mktg. 624 Fundamentals of Marketing	5
Speech 652 Business and Professional Speech	3
Non-Technical Electives	7
	48

SECOND YEAR	Hrs.
Econ. 621, 622 Principles I, II	7
Mgmt. 705 Principles of Transportation	4
Mgmt. 707 Commercial Motor Transportation	5
Mgmt. 746 Industrial Traffic Mgmt.	3
Mgmt. 725 Fund. of Management	4
Acctg. 605, 606 Elementary Accounting I and II	10
Econ. 624 Economics and Social Statistics I	4
Mgmt. 715 Business Law I	4
Mgmt. 735 Comm. for Mgmt. & Bus.	4
[3]BET 720 Personal Relations or Tech. Elective	4
Elective (Bus. Administration)	3
	52
Total credit hours	**100**

[1]Math. 531 or 502 may be substituted with Department Chairman's permission. Neither will transfer as credit for a four-year B.S. in B.A. degree. Students who take Finance 720 or Econ. 624 should take Math. 542.

[2]Psych. 505 may be substituted with Department Chairman's permission. It will not transfer as Psychology credit for a four-year B.S. in B.A. degree.

[3]Elective must be approved in advance by Department Chairman.

CHILD CARE TECHNOLOGY

See Home Economics.

COMMERCIAL ART TECHNOLOGY

See Graphics Technology under *Business Education and Technology.*

COMPUTER TECHNOLOGY

See Engineering Technology.

CRIMINAL JUSTICE

Associate Professors DeGarmo, Lateef and Swank; Assistant Professors Cummings (Chairman), Marshall, Pierce, Pilcher, and Stanko; Instructor Conser.

Youngstown State University offers three undergraduate academic programs in criminal justice: a two-year program in police science technology leading to the degree Associate in Applied Science; a four-year program in law enforcement administration leading to the degree Bachelor of Science in Applied Science; and a four-year program in corrections leading to the degree Bachelor of Science in Applied Science.

The department also offers a minor in three emphasis areas: general criminal justice, law enforcement administration and corrections.

A Graduate Program leading to the Master of Science degree in Criminal Justice with emphasis in police administration, correctional administration and program planning and evaluation is also available. Refer to the Graduate Catalog for details.

Associate in Applied Science Degree

The police science technology program is considered appropriate for persons preparing for employment in most municipal, state, and private law enforcement agencies. The program consists of 95 quarter hours, 44 of which are in the subjects listed below. Sixteen quarter hours of those taken in criminal justice must be taken at Youngstown State University. Students who have satisfactorily completed the police science technology program may enter the four-year program if they so desire. The police science technology curriculum is given below.

Bachelor of Science in Applied Science

The program in *law enforcement administration* is designed for persons preparing for employment in federal law enforcement agencies, administrative positions in municipal or state agencies, or as instructors in police education programs. The program in *corrections* is offered for students preparing for a career in probation, parole, or institutional services with either adults or juveniles.

All Bachelor of Science in Applied Science students are required to complete a minimum of 52 quarter hours of criminal justice courses, of which 20 quarter hours or more must be from the Upper Division courses listed below. Of the total hours taken in criminal justice, 20 quarter hours must be taken at Youngstown State University. The student shall also meet the general degree requirements for the Bachelor of Science in Applied Science degree as specified elsewhere in the catalog. Requirements for each program are as follows:

Departmental core requirements: 500, 601, 602, 603, 630, and 710.

Additional courses required for those majoring in law enforcement administration: 613, 614, 715, 719, and 870.

Additional courses required for those majoring in corrections: 701, 702, 703, and 707.

Additional courses may be elected by all majors within the department upon approval of the student's advisor.

Minor - a minor consisting of 21 hours must also be selected. The student is advised to consult the general catalog requirements for the minor and should consult with the departmental chairman in the selection of an appropriate area of study.

In addition to the requirement for a minimum of 45 hours of *C* or better in the major, a grade of *C* or better must be received in each *required* Criminal Justice course in order to satisfy the departmental requirement.

A one-year certificate in private security and public safety is available. Departmental advisor should be consulted for these requirements.

Lower Division Courses

500. *Introduction to Criminal Justice.* An overview of the American Criminal Justice process with emphasis upon its constitutional foundations, its constitutional limits, and the rights of the individual from arrest through sentencing and release. 4 q.h.

601. *Contemporary Law Enforcement.* The structure and function of modern police organizations are described in light of their role in a democratic society. Current dilemmas and integration of the police into the overall system of criminal justice are considered. Prereq.: 500 4 q.h.

602. *The American Criminal Courts.* The structure and function of the criminal courts in

American Society, perceptions of national commissions, organization, administration and caseflow relationships with appropriate social agencies. Prereq.: 500 or permission of the instructor. 4 q.h.

603. *Corrections in America.* Development of American correctional systems historically and philosophically, a description of the system, and constitutional foundations of its control, and the rights of those within it. An overview of treatment approaches. Prereq.: 500. 4 q.h.

613. *Criminal Investigation.* Legal and practical aspects of rules of evidence, physical evidence, interviews, surveillance, confidential informants, crime scene search, sources of information, and testifying and presentation of evidence in court. Prereq.: 500. 3 Q.H.

613L. *Criminal Investigation Practicum.* Demonstrations of crime scene investigation techniques such as: latent print development, photography, sketching, physical matching, and special emphasis on interviewing and interrogation. One three-hour lab a week. If taken as a requirement must be taken concurrently with 613. 1 q.h.

614. *Introduction to Criminalistics.* An introduction to the available means of identifying criminals through trace evidence with stress on the proper techniques for collection and preservation of trace evidence for crime laboratory analysis. Prereq.: 500 or permission of instructor. 3 q.h.

614L. *Introduction to Criminalistics Laboratory.* Demonstration of the examination of trace evidence such as body fluids, elementary toxicology, dangerous drugs, hairs, fibers, handwriting and number restoration, introduction to scientific instruments used in police work. Intended to acquaint students with the best utilization of the crime laboratory in criminal investigation. One three-hour lab a week. If taken for a requirement must be taken concurrently with 614. 1 q.h.

621. *Evidence.* Designed to familiarize the student with evidence used in criminal proceedings, the general rules governing the admissibility of evidence, the hearsay rule and its exceptions, opinion evidence, circumstantial evidence, documentary evidence, presumptions, corpus delicti, and evidentiary privileges. Prereq.: 500. 4 q.h.

622. *Criminal Procedure.* Legal and practical applications of the laws of arrest, criminal procedure, search and seizure, court structures and federal civil rights. Prereq.: 602. 4 q.h.

630. *Criminology.* Study of the social context of crime in American society including a review of historical theories offered in explanation of criminal behavior. Identical with Sociology 630. 4 q.h.

646. *Law Enforcement Techniques.* Legal and practical aspects of lineups and eyewitness identification, techniques, defensive tactics, police communications. Familiarization with firearms and chemical and non-lethal weapons. Prereq.: 601. 4 q.h.

648. *Introduction to Security.* Basic concepts in the private security surveys. Emphasizes the role of the private security officer. 4 q.h.

653. *Traffic Law and Investigation.* Study of traffic laws concerning operator licensing equipment requirements, and vehicle related offenses; legal considerations and enforcement philosophy; accident investigation techniques, reports and records; evaluation of accident problems and determining offenses involved. Prereq.: 613, 613L. 4 q.h.

665. *Human Relations in Criminal Justice.* Methods of coping with conflicts arising out of the intervention for law violations; improvement of understanding of public reactions to the enforcement of law; methods of helping people in conflict with each other; and programs for improving interpersonal relationships between police and the people they serve. Prereq.: Sociology 500 and Psych. 560. 4 q.h.

670. *Community Intervention Resources.* Community based resources which are designed to prevent, control, or rehabilitate the delinquent or adult offender. Prereq.: 500. 4 q.h.

Upper Division Courses

700. *Fire and Safety.* A general introduction to fire science, municipal, industrial and other fire protection services, fire detection and suppression systems, special emphasis on fire safety at industrial and commercial locations. 4 q.h.

701. *Probation and Parole.* An examination of the theory and practice of probation and parole with juvenile and adult offenders. Prereq.: Junior standing. (F,Sp) 4 q.h.

702. *Institutional Services in Corrections.* An examination of contemporary theory and practice in the administration of juvenile and

adult correctional institutions. Prereq.: Junior standing. (Sp) 4 q.h.

703. *Correctional Case Management.* The application of counseling and interviewing techniques and theory to the correctional client. Field and clinical situations are simulated so that the student can gain some experience in interviewing and report writing. Prereq.: Junior standing. 4 q.h.

707. *Criminal Justice Internship.* Observational and participating experiences in an appropriate criminal justice agency under the direction of experienced and qualified personnel. In addition there will be an orientation at the beginning of the quarter and one following during the last week of the quarter. Prereq.: Permission of instructor. 12 q.h.

710. *Social Statistics I.* Identical with Sociology 701. 4 q.h.

711. *Social Statistics II.* Identical with Sociology 702. 4 q.h.

712. *Criminal Justice Research.* An analysis of the major components of social research such as the selection of research design, sampling, measurement, data collection, analysis and interpretation of findings. Emphasis will be placed on topics related to criminal justice. 4 q.h.

715. *Criminal Justice Management Concepts.* An analysis of modern criminal justice management theory; organizational behavior, organizational development, personnel management, executive decision making, supervision problems. Prereq.: 601. 4 q.h.

719. *Criminal Law.* Development, theories, and purposes of criminal law; elements of a crime, parties to a crime. Prereq.: 602. 4 q.h.

735. *Juvenile Delinquency.* Social and psychological factors underlying delinquency; the juvenile court and probation; treatment and preventive measures. Identical with Sociology 735. Prereq.: Sociology 600 4 q.h.

748. *Commercial and Industrial Security.* Plant protection and industrial security; merchandising safety and security; credit and insurance investigative procedures. Prereq.: 648. 4 q.h.

749. *Driving, Intoxication and Drug Abuse.* Causes and effects of drug abuse, problems of law enforcement and dangers to public safety caused by drug abuse. Identifications, classication and characteristics of different types of drugs. Impact of drug abuse on American Criminal Justice system. Prereq.: 601. 4 q.h.

750. *Operational Intelligence.* Concepts and theory of intelligence functions in law enforcement; constitutional restrictions on intelligence-gathering devices; administration of intelligence operations. Prereq.: Criminal Justice 613. 4 q.h.

770. *Ohio Criminal Code.* Detailed examination of the Ohio Criminal Code regarding construction of criminal statutes, procedural rules, proof required for criminal charges, defenses, fundamental basis of criminal liability, the 11 degrees of offenses, uniform penalties, and criteria for imposing sentences. Prereq.: 719. 4 q.h.

775. *Contemporary Problems in Criminal Justice.* Lectures on selected topics dealing with contemporary issues in the criminal justice area. Specific topics will be announced prior to enrollment. Prereq.: Senior standing and permission of instructor. (F,Sp) 4 q.h.

776. *American Judicial Process.* Identical with Political Science 702. 3 q.h.

777. *American Constitutional Law.* Identical with Political Science 703. 3 q.h.

799. *Directed Individual Study.* The individual study or research of a special problem or issue related to the criminal justice field. Application must be made with the department prior to registration. May be repeated once for a maximum of five quarter hours credit. Prereq.: Senior standing, completion of 20 hours criminal justice courses and approval of instructor. 2-3 q.h.

820. *Prevention and Control of Deviant Behavior.* Crime and criminal behavior viewed as one of many forms of deviation from political, moral, and conduct norms of the majority culture. Study of forces that produce conformity and of the process whereby certain forms of conduct are officially proscribed and controlled through social intervention. Prereq.: 735. 4 q.h.

ENGINEERING TECHNOLOGY

Professors Richley (Chairman) and Crum; Associate Professors Barsch, Chrobak and Gardner; Assistant Professors Ciminero and Suchora; Instructor Tanik.

The Engineering Technology Department offers "TWO-PLUS-TWO" technical education programs in engineering and computer technology. Students in these programs may work toward a two-year associate degree or a four-year bachelor's degree as they prefer. The programs include both classroom and laboratory experiences which stress the

application of established engineering and computer knowledge and methods to the solution of problems. They include the study of the sciences and mathematics necessary to support a technology and study of the methods, processes, skills and materials used in that technology. The programs are designed to prepare graduates for a cluster of job opportunities in industry. Demands developed by an expanding technology place graduates of these programs in one of the fastest-growing occupational groups in the country.

Associate in Applied Science Degree

The department offers two-year technical education programs in:

Computer Technology

Civil Engineering Technology

Drafting and Design Technology

Electrical Engineering Technology

Mechanical Engineering Technology

Metallurgical Engineering Technology

Graduates of these programs are awarded the Associate in Applied Science degree and serve in industry as technicians.

Computer technicians serve as computer programmers, associate systems analysts or operators in both the business and scientific data processing fields. They may develop, code and maintain computer programs using one of several high-level computer languages. They assist in the design and development of business systems, computer models, and operating systems.

Engineering technicians function as aides or professional associates in the support of scientists and engineers. Their work concerns the design, drafting, development, testing, and production phases of engineering projects. Their tasks include laboratory testing, data gathering, and evaluation and instrument calibration. They may perform quality control tests, serve as technical sales representatives or serve as technical writers in the development of specifications or trade manuals.

825. *Constitutional Issues in Criminal Law.* Examination in depth of the constitutional foundations of the American criminal justice process with special emphasis upon recent Supreme Court decisions, state and federal legislation affecting criminal law. (W) 4 q.h.

826. *Forensic Science and the Criminal Justice System.* A review of the impact of forensic science on the criminal justice system, discussion of future applications, constitutional considerations and the significance of physical evidence. Emphasis is given to management responsibilities with respect to the ciminalistics laboratory. Prereq.: Senior standing. 4 q.h.

836. *Theory of Criminal Behavior.* An analysis of theory and research on epidemiology and etiology of crime. Prereq.: 630. 4 q.h.

870. *Law Enforcement Administration.* Detailed examination of the administration of line and staff services of law enforcement agencies and the role of technology in administration. Prereq.: 715. (F) 4 q.h.

875. *The Juvenile Justice System.* An in-depth analysis of the specialized agencies and procedures developed to deal with problems of juveniles from a historical and philosophical perspective. Consideration is given to the juvenile court, community based programs, as well as institutionalization. Prereq.: Senior standing. 4 q.h.

POLICE SCIENCE TECHNOLOGY CURRICULUM

DEPARTMENTAL REQUIREMENTS	Q.H.
500 Introduction to Criminal Justice	4
601 Contemporary Law Enforcement	4
602 American Criminal Courts	4
613 Criminal Investigation	3
613L Criminal Investigation Lab	1
614 Introduction to Criminalistics	3
614L Introduction to Criminalistics Lab	1
622 Criminal Procedure	4
653 Traffic Law and Investigation	4
665 Human Relations	4
719 Criminal Law	4
Any two Criminal Justice electives	8
Minimum Required Hours	**44**

GENERAL DEGREE REQUIREMENTS	Q.H.
English:	
550 Basic Composition I	4
Health and Physical Education:	
590 Health Education	3
601 Safety and First Aid	3
Social Studies:	
Electives in two or more of the following departments: Economics, Geography, History, Political Science (including the Social Science sequence courses), Psychology, Sociology, and Black Studies	16
Science:	
Astronomy, Biology, Chemistry,	

Geology or Physics	8
Other:	
*BET 520 Typing I	2
Electives	15
Total Credit Hours	95

*If taken in high school, waived; but two hours must be added to general elective requirements.

DENTAL HYGIENE TECHNOLOGY
See Allied Health.

The Civil, Electrical and Mechanical Technology Associate Programs are accredited by the Engineers' Council for Professional Development. Graduates of these programs qualify for immediate certification, without examination, as "Junior Engineering Technicians" by the Institute for the Certification of Engineering Technicians. Such certification in turn qualifies graduates for membership in the American Society of Certified Engineering Technicians.

Drafting and design graduates work with engineers, architects, and technicians in converting ideas, designs, and sketches into workable plans and specifications. Plans and specifications, the language of industry, serve as a base from which building structures, machinery, and products are produced.

Bachelor of Science in Applied Science Degree

The civil, computer, electrical and mechanical engineering technology programs are based on the "TWO-PLUS-TWO" educational system which provides the student with the flexibility of earning an associate degree or a bachelor's degree according to the student's needs. After completing the requirements of the two-year associate degree, the student may elect to enter industry, or through an added two years of part-time or full-time study, earn the degree Bachelor of Science in Applied Science. The student will then have increased career potential to that of an engineering technologist or computer systems analyst.

In some instances technologists are directed by engineering professionals, but frequently those assigned to production work independently. They may develop specifications for materials and methods, serve as production supervisors, or serve as liaison among development, engineering, and production departments. Tasks related to the installation, operation, and maintenance of production machinery are often supervised by technology graduates.

Based on an evaluation of their work, transfer students who have earned a related associate degree from a regionally accredited institution will be admitted to the bachelor's degree program at the junior level.

For the associate degree, *C* or better grades must be earned in at least 32 q.h. of major area coursework.

Certificate Programs

Certificate programs are available in:

Architectural and Construction Technology

Architectural/Mechanical Drafting Technology

Computer Technology

Electrical Power

Electronics

General Industrial Technology

Machine Design

Plant Engineering Technology

Tool Design

Urban Planning Technology

The programs are approximately one academic year in length (45 q.h.) and designed to provide a concentration of technical knowledge in a specific area. Details on these programs are available at the departmental office.

Prospective engineering technology students are urged to enroll in ET 505 course. It attempts to acquaint students with the nature of this career area, and therefore will assist prospective students in determining the level of their interest. ET 505 is required of all engineering technology majors.

ET 505. *Elements of Engineering Technology.* A course designed to set the tone for the student's academic and technical career. The course concerns the role of the technician, technologist, and their relationship to the engineer; the development of technical methods as they apply to analysis, design, layout, testing, and fabrication; a study of the basic mathematical, scientific, and communicative techniques as they apply to the work of engineering techncians. 4 q.h.

ET 615. *Design project.* Student will undertake a project designed to utilize principal methods studied in previous courses. The subject of the project will be jointly determined by the student and instructor and formally developed by the student. The course is normally taken during the final stages of the student's program. Prereq.: Consent of instructor. 4 q.h.

Civil Engineering Technology

Professor Crum (Program Coordinator)

The civil engineering technology program is developed on the "TWO-PLUS-TWO" system. Students may choose to terminate their formal education after completing two years of study and earning the Associate in Applied Science degree, or they may continue full- or part-time to a bachelor's degree.

Associate Degree Program

The associate degree program prepares technicians to support civil engineers in structural design, public works, construction, transportation and environmental engineering. Most graduates are hired by governmental agencies, consulting engineers, architects and contractors.

Bachelor's Degree Program

The bachelor's program in civil engineering technology allows a student to increase their potential to that of an engineering technologist and broaden in several technical and non-technical areas. The student can also concentrate in urban planning, architecture, and construction, or transportation as interests dictate. The program is regionally accredited and therefore is applicable towards the total academic and experience requirements for certification.

604. *Properties and Strength of Materials.* Introduction to the physical and chemical structures of materials and their relationship to the behavior of materials under load. Introduction to the concepts of stress and strain. Instruction in use and care of testing equipment and standard tests. Methods of data retrieval and reduction and report preparation. Three hours of lecture, three hours of laboratory per week. Prereq.: MET 515, Chem. 501. (F, S) 4 q.h.

607. *Solid Mechanics.* Elementary theory in resistance of solids to external loading. Relationships among load, deformation, stress and strain in tension, compression, torsion, and bending. Physical demonstration and verification of theories. Prereq. CET 604. (F, W) 4 q.h.

610. *Structural Analysis.* Fundamental and systematic determination of loads and deflections in beams, frames, trusses, and arches. Influence diagrams. Energy relations in structural systems. Practice in analysis of existing structures in area. Prereq. or concurrently: CET 607.(W) 4 q.h.

612. *Structural Design and Drafting.* Design methods in wood, concrete, and steel. Familiarization with AISC, ACI, CRSI, SJI, and other national and local codes. Selection of members and connections in accordance with specifications. Drafting of simple members, connections, elementary, and more complex structures. Design and drafting thesis required. Two hours lecture, four hours laboratory per week. Prereq.: CET 610 (Sp) 4 q.h.

615. *Soil Mechanics.* Study of the properties of soils, soil classification, soil strength, bearing capacity, consolidation, and compressibility. Seepage and frost action. Principles and procedures of soil testing. Laboratory practice in soil identification and soil properties. Three hours lecture, three hours laboratory per week. Prereq.: CET 604 (W) 4 q.h.

617. *Construction Methods and Materials.* Methods and planning of construction, estimating, and scheduling materials, equipment, and labor. Understanding steel, wood, concrete, asphalt, and composites as construction materials. Laboratory demonstrations of development and testing of individual construction materials and structural composites as roofing, insulation, masonry, etc. Familiarization with building codes. Relationship between architect and engineer. Three hours lecture, three hours laboratory per week. Prereq.: CET 604. (F) 4 q.h.

622. *Advanced Surveying.* Precise surveying instruments and practice. Land and city surveying. Plane coordinate systems in cadastral surveying. Topographic mapping. Prereq.: CE 710. 3 q.h.

622L. *Advanced Surveying Laboratory.* Practice in use of precise instruments in surveying and mapping. Three hours of laboratory per week. Taken concurrently with CET 622. 1 q.h.

624. *Environmental Analysis.* Introduction to analysis of problems in public works. Elements of water supply and waste management and their impact on land use planning. Analysis of water distribution systems, drainage systems and waste water treatment processes, including the impact of governmental regulations. Prereq.: MET 615, Chem. 501 (Sp) 4 q.h.

712. *Architectural Technology I.* Emphasis on overall planning and layout techniques. Techniques of reading building and plot plans. Studies of the relationships among the

planner, architect, engineer, constructor, owner and pertinent public agencies or governments. Architectural design projects. Two hours lecture, four hours laboratory per week. Prereq.: CET 617 or consent of instructor. 4 q.h.

724. *Public Works Technology.* A first course in technological aspects of public works emphasizing overall environmental design. Simplified technical solutions to problems involving man in modern society. Emphasis on the accountability of public works agencies to society in terms of providing of services and mobility. Natural resources and waste management will be heavily emphasized. Prereq.: CET 624. 4 q.h.

730. *Transportation Technology.* Application of knowledge in construction materials, soil mechanics, structural technology and environmental analysis towards support of the transportation engineer and planner. Office procedures in route planning. Procedures in sub-surface preparation, control and inspection. Emphasis on the ecological and social impact of transportation routes. Guest lectures by highway/transportation experts. Field trips to office and field sites. Prereq.: CET 624. 4 q.h.

800. *Building Systems.* An integrated course reflecting the relationship between the environmental and structural systems of building structures. Included are water supply and drainage systems, sanitary systems, heating and air conditioning systems, electrical and electronic systems, lighting and sound systems, transportation systems and security systems. Three hours lecture, three hours laboratory per week. Prereq.: EET 501. 4 q.h.

812. *Concrete Design Techniques.* Practical design techniques in concrete. Fundamental design and layout techniques of plain and reinforced concrete foundations, reinforced and post-tensioned concrete beams, concrete block and reinforced concrete wall structures and retaining walls. Six hours lecture and design lab per week. Prereq.: CET 612. 4 q.h.

817. *Construction Management.* A continuation of CET 617 with emphasis on planning, estimating and scheduling. Discussions of contracts and specifications. Relationships among architect, builder, engineer and owner. The course will include field trips to office and field sites to observe the duties of technologists and supervisors in construction. Prereq.: CET 617. 4 q.h.

ASSOCIATE DEGREE

FIRST YEAR

FIRST QUARTER	Hrs.
Math. 502 Algebra II	5
Social Studies Elective	4
ET 505 Elements of Engineering Technology	4
Chem. 501 Survey of Chemistry	4
Chem. 510 Survey of Chemistry Lab	1
	18

SECOND QUARTER	Hrs.
Math. 503 Trigonometry	5
English 550 Basic Comp. I	4
ME 501 Eng. Drawing	3
MET 515 Mechanics I	4
	16

THIRD QUARTER	Hrs.
Math. 570 Applied Math. I	5
MET 516 Mechanics I	4
CET 604 Properties & Strength of Materials	4
Social Science 502 Introduction to Economics	3
	16

SECOND YEAR

FOURTH QUARTER	Hrs.
MET 615 Fluid Mechanics	4
CET 607 Solid Mechanics	4
CET 617 Construction Methods and Materials	4
CE 710 Surveying I	5
	17

FIFTH QUARTER	Hrs.
CET 610 Structural Analysis	4
CET 615 Soil Mechanics	4
Speech 652 Business & Professional Speech	3
H&PE 590 Health Education	3
Phys. 502 Fundamentals of Physics II	3
Phys. 502L Fundamentals of Physics II Lab	1
	18

SIXTH QUARTER	Hrs.
Social Studies elective	3
CET 612 Structural Design and Drafting	4
CET 624 Environmental Analysis	4
CE 711 Surveying II	4
	15
Total Credit hours	**100**

*Social Studies elective—A comprehensive series, Social Science 501, 502, and 503 may be

chosen or select social science courses from geography, history, political science, psychology, sociology or social science.

THIRD YEAR SEVENTH QUARTER	Hrs.
Engl. 551 Basic Comp. II	4
Math. 670 Applied Math. II	4
CPT 601 Scientific Prog. I	4
CET 712 Architectural Technology	4
H&PE Activity Course	1
	17

EIGHTH QUARTER	Hrs.
Humanities elective	4
Math. 770 Applied Math. III	4
EET 501/501L Circuits I	4
CET 724 Public Works Technology	4
	16

NINTH QUARTER	Hrs.
Econ. 624 Economics & Social Statistics I	4
Science Elective (Non-Math.)	4
MET 700 Physical Measurements	4
CET 730 Transportation Technology	4
H&PE Activity Course	1
	17

FOURTH YEAR TENTH QUARTER	Hrs.
Geog. 805 Geog. of Environmental Plan	3
Mgmt. 725 Fundamentals of Management	4
Elective	4
CET 800 Buildings Systems	4
H&PE Activity Course	1
	16

ELEVENTH QUARTER	Hrs.
Engineering Technology elective	4
Mgmt. 715 Business Law	4
Elective	4
Geog. 808 Land Use & Transportation	4
	16

TWELFTH QUARTER	Hrs.
Humanities Elective	4
Fin. 717 Real Estate Principles or Geog. 809 City & Regional Planning	3 or 4
Elective	4
CET 817 Construction Management	4
	15 or 15
Total credit hours	**197 or 198**

Computer Technology

Associate Professor Chrobak (Program Coordinator): Instructor Tanik.

The computer technology program is based on the "TWO-PLUS-TWO" concept. This provides the student the opportunity to earn a two-year Associate in Appplied Science degree, and then if desired, to continue for two more years of study toward the Bachelor of Science in Applied Science degree.

Associate Degree Program

The Associate degree program produces a graduate skilled to meet the needs of the electronic data-processing industry. Most graduates are employed as programmers or operators in computer centers related to business or science.

Bachelor's Degree Program

Students completing the associate degree program may elect to complete an additional two years on either a full- or part-time basis. Students then are awarded the Bachelor of Science in Applied Science degree and are prepared to function as systems analysts in industry. Students may take a business or science option in computer technology courses depending on their interest.

500. *Data Processing Concepts.* A survey of the computer-oriented data processing system. The student will be exposed to computer equipment, and will study principles and applications of computing techniques including a programming language. Computer programs will be prepared and computer-processed. (F,W) 4 q.h.

502. *Computer Concepts.* Basic data representation, Hollerith, binary coded decimal systems; development of computer systems, description of basic component operations, arithmetic units, storage media. Input-output devices; methods of flow charting; use of decision tables. (W) 3 q.h.

510. *Introduction to Computers and Computer Applications.* An introductory course providing an overview of practical applications of computers. Based on the BCS telecourse "MAKING IT COUNT." Discusses hardware and software, operating systems, multiprogramming and processing, system analysis applications, use of computing power and uses in decision making. Educational media including home television, and/or, University-based video cassette lessons, and student-teacher lecture sessions. 2 q.h.

601. *Scientific Programming I.* An introductory course in computer programming using the science-oriented language known as FORTRAN. Applications of FORTRAN to fundamental problems in science, engineering and business. Three hours of lecture and three hours of programming laboratory per week. Prereq.: Math. 502 or consent of instructor 4 q.h.

602. *Scientific Programming II.* A continuation of CPT 601 stressing the application of FORTRAN to advanced problems in science, engineering, and business. Fundamental numerical techniques applied to problem solving. Prereq.: CPT 601, Math. 570. (W) 4 q.h.

603. *Scientific Programming III.* A continuation of CPT 602 stressing the application of FORTRAN to higher level problems in science and engineering. Three hours lecture and three hours of programming laboratory per week. Prereq.: CPT 602 or consent of instructor. 4 q.h.

607. *Business I.* An introductory course in computer programming using the business-oriented language known as COBOL. The history of languages, flow charting, and the use of COBOL in basic commercial applications. Three hours of lecture and three hours of programming laboratory per week. Prereq.: 502 or consent of instructor. 4 q.h.

608. *Business Programming II.* The application of COBOL language to the solution of advanced problems in business. Techniques of programming using mass storage devices. Prereq.: CPT 607 or consent of instructor, (F) 4 q.h.

611. *Programming S/360 Assembler.* This cn77niques, programming exercises, and case course includes the use of the assembler language in writing, testing and running of programs on this computer system. Three hours lecture and three hours of laboratory per week. Prereq.: CPT 601 or CPT 607. 4 q.h.

612. *Programming-PL/1.* Detailed study of the PL/1 language; analysis of its facilities will be made to demonstrate specific applicability to engineering, mathematical, and commercial problems. Several class problems will be coded to reinforce efficient coding techniques. Three hours lecture and three hours laboratory per week. Prereq.: CPT 601, CPT 611. (W) 4 q.h.

613. *Programming-RPG.* A detailed study of the Report Program Generator (RPG) language. Applications programs ranging from card-to-printer listings to updating of master files will be prepared for use with card, tape and disk systems. Prereq.: CPT 607 or consent of instructor. (F) 4 q.h.

614. *Business Systems and Procedures.* Study of methods of anlysis and evaluation of information flow, development of operating systems including forms design, use of equipment, and employee training. Prereq.: Acctg. 605, CPT 611. (Sp) 3 q.h.

616. *Operating Systems.* Study of advanced programming; operating systems including translators, compilers, high level language processing, batch processing, real time processing, and multiprogramming. Prereq.: CPT 601 or consent of instructor. (W) 3 q.h.

618. *Data Processing Application.* This course is designed to acquaint the student with business data processing applications. Practical case studies include payroll, accounts payable, budget control, inventory control, production control, etc. Three hours of lecture and three hours of laboratory per week. Prereq.: CPT 614. (Sp) 4 q.h.

622. *Utility Programs.* A course designed to familiarize the student with general purpose programs found in computer installations. These include sort-merge routines, report generators, magnetic tape routines, supervisory routines, and random access utility programs. Prereq.: CPT 611. (Sp) 4 q.h.

701. *Scientific Programming Applications.* Use of computers to solve basic technical problems in the areas of electrical, chemical, structural, and mechanical design. Three hours lecture and three hours of programming laboratory per week. Prereq.: CPT 601, Math. 570 or equivalent. (F) 4 q.h.

711. *Advanced Assembler Programming.* Advanced symbolic programming techniques, programming exercises, and case studies to familiarize the student with actual programming practices. Prereq.: CPT 611. (F) 4 q.h.

716. *Advanced Operating Systems.* An advanced study of operating systems with emphasis on systems generation, control languages, time-sharing, and multiprogramming. Prereq.: CPT 616. (W) 4 q.h.

720. *Telecommunications.* Principles behind the different types of data transmission hardware and techniques with communication links in time-sharing and real-

time systems. Prereq.: CPT 611 or consent of instructor. (Sp) 4 q.h.

802. *Programming of Numerical Techniques.* Numerical methods used in solutions to mathematical equations pertaining to engineering applications and analysis of tabulated data. Specified problems consisting of error analysis, evaluation of determinants and matrices, and differentiation techniques. Prereq.: CPT 701 or consent of instructor. (W) 4 q.h.

804. *Programming in Operations Research Applications.* Study of basic operations research techniques and the programming of these techniques. Topics included are linear programming, queuing, mathematical modeling and network analysis. Prereq.: CPT 802. (Sp) 4 q.h.

814. *Advanced Business Systems and Procedures.* Processing of data in an integrated management information system environment with emphasis on the source, flow, dissemination, and interrelationship of data required for various operational areas of an industrial organization. Prereq.: CPT 614. (W) 4 q.h.

818. *Development of Data Bases.* Study of the basic structure, design, development, implementation, and modification of data bases for use in management information systems. Prereq.: CPT 618. (Sp) 4 q.h.

820. *Computer Center Operations.* Study of the organization of a computer center operation, machine selection and layout, scheduling; training and supervision of personnel; development of program descriptions and establishment of program standards. Prereq.: CPT 720. (Sp) 4 q.h.

Associate Degree Program

FIRST YEAR

FIRST QUARTER	Hrs.
Math. 502 Algebra II	5
Eng. 550 Basic Comp. I	4
Social Studies elective*	3
CPT 500 Data Processing Concepts	4
	16

SECOND QUARTER	Hrs.
Math. 503 Trigonometry	5
Speech 652 Business and Professional Speech	3
Soc. Sci. 502 Intro. to Econ.	3
CPT 502 Computer Concepts	3
H&PE 590 Health Education	3
	17

THIRD QUARTER	Hrs.
Math. 570 Applied Math. I	5
Acctg. 605 Elem. Acctg. I	5
Social Studies elective*	3
CPT 607 Bus. Prog. I	4
	17

SECOND YEAR

FOURTH QUARTER	Hrs.
Physics 501 Fund. of Physics	4
CPT 601 Scientific Prog. I	4
CPT 608 Bus. Prog. II	4
CPT 613 Programming-RPG	4
	16

FIFTH QUARTER	Hrs.
Physics 502 Fund. of Physics/Lab.	4
CPT 602 Scientific Prog. II	4
CPT 611 Prog. S 360 Assembler	4
CPT 616 Operating Systems	3
	15

SIXTH QUARTER	Hrs.
Free elective	4
CPT 614 Bus. Systems and Proc.	3
CPT 618 Data Processing Application	4
CPT 622 Utility Programs	4
	15

Total Credit Hours **96**

*Social Studies elective—Social Science 501 and 503 recommended. May select course from geography, history, political science, psychology or sociology.

Bachelor's Degree Program

THIRD YEAR

SEVENTH QUARTER	Hrs.
Math. 670 Applied Math. II	4
Acctg. 606 Elementary Accounting II	5
Engl. 551 Basic Composition II	4
CPT 711 Advanced Assembler Programming	4
	17

EIGHTH QUARTER	Hrs.
Phil. 619 Introduction to Logic	5
Mgmt. 725 Fundamentals of Management	4
Science Elective (Non-Math)	4
CPT 716 Advanced Operating Systems	4
	17

NINTH QUARTER	Hrs.
Acctg. 713 Basic Cost Accounting or Math. 770 Applied Math. III	4-5
Mgmt. 735 Communication for Manage-	

ment and Business or IE 705 Value Engineering	4
Elective (Social Studies 700-Level)	4
CPT 720 Telecommunications	4
	16-17

FOURTH YEAR TENTH QUARTER	Hrs.
Free Elective*	4
Econ. 624 Economics and Social Statistics I	4
Social Studies Elective	3
H&PE Activity Course	1
CPT Option Course	4
	16

ELEVENTH QUARTER	Hrs.
Phil. 703 Symbolic Logic	5
Mgmt. 789 Production Mgt.	4
H&PE Activity Course	1
CPT Option Course	4
	14

TWELFTH QUARTER	Hrs.
Mgmt. 820 Production Control	4
Free elective*	4
H&PE Activity Course	1
CPT 820 Computer Center Operations	4
CPT Option Course	4
	17
Total Credit Hours	**193 or 194**

*Free elective—Should be selected as to complete a minor (21 q.h. of C or better) in mathematics, accounting or management.

Select all option courses from one option only.

CPT Option Courses—3 To Take Business Option	Hrs.
CS 700 Data Structure	4
CPT 818 Development of Data Bases	4
CPT 814 Advanced Business Systems and Procedures	4

NOTE: Business option students must take Acctg. 713 & Mgt 735

Science option	Hrs.
CPT 701 Scientific Programming Applications	4
CPT 802 Programming of Numerical Techniques	4
CPT 804 Programming in Operations Research	4

NOTE: Science option students must take Math. 770 & IE 705

Drafting and Design Technology

This program prepares students to function as "design draftsmen" in either the mechanical or civil-architectural fields. They study design (the determination of size, form, and clearance) and drafting (the conversion of ideas, sketches, and specifications into plans). They are also acquainted with cost and materials estimating and specifications writing. Graduates earn the associate degree and are employed in industries relating to the fabrication and production of building structures and metal products. Graduates interested in further education should consider the "TWO-PLUS-TWO" bachelor's degree in civil or mechanical engineering technology.

602. *Civil and Architectural Drafting.* Practice in drafting associated with overall environmental designs such as land surveys, highways and plot plans. Architectural symbols foundations and floor, wall and roof systems. Six hours of combined lecture and laboratory per week. Prereq.: ME 501. 3 q.h.

603. *Systems Drafting.* A study of the basic principles and drafting techniques used to represent electrical, hydraulic and pneumatic systems. Symbolic representation of circuit components is stressed. Six hours of combined lecture and laboratory per week. Prereq.: ME 501. 3 q.h.

608. *Machine Elements.* Design and drafting of machine elements common to mechanical equipment. Drafting and the use of handbooks and catalogs will be stressed. Three hours lecture and three hours laboratory per week. Prereq.: CET 607. 4 q.h.

611. *Specifications and Estimating.* A course involving the fundamentals of specifications writing, cost estimating and material requirements estimating. Prereq.: CET 617, MET 630, or consent of instructor. 4 q.h.

613. *Building Systems Drafting.* Practice in layout and drafting of structural, electrical and mechanical systems of buildings. Attention is also given to the control and interrelationship of these systems. One and one-half hours lecture. Four and one-half hours laboratory. Prereq.: DD 603. 3 q.h.

Associate Degree Program

FIRST YEAR FIRST QUARTER	Hrs.
ME 501 Engineering Drawing	3
ET 505 Elements of Engr. Technology	4
Math. 502 Algebra II	5

Social Studies elective*	3
	15

SECOND QUARTER	Hrs.
MET 515 Mechanics I	4
Eng. 550 Basic Comp I	4
Math. 503 Trigonometry	5
ME 504 Graph Sci. & Design	4
	17

THIRD QUARTER	Hrs.
Art 602 Drawing Techniques	3
Speech 652 Business & Professional Speech	3
DD 602 Civil & Architectural Drafting	3
CET 604 Prop/ Strength of Materials	4
H&PE 590 Health Education	3
	16

SECOND YEAR

FOURTH QUARTER	Hrs.
MET 630 Manufacturing Processes	4
Social Studies elective*	3
CET 617 Construction Methods and Materials	4
CET 707 Solid Mechanics	4
	15

FIFTH QUARTER	Hrs.
DD 608 Machine Elements	4
DD 611 Specifications & Estimating	4
MET 550 Advanced Drawing	4
Social Studies elective	3
DD 603 Systems Drafting	3
	18

SIXTH QUARTER	Hrs.
DD 613 Building Systems Drafting	3
ET 615 Design Project	4
CET 612 Structural Design and Drafting	4
MET 620 Tool Design	3
Science elective	4
	18
Total Credit Hours	**99**

*Social Studies Elective — Select one course from any three of Geography, History, Political Science, Psychology, Sociology, Social Science or Economics.

Electrical Engineering Technology

Professor Richley; Associate Professor Gardner (Program Coordinator), Assistant Professor Ciminero.

The electrical engineering technology program is based on the "TWO-PLUS-TWO" concept. This provides the student the opportunity to pursue two years of full-time study leading to the Associate in Applied Science degree, and then if desired, to continue for two more years of full-time study, at which time the Bachelor of Science in Applied Science degree is awarded.

Associate Degree Program

Graduates of the two-year electrical engineering technology program generally function as assistants to electrical engineers in the design, analysis, and laboratory testing of electrical and electronic systems and of rotating machinery. Most graduates are employed by electrical and electronic equipment manufacturers, utility companies, the aerospace industry, and by manufacturing companies in general.

Bachelor's Degree Program

The last two years in the electrical engineering technology program provide the student with a broader technical and business management background. Graduates generally assume more responsibility in the design and testing of electrical systems, and may function independently in some areas.

501. *Circuit Theory I.* Fundamental electrical definitions and units; electrical energy sources, Ohm's law, Kirchhoff's laws; analysis of D.C. circuits; network theorems; magnetic circuits, and permanent magnets. Prereq.: Math 502. (W,Sp) 3 q.h.

501L. *Circuit Theory I Laboratory.* Experiments on the use of instruments; measurements of resistance, effect of length, cross section, and material on resistance; measurement of voltage, currents and power in D.C. series and parallel circuits; network theorems. Three hours of laboratory per week. Taken concurrently with EET 501. (W,Sp) 1 q.h.

502. *Circuit Theory II.* Analysis of elementary magnetic circuits; capacitance; inductance; analysis of simple RC and RL transient circuits; alternating current and voltage; average and effective values; phasor representation of sinusoidal waveforms; phasor algebra; impedance. Prereq.: EET 501. Prereq. or concurrent: Math 503. (F,Sp) 3 q.h.

502L *Circuit Theory II Laboratory.* Experiments on the measurement of inductance and capacitance; simple transient circuits; hysteresis curves; average and effective values; A.C. impedance. Three hours of laboratory per week. Taken concurrently with EET

502. (F, Sp) 1 q.j.

503. *Circuit Theory III.* Analysis of A.C. circuits (steady state solution); phasor diagrams; network theorems; power, power factor; series and parallel resonant circuits; polyphase circuits; mutually coupled circuits. Prereq.: EET 502. Prereq. or concurrent Math 570. (F,W) 3 q.h.

503L. *Circuit Theory III Laboratory.* Experiments on the measurement of voltage, current and power in A.C. single phase series and parallel circuits; resonant circuits; mutually coupled circuits. Three hours of laboratory per week. Taken concurrently with EET 503. (F,W) 1 q.h.

600. *Measurements.* Measurement errors; basic meter in D.C. measurement; basic meter in A.C. measurement; D.C. and A.C. bridges; electronic voltage and current meters; cathode ray oscilloscope; counting and digital display instruments; transducers. Prereq. or concurrent: EET 503. (F) 3 q.h.

600L. *Measurements Laboratory.* Experiments involving the use of basic and specialized equipment to obtain accurate measurements. Precision workmanship and techniques are emphasized. Three hours of laboratory per week. Taken concurrently with EET 600. (F) 1 q.h.

605. *Electronics I.* Basic theory of operation and I-V characteristics of the vacuum diode, gas diode, and semiconductor diode; diode applications, including voltage regulators, rectifiers, clampers, and clippers; basic theory of operation and I-V characteristics of the triode, tetrode, pentode, and junction transistor; D.C. biasing of vacuum tube and transistor amplifiers. Prereq.: EET 502. (F) 3 q.h.

605L. *Electronics I Laboratory.* Experiments on I-V characteristics of vacuum, gas, and semiconductor diodes; voltage regulator; half-wave, full-wave rectifiers; wave-shaping circuits; I-V characteristics of triode and junction transistor; D.C. biasing circuits. Three hours of laboratory per week. Taken concurrently with EET 605. (F) 1 q.h.

606. *Electronics II.* Analysis of vacuum tube, junction transistor, and field-effect transistor amplifiers; transformed coupled, RC coupled, and direct coupled amplifier stages; frequency response for single- and multistage amplifiers. Prereq.: EET 503, EET 605. (W) 3 q.h.

606L. *Electronics II Laboratory.* Experiments on vacuum tube, junction transistor, and field-effect transistor amplifiers; transformer coupled amplifiers; R-C coupled amplifiers; frequency response characteristics. Three hours of laboratory per week. Taken concurrently with EET 606. (W) 1 q.h.

607. *Electronics III.* Analysis of power amplifiers; feedback amplifiers; oscillators; differential amplifiers; operational amplifiers; multivibrators; transistor logic circuits. Prereq.: EET 606. (Sp) 3 q.h.

607L. *Electronics III Laboratory.* Experiments on power amplifiers; feedback amplifiers; sinusoidal and non-sinusoidal oscillators; differential amplifiers; operational amplifiers; logic circuits. Three hours of laboratory per week. Taken concurrently with EET 607. (Sp) 1 q.h.

610. *Direct Current Machines.* Construction and principles of operation of D.C. motors and generators; characteristics, efficiency, control and associated equipment; specialized D.C. machines. Prereq.: EET 502. (W) 3 q.h.

610L. *Direct Current Machines Laboratory.* Experiments on direct current machinery, characteristics, operation, efficiency, control. Three hours of laboratory per week. Taken concurrently with EET 610. (W) 1 q.h.

611. *Alternating Current Machines.* Transformer construction design; standards, operational characteristics; three-phase transformers; alternators; induction motors; synchronous motors; single-phase motors. Prereq.: EET 503, 610. (Sp) 3 q.h.

611L. *Alternating Current Machines Laboratory.* Experiments on transformers; alternators; induction and synchronous motors. Three hours of laboratory per week. Taken concurrently with EET 611. (Sp) 1 q.h.

612. *Electrical Power Systems.* Power systems; transmission line parameters; transmission line calculations; steady state power system representation and calculations; power system economy. Prereq.: EET 610. Concurrent EET 611. 3 q.h.

614. *Industrial Electronics.* Analysis of electronic control circuits in industry; analog and digital time delay circuits; silicon controlled rectifier circuits; photoelectric devices; phase shift control. Prereq. or concurrent: EET 606. (W) 3 q.h.

616. *Industrial Controls.* Study of manual and automatic starting and speed control of

AC and DC motors, overload protection, magnetic and solid state switching systems. Prereq.: EET 614. Concurrent: EET 611. (Sp) (Sp.) 4 q.h.

710. *Networks.* An introduction to the Laplace transform and its application to the analysis of electrical networks, including coupled circuits, filters, attenuators, and equalizers. Three hours lecture, three hours laboratory per week. Prereq.: EET 503. Prereq. or concurrent: Math 770. 4 q.h.

720. *Pulse Circuit Design.* A study in the analysis and design of active circuits employed in electronic switching applications and in the generation of nonsinusoidal waveforms. Three hours lecture, three hours laboratory per week. Prereq.: EET 607. 4 q.h.

730. *Logic Systems Design.* An introduction of Boolean algebra and Karnaugh maps, and the design of combinational logic circuits and sequential switching systems. Three hours lecture, three hours laboratory per week. Prereq.: EET 607. 4 q.h.

810. *Electrical Systems Design.* A course concerning the design and layout of electrical systems for power, light, heat, signals, and communications in commercial, industrial, and residential buildings. Three hours lecture, three hours laboratory per week. Prereq.: EET 607, 611. 4 q.h.

820. *Power Transmission.* An introduction to power system analysis, transmission line parameters and calculations, and steady state power system representation. Prereq.: EET 661. 4 q.h.

Associate Degree Program

FIRST YEAR

FIRST QUARTER	Hrs.
Math. 502 Algebra II	5
Eng. 550 Basic Comp. I	4
ME 500 Dwg. Fundamentals	3
ET 505 Elements Engr. Technology	4
	16

SECOND QUARTER	Hrs.
Math. 503 Trigonometry	5
H&PE 590 Health Education	3
CPT 601 Scientific Prog. I	4
EET 501 Circuit Theory I	3
EET501 L Circuit Theory I Laboratory	1
	16

THIRD QUARTER	Hrs.
Math. 570 Applied Math. I	5
Physics 501 Fundamentals of Physics I	4
Social Studies elective	3
EET 502 Circuit Theory II	3
EET 502L Circuit Theory II Laboratory	1
	16

SECOND YEAR

FOURTH QUARTER	Hrs.
Social Studies elective	3
EET 503 Circuit Theory III	3
EET 503L Circuit Theory III Lab.	1
EET 600 Measurements	3
EET 600L Measurements Lab	1
EET 605 Electronics I	3
EET 605L Electronics I Lab.	1
	15

FIFTH QUARTER	Hrs.
Speech 652 Business and Professional Speech	3
Soc. Sci. 502 Intro. to Econ.	3
EET 606 Electronics II	3
EET 606L Electronics II Lab.	1
EET 610 Direct Current Machines	3
EET 610L Direct Current Mach. Lab	1
EET 614 Industrial Electronics	3
	17

SIXTH QUARTER	Hrs.
Physics 503 Fund. of Physics III	3
Physics 503L Fund. of Physics III Lab.	1
EET 607 Electronics III	3
EET 607L Electronics III Lab.	1
EET 611 Alternating Current Mach	3
EET 611L Alternating Current Mach. Lab	1
EET 616 Industrial Controls	4
	16

Total Credit Hours **96**

Bachelor's Degree Program

THIRD YEAR

SEVENTH QUARTER	Hrs.
Eng. 551 Basic Comp. II	4
Math. 670 Applied Math II	4
CPT 701 Scientific Prog. Applications	4
EET 720 Pulse Circuit Design	4
H&PE Activity Course	1
	17

EIGHTH QUARTER	Hrs.
Humanities elective	4
Math. 770 Applied Math III	4
EET 730 Logic Systems Design	4

Elective	4
	16

NINTH QUARTER	Hrs.
Social Studies elective	3
CET 604 Prop/Stgth of Materials	4
Free elective	4
EET 710 Networks	4
H&PE Activity Course	1
	16

FOURTH YEAR TENTH QUARTER	Hrs.
Humanities elective (700-level)	4
Mgmt. 725 Fundamentals of Management	4
MET 630 Manufacturing Techniques	4
CET 800 Building Systems	4
	16

ELEVENTH QUARTER	Hrs.
Econ. 704 Economics and Social Statistics I	4
Mgmt. 715 Business Law I	4
EET 810 Electrical Systems Design	4
MET 700 Physical Measurements	4
	16

TWELFTH QUARTER	Hrs.
Social Studies elective (700-level)	4
Mgmt. 819 Production Management	4
Elective	4
EET 820 Power Transmission	4
H&PE Activity Course	1
	17
Total credit hours	**194**

Mechanical Engineering Technology

Associate Professor Barsch (Program Coordinator), Assistant Professor Suchora.

The mechanical engineering technology program is designed as a "TWO-PLUS-TWO" program. Students completing the first two years of the program are awarded the Associate in Applied Science degree and are prepared to support engineers as technicians in various industrial activities including drafting, design and production. Graduates are sought by industries engaged in the production of heavy equipment and consumer products.

Bachelor's Degree Program

Students completing the associate degree program may elect to complete the remaining two years on either a full- or part-time basis. Upon completion of the second two years of the program, students are awarded the Bachelor of Science in Applied Science degree and are prepared to function as technologists in industrial positions of greater responsibility and potential. Students may use the free electives to satisfy the requirements for a minor in management, or to take additional courses in an area of special interest.

515. *Mechanics I.* Study of forces as vector quantities; resultant of force systems; principles of mechanical equilibrium; application of basic principles to problems involving trusses, frames, machine elements; friction, and internal forces. Concurrent: Math. 503 (W) 4 q.h.

516. *Mechanics II.* Continuation of MET 515 with applications of basic principles of statics, introduction to dynamics of solids, study of various types of motion, Newton's second law, concept of work and energy, impulse and momentum. Prereq.: MET 515. (Sp) 4 q.h.

550. *Advanced Drawing.* An advanced course devoted to the development of drafting proficiency and drawing interpretation abilities. Three hours lecture, three hours laboratory per week. Prereq.: ME 501 (W) 4 q.h.

605. *Thermodynamics.* Fundamental concepts and definitions, first law of thermodynamics, physical properties, ideal and real gases, second law of thermodynamics, application to thermodynamic cycles involving power plants and cyclic machinery. Three hours lecture, three hours laboratory per week. Prereq.: Math 570. (W) 4 q.h.

606. *Machine Design I.* Study and design of machine elements such as bolts, screws, shafts and welded connections. Three hours lecture, three hours laboratory per week. Concurrent: CET 607. (W) 4 q.h.

607. *Machine Design II.* Continuation of 606 with the study of gears, cams, clutches, flywheels, and the application of standard machine components. Three hours lecture and three hours laboratory per week. Prereq.: MET 606. (Sp) 4 q.h.

610. *Mechanical Equipment.* The study of common mechanical equipment such as heat exchangers, refrigerators, pumps, and internal combustion engines. Prereq.: MET 605 or MET 615. (Sp) 3 q.h.

610L. *Mechanical Equipment Laboratory.* Laboratory tests and applications of equip-

ment covered in MET 610. Three hours laboratory per week. Concurrent with MET 610. (Sp) 1 q.h.

615. *Fluid Mechanics.* Fundamental concepts, fluid statics, a study of the basic laws of fluid mechanics and their application to incompressible flow in pipes and channels, dimensional analysis, fluid measurements. Three hours lecture, three hours laboratory per week. Prereq.: MET 516. (F) 4 q.h.

620. *Tool Design.* Practice and procedure in design and selection of tools such as cutting tools, jigs, fixtures, and dies used in industry. Prereq.: MET 630. (Sp) 3 q.h.

630. *Manufacturing Techniques.* The study of manufacturing methods, processes, tooling, and equipment. Topics include casting, heat treatment, hot and cold working, welding. (F) 3 q.h.

630L. *Manufacturing Techniques Laboratory.* Practice and procedures of machine tool operation including lathes, drill presses, shapers, and milling machines. Three hours laboratory per week. Concurrent with MET 630. (F) 1 q.h.

700. *Physical Measurements.* Practice in the use and selection of instruments for measuring pressure, temperature, strain, force, flow rate, vibration, etc. Three hours lecture, three hours laboratory per week. Prereq.: EET 501 or equivalent. 4 q.h.

720. *Mechanisms.* Graphical and analytical solution of problems involving displacement, velocity, and acceleration in machine mechanisms. Design of linkages to provide required motions in machine members. Three hours lecture, three hours laboratory per week. Prereq.: MET 607. 4 q.h.

810. *Manufacturing Systems Analysis.* Study of manufacturing systems including process, design value analysis, manufacturing process analysis, selection and sequencing: machine tool cost and functions, manufacturing economics, system characteristics and post production analysis. Prereq.: MET 630. 4 q.h.

812. *Numerical Control I.* A study of the programming of numerically controlled machine tools. Students will prepare and verify programs for controlling NC machines using computer assisted languages such as COMPACT II. Three hours lecture and three hours laboratory per week. Prereq.: MET 630 or consent of instructor. 4 q.h.

813. *Numerical Control II.* A continuation of MET 812 with emphasis on advanced programming methods in numerical control. Compact II or similar such languages will be used.

820. *Machine Systems.* Analysis and design of complex machine systems incorporating electrical, pneumatic, and hydraulic subsystems. Students will work on comprehensive projects. Three hours lecture, three hours laboratory per week. Prereq.: MET 715, MET 720, EET 725. 4 q.h.

830. *Advance Tool Design.* Advanced tool design projects including the design of bending, forming and drawing dies, inspection and gaging and associated subsystems and material feed mechanisms. Three hours lecture, three hours laboratory per week. Prereq.: MET 620 4 q.h.

840. *Mechanisms II.* A continuation of MET 720 with emphasis on computer aided techniques of analysis and design of mechanisms to perform desired machine motions. Topics considered include elementary complex number methods, atlas techniques, and algebraic design procedures. Prereq.: MET 720, CPT 601. 4 q.h.

Associate Degree Program

FIRST YEAR

FIRST QUARTER	Hrs.
Math. 502 Algebra II	5
ME 501 Engr. Drawing	3
ET 505 Elements Engr. Tech.	4
Chem. 501 Survey of Chem.	4
Chem. 510L Survey of Chem.	1
	17

SECOND QUARTER	Hrs.
Math. 503 Trigonometry	5
Engl. 550 Basic Comp.	1-4
Soc. Studies Elective *	3
MET 515 Mechanics I	4
	16

THIRD QUARTER	Hrs.
Math. 570 Applied Math I	5
Social Studies elective	3
MET 516 Mechanics II	4
CET 604 Prop./Stgth. of Matls.	4
	16

SECOND YEAR

FOURTH QUARTER	Hrs.
MET 630 Manufacturing Techniques	3
MET 630L Manufacturing Techniques Laboratory	1

MET 615 Fluid Mechanics	4
CET 607 Solid Mechanics	4
Social Studies elective	3
	15

*Social Studies elective—Select one course maximum from any three of: economics, geography, history, political science, psychology, sociology or social science.

FIFTH QUARTER	Hrs.
MET 605 Thermodynamics	4
MET 606 Machine Design I	4
MET 550 Advanced Drawing	4
Phys. 502 Fundamentals of Physics II	3
Phys. 502L Fundamentals of Physics II Lab	1
	16

SIXTH QUARTER	Hrs.
MET 610 Mechanical Equipment	3
MET 610L Mech. Equip. Lab.	1
MET 607 Machine Design II	4
MET 620 Tool Design	3
Speech 652 Business and Professional Speech	3
H&PE 590 Health Education	3
	17
Total Credit Hours	**97**

THIRD YEAR

SEVENTH QUARTER	Hrs.
Math. 670 Applied Math II	4
CPT 601 Scientific Prog. I	4
English 551 Basic Comp. II	4
Science elective (non Math.)	4
H&PE Activity Course	1
	17

EIGHTH QUARTER	Hrs.
Math. 770 Applied Math. III	4
CPT 701 Scientific Prog. Application	4
Engineering Technology elective	4
Humanities elective	4
H&PE Activity Course	1
	17

NINTH QUARTER	Hrs.
Econ. 624 Economics & Social Statistics I	4
MET 720 Mechanisms	4
EET 501 Circuit Theory I	3
EET 501L Circuit Theory I Lab	1
Free Elective	4
H&PE Activity Course	1
	17

FOURTH YEAR

TENTH QUARTER	Hrs.
Social Studies elective (700-level)	4
Mgmt. 725 Funds of Management	4
MET 810 Manufacturing Systems Analysis	4
CET 800 Building Systems	4
	16

ELEVENTH QUARTER	Hrs.
MET 700 Physical Measurements	4
Mgmt. 789 Production Management	4
MET 820 Machine Systems	4
Free Elective	4
	16

TWELFTH QUARTER	Hrs.
Humanities elective (700-level)	4
Mgmt. 820 Production Control	4
MET 830 Advanced Tool Design	4
Elective (700-level)	4
	16
Total Credit Hours	**196**

Metallurgical Engineering Technology

The metallurgical engineering technology program prepares technicians to support the technical needs of the metals industry in general with emphasis on steel making and fabricating. Graduates are employed by a spectrum of diversified manufacturers relating to the metals industry.

While the University maintains an associate degree program in this discipline, course offerings in the program have been temporarily terminated.

HOME ECONOMICS

Professor Feldmiller; Associate Professors Beaubien (Chairman) and Hakojarvi; Assistant Professor Horvath; Instructors Bartholow (on leave) and Hassell (temporary).

The Department of Home Economics offers five academic programs which lead to professional careers in:

Child Care Technology

Dietetic Technology

Food and Nutrition (Dietetics)

General Home Economics

Home Economics Education

The Department also offers courses in NUTRITION for students in Nursing, Dental Hygiene, Health Education, and Medical

Technology. Non-majors may elect courses in Home Economics for general educational purposes.

Curriculum sheets are available for each major and may be obtained from the Home Economics Department or from faculty advisors.

Competency-based courses are offered in some of the programs. These are identified in the bulletin by an asterisk, and are so indicated on course outlines. A student must achieve a stated level of performance in order to progress to the next level. See RP grade, p.46.

A one-year certificate program is offered for the DIETETIC ASSISTANT. The certificate is awarded after completion of 45 hours of course work. A curriculum sheet listing the required courses may also be obtained from the Home Economics Department Office.

CHILD CARE TECHNOLOGY

The two-year Child Care Technology program leads to an Associate in Applied Science degree. Graduates are prepared to manage pre-schools and day care centers.

Students may apply the courses in this program toward a four-year degree in General Home Economics or Home Economics Education.

DIETETIC TECHNOLOGY

Assistant Professor Horvath (Coordinator).

Dietetic Technology is a two-year program leading to the Associate in Applied Science degree. Graduates are prepared to work under the supervision of a registered dietitian (R.D.) in dietary departments of hospitals and nursing homes. They are also employed in commercial food service systems.

Graduates of the program are eligible for Technician Membership in the American Dietetic Association.

The course in this program can be applied toward a four-year baccalaureate degree (B.S. in A.S.) in Food and Nutrition (Dietetics).

FOOD AND NUTRITION (DIETETICS)

The four-year program in Food and Nutrition leads to a Bachelor of Science in Applied Science degree. The program meets the Plan IV academic requirements of the American Dietetic Association and students are eligible to apply for hospital internship in general or clinical dietetics.

It is recommended that Foods and Nutrition majors complete the courses leading to the two-year dietetic technician degree, including the Practicum.

Upon completion of a fifth-year dietetic internship or employment for three years under the supervision of registered dietitians, students may apply for the registration examination given by The American Dietetic Association.

Successful completion of the written examination confers the designation of Registered Dietitian (R.D.).

The student must also meet the general University degree requirements for the Bachelor of Science in Applied Science degree as specified in the catalog.

Courses required in addition to the general University requirements are: Home Economics 549, 551, 551L, 601, 603, 610, 611, 620, 652, 759, 760, 809, 850, 857, 872.

Accounting 605

Biology 551, 552, 604

Chemistry 502, 503, 705

CPT 500 Data Processing Concepts or Math 714

Economics 520 or Social Science 502

Management 725, 804

Math 502

Psychology 701 or 709

Sociology 500, Soc.-Anthorp. 602

Electives in major area to meet career needs

HOME ECONOMICS, GENERAL

The four-year program in Home Economics, General leads to a Bachelor of Science in Applied Science degree. The program provides a broad general education and offers flexibility for the student who wishes to combine it with a minor in business, journalism, art, or management in preparation for careers in the business or the communications field.

The student must also meet the general University degree requirements for the Bachelor of Science of Applied Science degree as specified in the catalog.

Courses required in addition to the general University requirements are: 503, 504, 550, 551, 551L, 601, 604, 652, 705, 706, 707, 762, 763, 770, 850, 852 and electives in home economics to meet career needs.

Biology 551 or 504, 552 or 505, 604

Chemistry 502, 503.

HOME ECONOMICS, EDUCATION

The four-year program in Home Economics Education leads to a Bachelor of Science in Education degree awarded through the School of Education with a major in Home Economics.

The student must meet the general University degree requirements for the Bachelor of Science in Education degree as specified in the catalog.

Students are considered majors in General Home Economics in the College of Applied Science & Technology and upon completing 90 quarter hours with a grade point average of at least 2.40 may transfer into the School of Education to complete the requirements for teacher certification. The student should also read carefully the information provided in the School of Education section on other requirements of that school and of the State of Ohio for certification as a teacher.

Home economics courses required in addition to the general University and School of Education requirements are: 503, 504, 550, 551, 551L, 601, 604, 652, 705, 706, 707, 762, 763, 770, 780, 800, 850, 852 and electives in home economics to meet career needs.

Biology 551, 552, 604

Chemistry 502, 503

Lower Division Courses

502. *Nutrition Fundamentals.* Study of basic nutrition principles and their relation to growth, development and the maintenance of health. Open to child care technology students and non-majors. (F,W) 4 q.h.

503. *Clothing Selection and Construction.* Designed to assist the student in analyzing personal and family resources and needs in the selection, purchase, use, and care of the wardrobe. Study and use of the commercial pattern and the fundamental processes and problems in the construction of simple garments. Two one-hour discussion and two three-hour laboratory periods a week. (F,Sp) 4 q.h.

504. *Textile Fundamentals.* Fundamentals of fibers, yarns, fabric construction and finishes as related to consumer selection, serviceability, care, and clothing construction. Two one-hour lectures and one two-hour laboratory per week. (F) 3 q.h.

529. *Media Communication for Home Econimists.* The theory, practice and value of communicating with audio-visual media. Laboratory experience will be included in the preparation of materials and the use of modern media for teaching in schools, hospitals, and day care centers. (Sp) 4 q.h.

549. *Orientation to the Health Care Foodservice Field.* Introduction to the role of the health care foodservice worker. Study of the professional role and relationship to other personnel; the health care delivery system in the community; and duties and responsibilities of staff members. (F,W) 3 q.h.

550. *Orientation to Home Economics.* Introduction to content, opportunities, and various points of view about home economics. Current readings and occasional field trips will implement the course. (W) 1 q.h.

551. *Normal Nutrition I.* The fundamentals of human nutrition as they apply to normal requirements. Study of the body's need for essential nutrients, the contribution of various food groups, the selection of an adequate diet, and the importance of diet in achieving and maintaining optimum health. 4 q.h.

551L. *Nutrition Laboratory.* Application of the basic principles of nutrition in the selection of foods for adequate nutriture of the individual and family members. One two-hour laboratory per week. Prereq.: Taken concurrently with Home Economics 551 1 q.h.

601. *Principles of Food Preparation.* Study of physical and chemical properties of food. Basic principles and methods in the selection, purchase, and preparation of food. Two hours of lecture and six hours of laboratory per week. Prereq.: Home Economics 551. 4 q.h.

603. *Diet Therapy.* The purpose of diet therapy and the policies and procedures for diet modifications as delegated to a dietetic technician. Modified diet patterns in various types of group-care institutions are considered. Three hours of lecture and three hours supervised field experience each week. prereq.: Home Economics 551. (F) 4 q.h.

604. *Advanced Clothing Construction.* Planned to develop greater understanding and proficiency in the selection, fitting, and construction of garments to meet individual needs. Construction of garments requiring more difficult techniques. Two one-hour lectures, and two three-hour laboratory periods a week. Prereq.: Home Economics 503, 504. (W) 4 q.h.

609. *Food Systems-Planning and Operations.* Study and practice of efficient work methods; activity analysis, planning, space and equipment arrangements for functional

flow of work in food service departments. Three hours lecture and three hours supervised field experience each week. Prereq.: Home Economics 601. (W) 4 q.h.

610. *Organization and Management.* Organizational structure of various types of food service programs. Administration and tools of management, budget, and cost analysis emphasized. Basic principles in selecting, training, and supervising personnel. Three hours of lecture and two hours of laboratory per week. (W) 4 q.h.

611. *Food Systems-Production.* Quantity food production principles; use and care of large equipment. Practical experience in quantity food production. Two hours of lecture and six hours of laboratory each week. Prereq.: Home Economics 652 and consent of instructor. 4 q.h.

612. *Child Care I.* The child, the home, and the day care center. A study of the day care center and how each aspect of its program relates to family relationships and the development of the child. (F) 4 q.h.

613. *Child Care II.* The philosophy and the organization of a total day care center to include management, program scheduling, and methods of material presentation. Prereq.: Home Economics 612. (W) 4 q.h.

614. *Child Care III.* Supervised participation in all phases of operation and functioning in day care center programs. One hour of lecture and discussion and six hours of laboratory per week. Prereq.: Home economics 613. (Sp) 4 q.h.

620. *Food Systems-Menu Planning, Purchasing and Storage.* Menu planning for dietary departments and factors affecting food purchasing policies, the budget, and cost control. Quantity food purchasing procedures, receiving and storage requirements and controls. Three hours lecture and three hours supervised field experience each week. Prereq.: Home Economics 601. (Sp) 4 q.h.

625. *Food and Beverage Service Management.* Managerial duties and responsibilities in setting goals; forecasting, controlling quality and costs, and establishing policy in the successful operation of a food and beverage department. 2 q.h.

626. *Food Service Supervision* Study of the role of management in food service including employee training, evaluation, affirmative action, and labor management relations. Prereq.: H.E. 611. 3 q.h.

627. *Practicum for Employed Food Service Worker.* The role of management in food service including the importance of employee training, evaluation, and communication within the department. Prereq.: Home Economics 601 and application filed with instructor one quarter prior to registration for the course. 2 q.h.

628. *Practicum in Dietetic Technology.* Experience in the supervision of food production and service under the direction of professional personnel. The student will work 21 hours per week at an approved health care facility. Taken concurrently with H.E. 626. Prereq.: H.E. 611 and application filed with the instructor two quarters prior to registration for the course. 3 q.h.

640. *Historic Costume.* Costume from ancient Egypt to the present, including the influence of social, political and economic conditions on dress, emphazing Western European countries (Even years) (Sp) 4 q.h.

642. *Applied Fabric Design.* A creative approach to fabric design through the use of dyes and needlework as applied to clothing and home furnishings projects. Prereq.: Home Economics 504. (Odd years) (Sp) 4 q.h.

650. *Seminar in Dietetic Technology.* The role of the dietetic technician in the health care delivery system, how the system functions in a community, structure of agencies, delivery, and trends in the industry. Overview of current opportunities in the food service field. Three hours of class per week. Prereq.: Home Economics 628 or equivalent. (Sp) 3 q.h.

652. *Meal Management.* Nutritional, aesthetic, and social aspects of planning, purchasing, preparing and serving of food to families and groups at different income levels. Two hours lecture and two three-hour laboratory periods a week. Prereq.: Home Economics 601. (F, Sp) 4 q.h.

672. *Nutrition and the Pre-School Child.* Study of the nutritional needs of the developing child in the pre-school setting. Emphasis on nutrition education for development of desirable food habits. (W) 4 q.h.

Upper Division Courses

700. *Advanced Textiles.* Study of chemical and physical properties of textiles; new developments, testing procedures, and standards applied to fibers and fabrics. Three one-hour lectures and one three-hour laboratory. Prereq.: Home Economics 504, Chemistry 503. 4 q.h.

702. *Design and Flat Pattern-Making.* Planned to develop greater understanding and skill in the designing, fitting, and construction of garments. Making of a basic pattern and the creation of new designs by use of it. Two one-hour lectures and two two-hour laboratory periods a week. Prereq.: Home Economics 604. (Odd years) (Sp) 4 q.h.

703. *Tailoring.* A study of the fundamental techniques involved in the construction of tailored coats and suits. Two hour lectures and two two-hour laboratory periods a week. Prereq.: Home Economics 702. (Even years) (W) 4 q.h.

704. *Design by Draping.* Creating new dress designs through the draping technique. Prereq.: Home Economics 702. (Odd years) (W) 4 q.h.

705. *Child Psychology.* Identical with Psychology 755 except for the addition of directed observation. Home Economics 706 taken concurrently. 4 q.h.

706. *Child Development Laboratory.* Observation in a nursery school and conferences with the Home Economics departmental staff; taken concurrently with Home Economics 705. 2 q.h.

707. *Psychology of Marriage and Family Relations.* Identical with Psychology 707. 3 q.h.

740. *Family Clothing.* Clothing selection and construction for varying age levels including children, men, the elderly and the physically handicapped. Prereq.: Home Economics 503 or equivalent. (Even years) (Sp) 4 q.h.

750. *Food Science.* Scientific study of food; effect of processing on nutritional and organoleptic properties. Consideration of food additives, natural toxicants, and food-drug interactions; new food sources, enrichment and fortification of foods, composition and nutrient values of special-purpose food products. Prereq.: Home Economics 601, 759; Chemistry 705. (Odd years) 3 q.h.

751. *Advanced Food Preparation.* Advanced study of the interrelationship of principles used in food preparation in homes and Institutions. Prereq.: Home Economics 750 or 763. 4 q.h.

759. *Normal Nutrition II:* Designed to broaden and extend the student's knowledge of the science of nutrition, with emphasis on the metabolism of nutrients at the cellular level. Current research in the field of nutrition will be included. Prereq.: Home Economics 551. (F) 4 q.h.

760. *Nutrition in Disease.* An introduction to the nature and etiology of diseases and the relationship of diet to good health and to disease processes. Also included will be the use of dietary management for meeting the special needs of abnormal conditions. Prereq: Home Economics 603, 759. (W) 4 q.h.

761. *Nutrition and the Athlete.* An investigation of various facets of nutrition that are of special relevance to athletes, such as carbohydrate-loading, protein intake, electrolyte imbalances, and crash diets. Not open to majors in Food and Nutrition. Prereq.: Biology 552 or permission of instructor. 3 q.h.

762. *Housing I: Furnishings.* The fundamentals involved in the judicious selection and arrangement of home furnishings. Consideration is given to family needs and resources, aesthetic principles, and the importance of planning in furnishing the home attractively. Three lecture hours and one two-hour laboratory period a week. (F) 4 q.h.

763. *Housing II: Equipment.* The selection, care, and use of various items of household equipment with comparison of the merits of different types in respect to materials, design, cost, and performance. Three lecture hours and one two-hour laboratory period a week. Prereq.: Home Economics 762. (W) 4 q.h.

770. *Activity Analysis.* Task analysis of work done in homes and institutions. Three lecture hours and one two-hour laboratory period per week. Prereq.: Home Economics 763. (Odd years) (Sp) 4 q.h.

771. *Demonstration Techniques.* Techniques and practice in presentations related to various areas in home economics. Two lecture hours and two two-hour laboratory periods a week. Prereq.: Home Economics 601. (Even years) 4 q.h.

780. *Consumer Economics.* Emphasis on becoming informed and effective consumers. Current consumer issues and sources of information for consumers. Four lecture hours a week. Prereq.: Home Economics 763. 4 q.h.

800. *Teaching Vocational Home Economics—Homemaking and Consumer Education.* Principles and practices related to the teaching of homemaking and consumer education. Selection and organization of subject matter and instructional materials for classroom and laboratory. Prereq.: Ed. 706 and 15 hours credit in home economics.(W) 3 q.h.

809. *Institutional Management I.* The principles of business organization and management as applied to problems of institutional food service. Four lecture hours a week. Prereq.: Consent of instructor. (Odd years.) (W) 4 q.h.

810. *Experimental Food Studies.* Application of scientific principles and experimental procedures to cooking processes. Two lecture hours and one three-hour laboratory period a week. Prereq.: Chemistry 503 and Home Economics 652. (Even years.) (Sp). 3 q.h.

825. *Current Nutrition Concepts.* Readings and critical appraisal of research literature in nutrition. Prereq.: Home Economics 759, Chemistry 705. 4 q.h.

850. *Seminar in Home Economics.* Required of all seniors majoring in home economics. Prereq.: Senior standing and consent of faculty.(W) 2 q.h.

852. *Home Management.* Study of the home, its functions and operation, and resources recognized by the family. Three lecture hours and one two-hour laboratory period a week. Prereq,: Home Economics 770.(F) 4 q.h.

853. *Home Management Laboratory.* Application of principles of management and decision-making in a group or family setting. Prereq.: Home Economics 852. 6 q.h.

857. *Institutional Management II.* The selection of equipment for institutional food service with consideration of need, quality, cost and trends in the market. The selection and purchase of food for institutional food service with consideration of quality, cost and marketing practices. Prereq.: Junior or senior standing with consent of instructor. (Odd years.) (Sp) 4 q.h.

861. *Quantity Cookery.* Study and use of large equipment and the application of the principles of cookery in planning, preparing, and serving food for institutions. Six laboratory discussion hours a week. Laboratory may be conducted off-campus. Prereq.: Consent of instructor. (F) 4 q.h.

862. *Cultural and Nutritional Aspects of Food.* Food patterns and practices of selected world cultures. Evaluation of these patterns in meeting dietary needs with consideration of the existing social, economic, and environmental conditions. Prereq.: Home Economics 601, Soc.-Anthrop. 602. 4 q.h.

870. *Home Economics Workshop.* Special workshops for inservice education. Offered in a professional area of home economics as needed in the summer for two-four weeks. Prereq.: Teaching experience or permission of instructor. 2-4 q.h.

872. *Maternal and Child Nutrition.* A study of fundamental nutritional needs of the mother and child at all stages of development with special emphasis on problems of prematurity and malnutrition in children. Indices of growth and development will be included with consideration for the individuality of the child. Prereq.: Home Economics 759, or consent of instructor. 4 q.h.

873. *Nutrition and Aging.* Study of the nutrition needs of the adult and the process of aging. Included are the influences of food availability, intake, economics, culture, chronic disease and physical and social conditions as they affect the ability of the aged to cope with living situations. Prereq.: Home Economics 551 or permission of instructor. 4 q.h.

875. *Directed Individual Study.* Individual study or research of a special problem or issue related to home economics or nutrition. Application must be made with the department prior to registration. Prereq.: Senior standing and approval of instructor. 2-3 q.h.

CHILD CARE TECHNOLOGY CURRICULUM

FIRST YEAR

FIRST QUARTER	Hrs.
Engl. 550 Basic Composition I	4
Home Ec. 502 Nutrition Fundamentals	4
Psych. 560 General Psychology	4
Soc. 500 Fundamentals of Sociology	4
	16

SECOND QUARTER	Hrs.
Engl. 551 Basic Composition II	4
Biol. 505 Biology & Modern Man	4
Home Ec. 707 Psychology of Marriage and Family Relations	3
H&PE 590 Health Education	3
	14

THIRD QUARTER	Hrs.
Psych. 755 Developmental Psychology I (Child)	4
Home Ec. 706 Child Development Lab	2
Mus. Ed. 722 Music Education in Early Childhood	3

Art 760 School Arts	4
Soc. 601 Social Problems	4
	17

SECOND YEAR

FOURTH QUARTER	Hrs.
Home Ec. 612 Child Care I	4
Home Ec. 672 Nutrition & the Pre School Child	4
Home Ec. 529 Media Communication	4
H&PE 721 Health Education in Elem. Schools	4
	16

FIFTH QUARTER	Hrs.
Home Ec. 613 Child Care II	4
Speech 705 Speech Prob. for the Classroom Teacher	3
Educ. 630 Pre-School Curriculum	3
Soc. 620 Intro. to Social Services	4
Elective (Technical)	4
	18

SIXTH QUARTER	Hrs.
Home Ec. 614 Child Care III	4
H&PE 622 Motor Analysis	1
H&PE 722 Phys. Ed. for Elem. Grades	3
Elective	7
	15
Total Credit Hours	**96**

DIETETIC TECHNOLOGY CURRICULUM

FIRST YEAR

FIRST QUARTER	Hrs.
Engl. 550 Basic Composition I	4
Home Ec. 551 Normal Nutrition I	4
Home Ec. 551L Nutrition Laboratory	1
Home Ec. 549 Orientation to Health Care Foodservice Field	3
Chemistry 502 Survey of Chemistry II	4
	16

SECOND QUARTER	Hrs.
Engl. 551 Basic Composition II	4
Home Ec. 601 Prin. Food Preparation	4
Chem. 503 Survey of Chemistry III	4
Soc. 500 Fundamentals of Sociology	4
	16

THIRD QUARTER	Hrs.
Home Ec. 652 Meal Management	4
Psych. 560 General Psychology	4
Home Ec. 620 Food Systems—Menu Planning, Purchasing & Storage	4
H&PE 590 Health Education	3
	15

SECOND YEAR

FOURTH QUARTER	Hrs.
Home Ec. 610 Organization & Management	4
Home Ec. 603 Diet Therapy	4
Home Ec. 611 Food Systems-Production	4
Econ. 520 Principles of Economics I	3
	15

FIFTH QUARTER	Hrs.
Home Ec. 628 Practicum in Dietetic Tech	8
Home Ec. 609 Food Systems-Planning and Operations	4
Elective	3
	15

SIXTH QUARTER	Hrs.
Home Ec. 650 Seminar in Dietetic Tech	3
Biol. 604 Food Microbiology	4
Acctg. 605 Elementary Accounting I	5
Home Economics Elective	4
Elective	3
	19
Total credit hours	**96**

SUGGESTED ELECTIVES:	Hrs.
Home Ec. 503 Clothing Selection and Construction	4
Home Ec. 504 Textile Fundamentals	4
Home Ec. 529 Media Communication	4
Home Ec. 672 Nutrition & the Preschool Child	4
Soc. 620 Intro. to Social Services	4
BET 704 Business Communications	4

MEDICAL TECHNOLOGY
See Allied Health.

NURSING

Associate Professor DeCapita (chairman); Assistant Professors Engelhardt, Erickson, Kennedy, Scheetz; Instructors Baer, Butler, Davis, Hedrick, McCarthy, Owens.

The Nursing Program is based on the "TWO-PLUS-TWO" concept. This provides the student the opportunity to earn a two-year Associate in Applied Science degree with a major in nursing and to continue for two more years of study to earn a Bachelor of Science in Applied Science degree with a major in nursing.

Students who successfully complete the

two-year associate degree program will be eligible to take the Ohio Licensing Examination for registered nurses and will be prepared to serve as staff nurses in hospitals and clinics, as private duty nurses, and in doctors' offices. The program consists of 102 quarter hours, of which 51 quarter hours are lower division nursing courses.

The associate degree nursing program is approved by the Ohio State Board of Nursing Education and Nurse Registration and is fully accredited by the National League for Nursing.

In the bachelor's program, a part-time plan may be arranged to accommodate graduates whose employment provides the finances for this education. A minimum of 194 quarter hours, of which 24 quarter hours are upper division nursing courses, are required for the baccalaureate degree.

The following upper division nursing courses are required: 705, 706, 707, 805, 806 and 807. The minimum degree requirement of 194 quarter hours must include the following courses: Speech 652; Psychology 707, 709; Sociology 705; and Management 725, 750. All general degree requirements must be met. Electives in foreign languages and science may be advised for the nurse who wishes to pursue graduate study.

Additional suggested courses for the baccalaureate degree: Computer Technology 500; Biology 721-721L, 775, 808, 823; English 715, 740, 746; Management 712, 713; upper division writing course; Nursing 710, 714.

The registered nurse certificate is a prerequisite for students entering the upper division nursing courses leading to the baccalaureate degree.

Registered nurses who are graduates of approved diploma nursing programs will be evaluated on an individual basis and placement in the program determined by credit by examination in accordance with policies set forth by the University.

It is the student's responsibility to fulfill the graduation requirements for the Bachelor of Science in Applied Science degree. These requirements consist of the following:

I. The pre-college course requirements.

II. General course requirements in the area of the humanities, social studies, science; the English and physical activity courses.

III. The nursing major requirement with an average grade of *C* or better.

IV. A minor consisting of at least 21 quarter hours with grades of *C* or better in a department other than that of the major.

All agencies used for field instruction and for clinical practice are approved by appropriate accrediting bodies.

The Department of Nursing maintains membership in the Council of Member Agencies of the Baccalaureate and Higher Degree Program, and the Council of Associate Degree Programs of the National League for Nursing.

Academic Requirements in the Associate Degree program

Students are admitted to the associate degree program in the fall, winter, and spring quarters of each year. Closing dates for accepting applications are:

March 1 — Fall Quarter
October 1 — Winter Quarter
January 1 — Spring Quarter

Applicants seeking admission directly into the nursing program must meet the following requirements:

1. The general University pre-college requirements for the Associate in Applied Science degree.
2. Rank in the upper half of high school graduation class. Earned a grade of or higher in all subjects required for admission to the program.
3. Minimum score of 20 in all areas tested on the American College Test. SAT scores of at least 500 in each test category (Verbal Composition and Mathematics) may be substituted for performance on the ACT test.
4. Physical and dental examinations.

Transfer applicants, current and former YSU students must meet these same requirements and, in addition, must:

1. Have completed a college chemistry course equivalent to Chemistry 502 with a grade of *C* or higher.
2. Have a cumulative point average of at least 2.50 when all grades from any and all colleges and/or universities are included.

Former students who have satisfactorily

completed one or more nursing courses and are seeking readmission to the Nursing Program will be considered on an individual basis.

Students transferring from another associate degree nursing program should consult with the Department of Nursing before applying to the University.

A grade of *C* or better is required in all nursing and nursing laboratory courses. One repetition of a nursing theory or laboratory course will be permitted within the associate degree program.

Progression in the associate degree program requires a cumulative point average of 2.0 or above. Students earning less than a 2.0 cumulative point average and/or fail more than one nursing course are transferred to another department of their choice.

Lower Division Courses

501. *Introduction to Nursing I.* In this course, a student is introduced to nursing as a health service, and to the role of the nurse in the promotion of human needs and their significance for nursing care. 501 must be taken concurrently with 501 laboratory. Prereq.: Permission of chairman. 3 q.h.

501L. *Introduction to Nursing Laboratory.* Clinical laboratory provides the principles and application of basic nursing skills. Satisfactory achievement of clinical objectives is requisite for passing 501L. 501L must be taken concurrently with 501. Six hours of laboratory per week. Prereq.: Permission of chairman. 2 q.h.

502. *Introduction to Nursing II.* This course presents the theory underlying the practice of more complex nursing care of patients. 502 must be taken concurrently with 502 laboratory. Prereq.: Nursing 501 and 501L with a grade of *C* or better; Biol. 551. 4 q.h.

502L. *Introduction to Nursing II Laboratory.* Clinical laboratory experience provides opportunity for application of basic and more complex nursing principles. Satisfactory achievement of clinical objectives is requisite for passing 502L. 502L must be taken concurrently with 502. Six hours of laboratory per week. Prereq.: Nursing 501 and 501L with a grade of *C* or better; Biol. 551. 2 q.h.

505. *Nursing Care of Adults and Children I.* The major emphasis is upon the normal aspects of maternal, infant, and child health. Developmental stages from conception through adolescence are presented. Deviations from normal in the maternity cycle, newborn infant, and childhood are included. The course 505 must be taken concurrently with 505 laboratory. Prereq.: Nursing 502 and 502L with a grade of *C* or better; Biol. 552; Psych. 755 (or concurrently); Home Ec. 551. 5 q.h.

505L. *Nursing Care of Adults and Children Laboratory.* Clinical experience is provided in the care of maternity patients, the newborn, infant, and children. Satisfactory achievement of clinical objectives is requisite for passing 505L. 505L must be taken concurrently with 505. Nine hours of laboratory per week. Prereq.: Nursing 502 and 502L with a grade of *C* or better; Biol. 552; Psych 755 (or concurrently). 3 q.h.

610. *Nursing Care of Adults and Children II.* The major focus of this course is the nursing care of children and adults with problems of abnormal behavior. The course 610 must be taken concurrently with 610 laboratory. Prereq.: Nursing 505 and 505L with a grade of *C* or better; Biol. 560. 6 q.h.

610L. *Nursing Care of Adults and Children II Laboratory.* Learning experiences in mental health, general, and rehabilitation hospitals are provided with field trips to related agencies. Satisfactory achievement of clinical objectives is requisite for passing 610L. The course 610 must be taken concurrently with 610. Twelve hours of laboratory per week. Prereq.: Nursing 505 and 505L with a grade of *C* or better; Biol. 560. 4 q.h.

611. *Nursing Care of Adults and Children III.* The major health problems encountered by children and adults are studied. The biological and psychosocial effects of illness are included. The course 611 must be taken concurrently with 611 laboratory. Prereq.: Nursing 610 and 610L with a grade of *C* or better; Chem. 502. 6 q.h.

611L. *Nursing Care of Adults and Children III Laboratory.* Clinical laboratory experience provides opportunity for application of care in major health problems of children and adults. Satisfactory achievement of clinical objectives is requisite for passing 611L. 611L must be taken concurrently with 611. Twelve hours of laboratory per week. Prereq.: Nursing 610 and 610L with a grade of *C* or better; Chem. 502. 4 q.h.

612. *Nursing Care of Adults and Children*

IV. The study of major health problems of children and adults is continued. The biological and psychosocial effects of illness are included. The course 612 must be taken concurrently with 612 laboratory. Prereq.: Nursing 611 and 611L with a grade of *C* or better; Chem. 502; Chem. 503. 6 q.h.

612L. *Nursing Care of Adults and Children IV Laboratory.* Clinical laboratory experience provides the opportunity for application of care of children and adults with major health problems. The biological and psychosocial effects of illness are included in the health care of patients. Satisfactory achievement of clinical objectives is requisite for passing 612L. 612L must be taken concurrently with 612. Twelve hours of laboratory per week. Prereq.: Nursing 611 and 611L with a grade of *C* or better; Chem. 502; Chem. 503. 4 q.h.

613. *Role of the Registered Nurse.* A study of the role of the associate degree nurse graduate as a registered nurse practitioner, a citizen, and an individual. Content includes contemporary nursing trends, career opportunities, and the legal and ethical responsibilities of the nurse. Prereq.: Concurrent enrollment in Nursing 612 and 612L. 2 q.h.

Upper Division Courses

705. *Modern Issues in Nursing.* Current trends in nursing education and practices. Study of factors relevant to understanding the different philosophical approaches to nursing. Prereq.L Registered nurses only. (F) 4 q.h.

706. *Family and Community Nursing I.* A study of factors that influence individual family, and community health. Focus on basic human needs with an introduction to the role of nursing and health agencies in meeting these needs on an individual, family, and community basis. Use of appropriate community resources and agencies. Prereq.: Nursing 705. (W) 4 q.h.

707. *Family and Community Nursing II.* Provides student laboratory experience in therapeutic nursing intervention for patient with complicated health problems, experience in community health agencies with emphasis on philosophy of positive health, and skills in preventive and promotional procedures. One hour conference, eight hours laboratory per week. Prereq.: Nursing 706, Sociology 705. (F, Sp) 4 q.h.

710. *Coronary Care Nursing.* Prepares registered nurses for knowledgeable and competent nursing care in the Coronary Care Unit. Includes selected study of anatomy and physiology of heart and circulation, bio-electricity, electrocardiography, and phychosocial aspects of nursing care of acute myocardial infarction patient. Three hours of lecture and three hours of laboratory work per week. Prereq.: Nursing 705 or permission of instructor. (F) 4 q.h.

714. *Intensive Care Nursing.* Prepares registered nurses for knowledgeable and competent nursing care in Intensive Care Units. It focuses on the nursing process: assessment and intervention of individuals with needs arising from multiple disruptions among body systems. Three hours seminar and three hours laboratory work per week are required. Prereq.: Nursing 707 or permission of instructor. (W) 4 q.h.

805. *Nursing Leadership I.* Principles of team nursing with emphasis on the nurse's responsibility in directing nursing personnel in patient care. Management principles or guides for action in beginning leadership positions in nursing. Prereq.L Nursing 705. (F) 4 q.h.

806. *Nursing Leadership II.* Designed to prepare the student to coordinate theory and its application to function as a beginning nursing team leader. One hour conference, eight hours laboratory per week. Prereq.: Nursing 805; Management 725. (W) 4 q.h.

807. *Nursing Seminar.* A reading in selected nursing studies and/or research and reports. Experience in the identification and definition of a nursing problem. Each student writes a paper encompassing a specific nursing problem or issue. Prereq.: Nursing 707, 806; Management 750. (Sp) 4 q.h.

Curriculum leading to the Associate in Applied Science Degree

FIRST YEAR

FIRST QUARTER	Hrs.
Biol. 551 Physiology and Anatomy of Man I	4
Home Ec. 551 Normal Nutrition I	4
Engl. 550 Basic Composition I	4
Nurs. 501 Introduction to Nursing I	3
Nurs. 501L Nursing I Laboratory	2
	17

SECOND QUARTER	Hrs.
Biol. 552 Physiology and Anatomy of Man II	4
Psych. 560 General Psychology	4

Eng. 551 Basic Composition II	4
Nurs. 502 Introduction to Nursing II	4
Nurs. 502L Nursing II Laboratory	2
	18

THIRD QUARTER	Hrs.
Biol. 560 Paramedical Microbiology	5
Psych. 755 Developmental Psychology I (Child)	4
Nurs. 505 Nursing Care of Adults & Children I	5
Nurs. 505L Adults & Children I Laboratory	3
	17

SECOND YEAR FOURTH QUARTER	Hrs.
Chem. 502 Survey of Chemistry II	4
Soc. Sci. 501 Introduction to Social Science	3
Nurs. 610 Nursing Care of Adults & Children II	6
Nurs. 610L Adults & Children II Laboratory	4
	17

FIFTH QUARTER	Hrs.
Chem. 503 Survey of Chemistry III	4
Elective (Lower division course from Art, Music. History, Philosophy, Economics, Political Science or Black Studies)	3
Nurs. 611 Nursing Care of Adults & Children III.	6
Nurs. 611L Adults & Children III Laboratory	4
	17

SIXTH QUARTER	Hrs.
Soc. 500 Fundamentals of Sociology	4
Nurs. 612 Nursing Care of Adults & Children IV	6
Nurs. 612L Adults & Children IV Laboratory	4
Nurs. 613 Role of the Registered Nurse	2
	16

Total Credit Hours **102**

REAL ESTATE TECHNOLOGY

See *Business Education and Technology.*

SECRETARIAL STUDIES

See *Business Education and Technology.*

SOCIAL SERVICES TECHNOLOGY

The College of Applied Science and Technology in cooperation with the Department of Sociology, Anthropology, and Social Work offers a two-year program in Social Service Technology leading to the degree Associate in Applied Science. Students in this program are advised in the Department of Sociology, Anthropology, and Social Work.

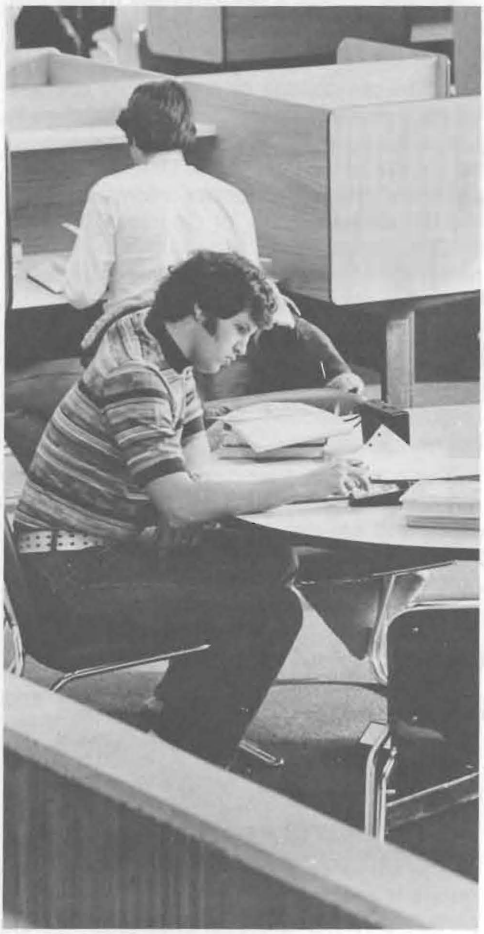
The *primary* purpose of this program is to provide a formal two-year degree for those currently employed as social worker aides who wish to increase their professional qualifications, and for those who are entering the field of social work at the less complex positions.

The student must take the general degree requirements and department course requirements as follows:

DEPARTMENT COURSE REQUIREMENTS	Hrs.
500 Fundamentals of Sociology	4
620 Introduction to Social Work	4
621 Human Development and Social Environment	4
719 Health Care Systems	3
722 Social Casework Methods	3
723 Social Groupwork Methods	3
724 Community Organization Methods	3
725 Field Work in Social Services	6
734 Field Work Seminar	2
	32
Other Technical Subjects	13
	45

GENERAL UNIVERSITY REQUIREMENTS	Hrs.
English 550, 551 Basic Composition I & II	8
Humanities Elective	4
Science Elective	4
Science/Math Elective	4
Psychology 560 Introduction to Psychology	4
H & PE 590 Health Education	3
BE & T 520 or 521 Typewriting I or II	2
BE & T 510 Office Procedures	4
Electives	18
	51
TOTAL	**96**

College of Arts and Sciences



Bernard J. Yozwiak, Dean

ORGANIZATION AND DEGREES

Two degrees are granted through the College of Arts and Sciences: Bachelor of Arts (A.B.) and Bachelor of Science (B.S.). The departments of this unit are as follows:

- Department of Biological Sciences
- Department of Chemistry
- Department of Economics
- Department of English
- Department of Foreign Languages and Literatures
- Department of Geography
- Department of Geology
- Department of Health and Physical Education
- Department of History
- Department of Mathematical and Computer Sciences
- Department of Military Science
- Department of Philosophy and Religious Studies
- Department of Physics and Astronomy
- Department of Political Science and Social Science
- Department of Psychology
- Department of Sociology, Anthropology and Social Work

OBJECTIVES OF THE COLLEGE OF ARTS AND SCIENCES

Within Youngstown State University the College of Arts and Sciences strives to prepare students for full and productive lives by helping them develop the skills to observe, analyze and make rational judgments. The College further attempts to familiarize students with the ways in which these skills have contributed and continue to contribute to knowledge and progress in a civilized society. To these ends students are introduced to a reasonably wide range of studies, as well as given intensive training in particular areas. Students are thus given not only a basis for competence in a career, but the ability to function well in a world which requires an understanding in areas beyond their specialty.

MAJOR AND MINOR FIELDS

For the A.B. degree. The major may be in any of the departments listed above (except military science), with French, German, Italian, Latin, Russian, and Spanish regarded as separate departments for this purpose. It may be an interdepartmental or combined major in American studies, classical studies, earth science, combined science, the humanities, public relations, or social studies. It may be in music, in elementary education, or in any business administration or engineering subject in which a major is possible.

For the B.S. degree. Majors are possible in biology, chemistry, computer sciences, geology, mathematics, medical technology, physics, and psychology, as well as combined science.

Prospective teachers. Prospective elementary or secondary teachers may work toward an A.B., B.S., or B.S. in Ed. degree. Prospective high school teachers major in the Arts and Sciences department of their principal field and are advised by the College of Arts and Sciences except for the requirements for teacher certification, for which advisement is by the School of Education.

The minor or minors for any of these degrees, unless determined by a prescribed curriculum, may be in any department or departments in which it is possible to take 21 quarter hours.

The student whose needs are not completely met by existing conventional programs may wish to investigate and apply for the Individualized Curriculum Program. (see the General Requirements and Regulations section.)

REQUIREMENTS FOR DEGREES

Bachelor of Arts and Bachelor of Science

It is the student's responsibility to see that all the graduation requirements for the degree sought are satisfied. These consist of:

1. The pre-college or preparatory courses for each degree. These are normally taken in high school, but if not, they may be made up before the junior year in the University. They are listed below; for further information see *the Condensed Table of Courses Required for Graduation,* in the General Requirements and Regulations section, where the explanatory notes should be read carefully.

2. The courses and other requirements to be completed in the University. They are explained in the General Requirements and Regulations section but are recapitulated below.

The curriculums leading to these degrees require a minimum of 186 quarter hours of credit and are designed to be completed in four academic years. A student willing and able to carry heavier loads successfully may finish in less time.

R.O.T.C. students are allowed certain modifications of the requirement, as explained in the General Requirements and Regulations section.

Requirements for the B.S. in Ed. degree are given in the School of Education section.

PROFICIENCY IN A FOREIGN LANGUAGE

The student's proficiency in a foreign language is determined by the successful completion of either the elementary and/or the intermediate language courses, or a proficiency examination administered by the Department of Foreign Languages and Literatures. The only languages which meet the degree requirements are those listed in the *Courses of Instruction* section that follows. In certain cases the chairman of the Department of Foreign Languages and Literatures is authorized to approve other languages if the appropriate courses have been taken at an accredited American or foreign college or university.

For the Bachelor of Arts degree: four high school units, if they are all in the same language, or *two years of each of two languages* satisfy the requirement, with no further study at the University level. A student who has

PRE-COLLEGE

SUBJECT	HIGH SCHOOL UNITS A.B.	B.S.
English	3	3
United States history and civics	1	1
A foreign language	2	2
Algebra	1 or 2*	1 or 2*
Geometry	1	1
Biology, chemistry, or physics	1	1

*One is enough except for a science major needing Mathematics 571, or for a mathematics minor.

IN THE UNIVERSITY

REQUIREMENTS IN ADDITION TO COURSES

	QUARTER HOURS OF CREDIT	
Completion of the minimum number of quarter hours of credit required for graduation	186	186
Upper Division status (including completion of any specified preparatory units lacking at entrance)	A.B.	B.S.
Major and minor requirements		
Course-level requirements		
Point index requirement		
Resident requirement		
Application for graduation	(The form *Notice of Intention to Apply for Graduation* should be completed in the Dean's Office when the student attains the rank of senior.)	

COURSE REQUIREMENTS (Other than the Major and Minor)

BASIC COURSES (Same as under General Requirements and Regulations)

English 550-551		
Basic Composition I-II	8	8
Health and Physical Education 590 Health Education	3	3
Health and Physical Education activity courses	3	3

AREA COURSES

See page 39 for specific details.

Humanities‡	16	16
Social Studies	20	20
Science/Mathematics (at least 8 q.h. of science)	16	Included in* the major

‡Students seeking a high school teaching certificate must take at least one course in each of two areas of fine arts, philosophy and/or religious studies.

OTHER COURSES (In addition to General Requirements and Regulations)	A.B.		B.S.
A foreign language	8	or	4

For the A.B. degree; the requirement is the successful completion of the intermediate sequence of courses (or equivalent) if the same language is used to fulfill the entrance requirement. If a different language is used, the requirement is different (see *Proficiency in a Foreign Language*).

For the B.S. degree: the requirement is the successful completion of the first quarter of the intermediate language course (or equivalent) if the same language the student used to fulfill the entrance requirement, or the first full year of college foreign language (or equivalent) if a different language is elected.

Balance required for graduation. The student allots these hours, in accordance with requirements and desires, to completing a major, one or more minors, teaching fields, other special objectives, and elective courses anywhere in the University for which the student can satisfy the prerequisities and which are acceptable toward the degree.	—	—
Teacher-education courses (high school)	41*	41*

See *Required Courses for a High School Provisional Certificate* p.228

three high school units in one language can meet the requirement for this degree by successfully completing the second intermediate course in that language, or any single more advanced course in that language. A student with *two high school units in one language* can meet the requirement for this degree by successfully completing the first and second intermediate courses in the same language, or any single more advanced course in that language, or by completing the first full year of a second language. A student with two or three high school units in one language may repeat any elementary or intermediate course for University course credit if desired. A student with *one unit of high school language* can meet the requirement for this degree by taking the last elementary and both intermediate courses in that language, or the last elementary course in that language and the first full year of a second language, but receives no University credit for the last elementary course.* A student with *no units of high school language* must meet the requirement for this degree by taking both the elementary and intermediate courses in one language, or the first full year of each of two languages, but receives no University course credit for the elementary courses in one language. A student with two high school units in one language may elect to meet the requirement for this degree by successfully completing the entire elementary and intermediate series in a different foreign language with full University-level course credit.

For the Bachelor of Science degree: either three or four years of one high school foreign language, or two years of each of two high school foreign languages, satisfy the requirement, with no further study at the University level. A student with *two high school units in one foreign language* may meet the requirement for this degree either by taking the first intermediate course in the same language, or by taking the full first year of another foreign language. A student with two years of the same high school language may repeat any high school language course for University course credit if desired. A student with *one high school unit in a foreign language* may meet the requirement for this degree either by successfully completing the last elementary and the first intermediate courses in that language (but receives no University course credit for the last elementary course),* or by completing the entire elementary series and the first intermediate course in a different foreign language (without receiving University course credit for the last elementary course). A student with *no high school units in a foreign language* may meet the requirement for this degree either by taking the elementary courses and the first intermediate course in one foreign language (but receives no University course credit for the elementary courses), or by taking the elementary course sequences in each of two foreign languages (but receives University course credit for only one of these sequences).

The knowledge of the foreign language and its literature does not have to be the result of enrollment in classes; it may have been acquired through some other means. Students having acquired the knowledge of a foreign language through means other than course work, may elect to take a proficiency examination to fulfill part — or all — of the requirement, but they receive no course credit.† Detailed information about these examinations is available in the Department of Foreign Languages and Literatures. Only students who can show evidence of reasonable preparation will receive permission to take the examinations.

*Though a student who has had only one year in high school may go into the third quarter of the elementary course in college, such a step is usually inadvisable because of the difficulty of picking up the language again after an interruption and because of frequent differences in the order of material and method of approach. Should the student choose to repeat the first and/or the second elementary course, University course credit for those courses will be given.

†If the student wishes, as many as eight quarter hours may be given by paying the Fee for Credit by Examination. (*See Fees and Expenses.*)

COURSES OF INSTRUCTION AND CURRICULUMS‡

AMERICAN STUDIES

Associate Professor Dale (advisor).

Advisory Committee: Associate Professor C. Gay, English; Associate Professor Muntean, Sociology; Associate Professor Ronda, History; Associate Professor Shipka, Philosophy

The program for the combined major in American studies aims, in general terms, to provide a focus for a liberal education. Thus it can be used for almost any pre-professional training. The values of a good liberal education should be obvious to the individual planning on future graduate work in any of the humanities or the social sciences. The student expecting to enter foreign service will find this program particularly appropriate.

The major is designed so that the student will be stimulated to comprehend the student's own culture with realistic understanding and with critical detachment. Therefore, study will center on the multiplicity of America, learn its historical roots in Western civilization, and acquire enough knowledge of a culture in a foreign language to make meaningful comparisons.

For the combined major in American studies the following program is to be completed.

Option I:

A. Required courses:
   1. History 605, 606, 655, 656.
   2. English 613, 614.
   3. A foreign "civilization" course (such as German 712).
   4 Geography 627 or 722.
   5. American Studies 801-802-803.

B. One course from each of the following numbered groups:
   1. The humanities
      a. An Upper Division American literature course.
      b. English 650, 750, 755 or 756.
      c. Humanities 834.
      d. Philosophy 713, 715, 749, 811, 812, 820 or 830.
      e. Art 707, 709, 710 or 711.
   2. American history (Upper Division).
   3. Sociology, anthropology, or economics
      a. Sociology 500, 600, 602, 700, 707, 711, 716, 760, 761, 775, 787, 789 or 822.
      b. Economics 520, 621, 622, 708, 802, 806, 807 or 808.
   4. Political Science: A course in American or comparative government.

C. Four courses from any one of the groups under B, excluding those taken as fulfillments for B.

Upper Division Courses

801-802-803. *Perspectives on America.* a study of the American scene from differing points of view — cultural, political, social, economic. Prereq.: Senior standing. Required of seniors majoring in American studies; open to other seniors with consent of teacher. 3+3+3 q.h.

Option II:

A student interested in a particular problem within American society defined neither by a conventional major nor by Option I may before the end of the sophomore year work out with the advisor an individual pattern of courses appropriate to the problem. A student must initiate the proposal and show capability for better than average performance. A senior project, details to be worked out with the advisor, will be accomplished under this option.

ANCIENT LANGUAGES AND LITERATURE

See *Classical Studies.*

ANTHROPOLOGY

See *Sociology, Anthropology and Social Work.*

ASTRONOMY

Courses taken in astronomy may be applied toward a Bachelor of Science degree with a combined major in physics and astronomy. Refer to *Physics and Astronomy* for the program description.

Students interested in acquiring training in Planetarium operation should consult with the Director of the YSU Planetarium.

BIBLE

See *Philosophy and Religious Studies;* also *Humanities.*

‡The student should be familiar with the course-numbering system and its significance, as well as the abbreviations used to indicate the amount of credit. These are explained at the end of the General Requirements and Regulations section.

BIOLOGICAL SCIENCES

Professors Van Zandt (chairman), Kelley, Peterson, Schroeder and Sobota; Associate Professors Fishbeck, MacLean, Karas, Kreutzer, Toepfer, and Yemma; Assistant Professors Cannon, Chuey, Rufh, Sebastiani, Staudt, and Sturm; Instructor Brennan.

Courses taken in the Department of Biological Sciences may be applied toward a Bachelor of Arts or Bachelor of Science degree in biology. The department offers specialized study areas that provide information needed by students planning to enter the fields of botany, dentistry, elementary or secondary education, environmental studies, forestry, general biology, health-related careers, nursing, medicine, medical technology, microbiology, molecular biology or veterinary medicine. Suggested courses in the above disciplines are available from the department office or from any of the departmental advisors.

Refer to the Graduate Bulletin for a description of the Master of Science degree program in the biological sciences.

Lower Division Courses

504. *Human Evolution and Genetics.* Mendelian genetics as it applies to man and his evolutionary history, including the genetic problems and evolutionary relationships of mankind. Not applicable to the biology major. Four hours lecture per week. 4 q.h.

505. *Biology and Modern Man.* Findings, applications, and thinking of the science of biology as applied to problems today. Primarily for the science requirement. Not applicable to the biology major. Four hours lecture per week. 4 q.h.

506, 507, 508. *Principles of Biology I, II, III.* A laboratory course in general biology designed to provide comprehensive coverage of basic life science for students who require biology for entrance into various specialty schools. (Replaces Biol. 500, 501, 502.) Three hours lecture and two hours laboratory per week. 4+4+4 q.h.

551, 552. *Physiology and Anatomy of Man I, II.* Structure and function of the human organism. Prereq.: High school chemistry and biology or equivalent. Registration by permit only. Not applicable to the biology major. Three hours lecture and two hours laboratory per week; must be taken in sequence. 4+4 q.h.

560. *Paramedical Microbiology.* Characteristics, epidemiology, and pathology of viruses, rickettsiae, bacteria, and protozoa of medical significance. Not applicable to the biology major. Three hours lecture and one

REQUIREMENTS FOR MAJOR IN BIOLOGY[1]	Bachelor of Arts	Bachelor of Science
Required courses in Biology	506, 507, 508	506, 507, 508
Lower and Upper Division electives in Biology[2]	33 q.h.	41 q.h.
Chemistry	515, 516, 517	515, 516, 517
	Organic recommended	719, 720, 721
Physics	One year recommended	501, 502, 502L, 503, 503L
Mathematics	Statistics recommended	550, 714
Social Studies[3]	20 q.h.	20 q.h.
English Composition[3]	8 q.h.	8 q.h.
Humanities[3]	16 q.h.	16 q.h.
Language[3]	8 q.h.	4 q.h.
Electives[4]		

1 Students seeking admission to medically related professional schools should fulfill the B.S. requirement in biology.

2 Of the Lower and Upper Division elective hours listed for biology, 21 q.h. for the A.B. and 30 q.h. for the B.S. *must* be Upper Division electives. Courses numbered 700 and above in biology count toward Upper Division biology electives.

3 General University requirements; see Page 36 in this catalog for details.

4 Electives of student's choice may be taken from various departments in the University: earth science, computer science, advanced mathematics, and psychology are recommended.

three-hour lab discussion period per week. Prereq.: Registration by permit only. 5 q.h.

565. *Introductory Forestry.* An introduction to forestry in the United States. Contribution of forestry to the national economy. Discussion of the principles of forest tree management. Four hours lecture per week. Students who have taken Biol. 563, 564 will not receive credit for Biol. 565. 4 q.h.

599. *Orientation to Medicine.* An introduction to the philosophy of medicine through examination of ideas from the ancients to the modern. The Hippocratic Ideal, the Oath of Maimonides, the meaning of knowledge, humanism in medicine, independent thought in medicine, and the teaching of the uncertainty factor. One hour lecture per week. Prereq.: Admission to the NOUCOM-YSU program or consent of the instructor and the department chairman. 1 q.h.

604. *Food Microbiology.* Role of microbes in food preservation, fermentation, spoilage, sanitation, and food poisoning. Two hours lecture, four hours laboratory per week. Prereq.: Home economics major. Registration by permit only. 4 q.h.

661. *Economic Botany.* Enumeration, ecology, culture, distribution, use and biological significance of plants that serve useful purposes for man as food, fiber, wood, drugs, and ornament. Designed to fulfill University science requirement. Four hours lecture per week. 4 q.h.

665. *Coniferous Dendrology.* A study of the important species of Gymnosperms in the United States with emphasis on range, identification, and silvical characteristics. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 506 or consent of instructor. 4 q.h.

666. *Hardwood Dendrology.* A study of the major types of Angiosperms in the United States with emphasis on range, identification, and silvical characteristics. Two hours lecture and four hours laboratory per week. Prereq.: Biology 506 or consent of instructor. 4 q.h.

676. *Silvics.* The influence of location factors on forest cover and the effect of forest vegetation on the site. Two hours lecture and four hours laboratory per week. Prereq.: Biology 506 or consent of instructor. 4 q.h.

686. *Introductory Soil Science.* Fundamentals of the biological, chemical and physical properties which influence soil productivity. Laboratories include observation, evaluation and quantitative determination of soil properties which influence growth of crop and forest species. Three hours lecture and two hours laboratory per week. Prereq.: Chem. 516 or consent of instructor; Geology 505 recommended. 4 q.h.

692. *Human Sexuality.* An interdisciplinary approach to the study of human sexuality. Holistic approach dealing with questions that concern the college student of today. Includes problems in sex education, the nature of sexuality, the relationship of sex to personal identity, and sexual mobility. Factual information will be given in the areas of physiological reproduction, contraception, veneral disease, sexual dysfunctions, techniques, and response. Listed also as Health Education 692, Psychology 692 and Sociology and Anthropology 692. Prereq.: H & PE 590. 4 q.h.

Does not count toward General University requirements.

699. *Medical Applications Case Studies.* Applications of biological and chemical concepts in the practice of medicine. May be repeated to a total of three hours credit. Prereq.: Admission to NOUCOM-YSU program, or consent of instructor and department chairman. 1 q.h.

Upper Division Courses

700. *Non-Vascular Plants.* A presentation of classification, morphology, reproduction, ecology, and economic aspects of algae, fungi and mosses. Three hours lecture and four hours laboratory per week. Prereq.: Biol. 506,507,508. 5 q.h.

701. *Invertebrate Zoology.* Essentials of structure, function, and classification of invertebrates. Three hours lecture and four hours laboratory per week. Prereq.: Biol. 506, 507 and 508. 5 q.h.

702. *Microbiology.* Scope and evolution of microbiology, microscopy, anatomy, cultivation of bacteria, reproduction and growth, bacterial metabolism, microbial genetics, viruses, resistance and immunity, control. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 790 or consent of instructor or admission to NOUCOM-YSU program. 4 q.h.

703. *Clinical Immunology.* The basic fundamentals of antigen-antibody reactions applied to serological procedures performed in the clinical laboratory. Listed also as Medical Laboratory Technology 703. Must be taken concurrently with Biol. 703L. Prereq. Biol. 702. 2 q.h.

703L. *Clinical Immunology Laboratory.* Laboratory work includes VDRL, ASO, febrile, latex, pregnancy, and viral tests. Techniques practiced will include flocculation, precipitation, complement fixation and titration procedures used in the clinical laboratory. Three hours of laboratory per week. Listed also as Medical Laboratory Technology 703L. Must be taken concurrently with Biol. 703. 1 q.h.

710. *Mammalian Anatomy.* A composite study of the anatomical systems of mammals, based on the cat. Two hours lecture and four hours laboratory per week. Prereq.: Consent of instructor. 4 q.h.

713. *Vertebrate Histology.* The microscopic study of mammalian tissue. The course also includes histological techniques. Students will prepare their own slides for study. Three hours lecture and four hours laboratory per week. Prereq.: Biol. 710. 5 q.h.

721. *Genetics.* Genetic material, reproductive cycles, sex determination, mitosis, meiosis, Mendelism, probability, linkage, genes in populations, mutation, evolution. Four hours lecture per week. Prereq.: Biol. 506, 507 and 508 or admission to NOUCOM-YSU program or consent of instructor. 4 q.h.

721L. *Genetics Laboratory.* Experiments with subjects such as corn, fruit flies, and higher organisms; preparation and studies of chromosomes; crossing and mutation experiments statistically analyzed. Four hours laboratory per week. Prereq. or concurrently: Biology 721. 2 q.h.

762. *Field Botany.* Identification, ecology, and significance of local plants. Three hours lecture and four hours laboratory per week. Prereq.: Biol. 506, 507 and 508. 5 q.h.

765. *Vascular Plants.* Structure, function, reproduction, and phylogenetic relationships of representative vascular plants. Three hours lecture and four hours laboratory per week. Prereq.: Biol. 506,507,508. 5 q.h.

770. *Vertebrate Zoology.* Taxonomic presentation of phylum Chordata with emphasis on the relationships and significance of vertebrates. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 506, 507 and 508. 4 q.h.

771. *Entomology.* An introduction to the morphology, physiology, development, and control of insects. Laboratory includes a survey of insect orders and families. Three hours lecture and four hours laboratory per week. Prereq.: Biol. 506, 507 and 508. 5 q.h.

775. *Comparative Vertebrate Anatomy.* Comparison of morphology of vertebrates emphasizing evolutionary development of organ systems. Three hours lecture and four hours laboratory per week. Prereq.: Biol. 770 or consent of instructor. 5 q.h.

780. *Introduction to Ecology.* An introduction to study of principles governing the relationship of organisms to their environment. A holistic approach to ecology framed in the concepts of ecosystems. Three hours lecture and one three-hour laboratory discussion period per week. Prereq.: Biol. 506, 507 and 508. 5 q.h.

788. *Diagnostic Microbiology.* Clinical approach to the study of bacteria, fungi, and other microorganisms including the identification of organisms encountered in the clinical laboratory. Six hours of laboratory per week. Listed also as Medical Laboratory Technology 788. Prereq.: Biol. 702. 2 q.h.

789. *Man and the Technological Society.* An interdisciplinary critical examination of man in the modern technological society from the perspective of engineering, life, and social science. The topics will be (1) history of technology, (2) the world's available energy and material resources, (3) population dynamics as they interact with nature and the human ecosystem, such as "the green revolution," cybernation, value concepts, and techniques to forecast societal changes. Listed also as Sociology 789 and Chemical Engineering 789. Prereq.: Junior standing or consent of instructor. 4 q.h.

790. *Molecular-Cellular I.* Cellular and macromolecular function in relation to cell replication and its control, information theory, regulation of cellular activity, interaction between organelles and the nucleus and control of cellular differentiation. Two hours lecture and one three-hour lab discussion period per week. Prereq.: Biol. 506, 507, 508 and Chem 719 or admission to NOUCOM-YSU program or consent of instructor. 4 q.h.

801. *Environmental Microbiology.* The activities of microorganisms, primarily bacteria, in air, soil, water and sewage. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 702. 4 q.h.

803. *Population and Community Ecology.* Current concepts of animal population and community ecology including statistical analysis of field-collected data. Students who have had Biol. 802 will not receive credit for Biol. 803. Three hours lecture and four hours

laboratory per week. Prereq. Biol. 780 or consent of instructor. 5 q.h.

804. *Aquatic Ecology.* Ecological, physical, and chemical aspects of aquatic ecosystems. A study of interaction between aquatic organisms and their environment. Four hours lecture per week. Prereq.: Biol. 780 or consent of instructor. 4 q.h.

804L. *Aquatic Ecology Laboratory.* Field and laboratory studies of structure and function of selected aquatic ecosystems in northeastern Ohio. Four hours laboratory per week. Prereq. or concurrently: Biol. 804 or consent of instructor. 2 q.h.

805. *Ichthyology.* The ecology, evolution and taxonomy of fishes. Emphasis will be given to the fishes of the Midwestern United States. Three hours lecture and two hours laboratory per week. Prereq.: Biol. 780. 4 q.h.

808. *Embryology.* Identification of mechanisms: analysis of control of developmental events and processes. Interaction of egg and sperm, penetration and activation of the egg, theories of induction, models of tissue interaction, gene action and the fate of informational molecules during development. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 770 or consent of instructor or admission to the NOUCOM-YSU program. 4 q.h.

812. *Mycology.* Morphology, physiology, classification, ecology, economic and medical importance of the fungi. Laboratory will investigate morphology and physiology. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 702. 4 q.h.

819. *Taxonomy of Flowering Plants.* Phylogentics, systematics, geographical distribution and evolutionary development of herbaceous plants. Taxonomic systems based on morphology and biochemistry will be discussed. Extensive field collections will be required as part of laboratory exercises. Three hours lecture and four hours laboratory per week. Prereq.: Biol. 765. 5 q.h.

821. *Plant Anatomy.* Comparative anatomy and histology of the vascular plants. Three hours lecture and four hours laboratory per week. Prereq.: Biol. 506, 507 and 508 or consent of instructor. 5 q.h.

822. *Plant Physiology.* Physiochemical nature of life processes of plants. Three hours lecture and four hours laboratory per week. Prereq.: Biol. 506, 507, 508 and Chem. 517 or consent of instructor. 5 q.h.

823. *Advanced Genetics.* Modern concepts of the structure of the gene and the mechanisms of mutation and gene action. Four hours lecture per week. Prereq.: Biol. 721 or consent of instructor. 4 q.h.

824. *Bacterial and Viral Physiology.* Physiological processes of bacteria and viruses with emphasis on their relationship to disease. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 702. 4 q.h.

825. *Radioisotopes in Biology.* Application of radioactive isotopes as tracers of vital substances within biological systems. Students will apply autoradiography, liquid scintillation, and gas flow techniques to study uptake, movement, and biosynthesis of substances in biological systems. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 790. 4 q.h.

830. *Immunology.* Fundamentals of immunological systems, including both humoral and cellular immunological phenomena. Three hours lecture and four hours laboratory per week. Prereq.: Biol. 702 and Chem. 721. 5 q.h.

831. *Biological Seminar.* A study of the historical and contemporary literature in biology. Written and oral reports, roundtable discussions. Prereq.: Junior standing and consent of instructor. 2 q.h.

834. *Vertebrate Physiology I.* Study of structure and function at the cellular and subcellular level of nervous, muscular, and endocrine systems. Three hours lecture and two hours laboratory per week. Prereq.: Biol. 506, 507 and 508 or admission to NOUCOM-YSU program, or consent of instructor; permit required. 4 q.h.

835. *Vertebrate Physiology II.* Physiology of circulatory, respiratory, digestive and excretory systems. Three hours lecture and two hours laboratory per week. Prereq.: Biol. 834; permit required. 4 q.h.

836. *Molecular-Cellular II.* Physical limits, relationship of cell morphology to function, cell organization and structure, the physiochemical environment, bioenergetics, metabolism and membrane transport systems. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 790 or consent of instructor or admission to the NOUCOM-YSU program. 4 q.h.

837. *Cytology and Techniques.* A study of the structure and organization of protoplasm using current methods of preparing and observing living and fixed cells. Two hours lec-

ture and four hours laboratory per week. Students who have had Biol. 832 will not receive credit for Biol. 837. Prereq.: Chem. 721. 4 q.h.

838. *Biology of Enzymes.* Enzymes in biological systems and the inter-relationships of enzymes on metabolism, cell membrane function, and cellular development. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 836 and Chem. 721. 4 q.h.

841. *Animal Parasitology.* The biological implications of parasitism. Diagnostic procedures, morphology and life histories of the parasites of humans and domestic animals. Students who have taken Biol. 741 will not receive credit for this course. Two hours lecture and four hours laboratory per week. Prereq.: Consent of instructor. 4 q.h.

842. *Advanced Parasitology.* The host-parasite interphase at the evolutionary, ecological, physiological and molecular levels will be considered and a synthesis will be developed of the current concepts of the parasitic niche. Four hours lecture per week. Prereq.: Biol. 841. 4 q.h.

850. *Problems in Biology.* Special biological problems for which materials and equipment are available and for which the student is qualified. Available at all times. Prereq.: Recommendation of staff. 1-4 q.h.

853. *Biometry.* Application of fundamental theory and procedures to the statistical analysis of biological data. Four hours lecture per week. Prereq.: Consent of instructor. 4 q.h.

860. *Evolution.* Genetic and ecological forces of evolutionary process. Prereq.: Biol. 721. 4 q.h.

872. *Protozoology.* Morphology, phylogeny, and bionomics of protozoa. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 701 or consent of instructor. 4 q.h.

873. *Mammalogy.*The vertebrate class, Mammalia, will be covered in detail considering evolutionary development, taxonomic position and characteristics, geographical distribution, ecological interactions, and economic significance. Students will observe mammalian characteristics and make a personal representative collection of mammals as laboratory requirements. Students who have taken Biol. 772 cannot receive credit for this course. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 770. 4 q.h.

Advanced Degree Program—Forestry

A student may elect a B.S. at YSU with concentration in plant-related courses. Upon receiving the B.S., and if qualified, a master's program at many of the leading forestry and plant science schools may be pursued.

A student may also spend two years at YSU in pre-forestry in which he concentrates on forestry degree requirements prior to transferring to a school of forestry.

Many of the courses of the Department of Biological Sciences at YSU will apply toward degrees in the agricultural and plant sciences at other schools.

For further information about these forestry, plant science, and related agricultural programs please see the PRE-FORESTRY ADVISOR, Department of Biological Sciences.

Recommended curriculum meeting requirements of the medically related professional schools.[1]

BIOLOGY

506—Principles of Biology I
507—Principles of Biology II
508—Principles of Biology III
721—Genetics
790—Molecular-Cellular I
836—Molecular-Cellular II

Medical schools in general recommend the following Upper Division courses:

702—Microbiology
713—Vertebrate Histology
770—Vertebrate Zoology
775—Comparative Anatomy
808—Vertebrate Embryology
834—Vertebrate Physiology I
835—Vertebrate Physiology II

CHEMISTRY

515, 516, 517—General Chemistry
719, 720, 721—Organic Chemistry
603, 604—Quantitative Analysis
711, 712—Biochemistry

MATHEMATICS

503—Trigonometry
550—Introduction to Calculus
714—Probability and Statistics

[1] For general University requirements, see page 107 of this catalog.

PHYSICS

501, 502, 502L, 503, 503L—Fundamentals of Physics I, II, III

For the recommended curriculum leading to certification for high school teaching in the biological sciences, see the curriculum description in the School of Education section of this catalog.

For the recommended curriculums designed for degree programs in the related health sciences exclusive of nursing, see the College of Applied Science and Technology section of this catalog.

BLACK STUDIES

Associate Professor Bright (director); Franklin (counselor).

The Black Studies program was established in the fall of 1970 and a major was approved by the University Senate in the winter of 1972. The purpose of this inter-disciplinary major is to facilitate the academic investigation and analysis of the historical, social and aesthetic impact of the people of African descent on American society and the world. It also provides for the systematic study of the problems confronting the modern multi-ethnic world.

Major in Black Studies

The major in Black Studies is included in a program leading to the Bachelor of Arts degree and students electing this major must satisfy all requirements for the A.B. degree. The major must complete a minimum of *48* total hours from approved Black Studies courses. At least *28* hours must be in Upper Division courses. A grade of *C* or better is required in each course to be counted toward either the major or minor in Black Studies.

All Black Studies majors must complete the following courses:

1. Core Courses

Black Studies 600 ..... 4 q.h.
Black Studies Introduction I

Black Studies 601 ..... 4 q.h.
Black Studies Introduction II

Black Studies 700 ..... 4 q.h.
Black Studies Seminar

History 663 ..... 4 q.h.
African Civilization

16 q.h.

II. 8-16 hours from among the following social studies courses:

*American Studies 801, 802, 803 ..... 3+3+3 q.h.

Education 879 ..... 4 q.h.
Educational Sociology Seminar

Education 880 ..... 3 q.h.
Inner-City Educational Workshop

Geography 712 ..... 3 q.h.
Regional Geography of Black Africa

History 730 ..... 4 q.h.
Black Man in American History I

History 731 ..... 4 q.h.
Black Man in American History II

*History 801 ..... 4 q.h.
Select Problems in American History

History 820 ..... 4 q.h.
History of West Africa to 1800

History 821 ..... 4 q.h.
History of West Africa Since 1800

History 822 ..... 4 q.h.
History of Modern Africa South of the Sahara

*History 860 ..... 4 q.h.
Select Problems in Third World History

Political Science 706 ..... 3 q.h.
Minority Group Politics

Sociology-Anthropology 700 ..... 5 q.h.
Minority Groups

Sociology-Anthropology 726 ..... 4 q.h.
The Black Family

Sociology-Anthropology 727 ..... 4 q.h.
The Black Community

Sociology-Anthropology 770 ..... 4 q.h.
Anthropology: African Culture

Or other social studies courses when applicable and approved by the director of the Black Studies program.

III. 8-16 hours from among the following humanities courses:

Art 742 ..... 3 q.h.
African Art

English 620 ..... 4 q.h.
Introduction to African Literature

*English 699H ..... 4 q.h.
Honors Seminar, Landmarks in Literary History

English 871 ..... 4 q.h.
Black Man in American Literature

Philosophy/Religious Studies 740 ..... 4 q.h.
Black Church in America

Or other humanities courses when applicable and approved by the director of the Black Studies program.

IV. In addition to the minimum of 32 hours in Black Studies and in courses directly relevant to Black Studies, the major may include as many as 16 hours in any other courses that are approved by the director of the Black Studies program.

Suggested Minor

Twenty-one hours in courses in Black

Studies and/or courses directly relevant to Black Studies as listed in the catalog.

Lower Division Courses

600. *Introduction to Black Studies, I.* The social-historical experience of Black people in Africa and the Americas. This course is applicable to the University requirement in the social sciences. 4 q.h.

601. *Introduction to Black Studies, II.* The cultural and intellectual heritage of Black people in Africa and the Americas as reflected in literature, philosophy, and art. This course is applicable to the University requirement in the humanities. 4 q.h.

Upper Division Courses

700. A seminar in Black Studies focusing on the cultural, economic, educational, political, or social aspects of the experiences of peoples of African descent. Prereq.: Blk. St. 600 or 601 and consent of Black Studies director. May be repeated once. 4 q.h.

Courses offered in various departments that are applicable to the Black Studies major or minor are:**

American Studies 801, 802, 803. *Perspectives on America.* 3+3+3q.h.

Art 742. *African Art.* 3 q.h.

Education 879. *Educational Sociology Seminar.* 2-4 q.h.

Education 880. *Inner-City Educational Workshop.* 3 q.h.

English 620. *Introduction to African Literature.* 4 q.h.

English 699H. *Honors Seminar, Landmarks in Literary History.* 4 q.h.

English 871. *Black Man in American Literature.* 4 q.h.

Geography 712. *Regional Geography of Africa.* 3 q.h.

History 663. *African Civilization.* 4 q.h.

History 730. *Black Man in American History, I.* 4 q.h.

History 731. *Black Man in American History, II.* 4 q.h.

History 801. *Select problems in American History.* 4 q.h.

History 820. *History of West Africa to 1800.* 4 q.h.

History 821. *History of West Africa Since 1800.* 4 q.h.

History 822. *History of Modern Africa South of the Sahara.* 4 q.h.

History 860. *Select Problems in Third World History.* 4 q.h.

Philosophy/Religion 740. *Black Church in America.* 4 q.h.

Political Science 706. *Minority Group Politics.* 3 q.h.

Sociology 700. *Minority Groups.* 5 q.h.

Sociology 726. *The Black Family.* 4 q.h.

Sociology 727. *The Black Community.* 4 q.h.

Sociology 770. *Anthropology: African Cultures.* 4 q.h.

*When applicable and approved by the director of the Black Studies Program.

BOTANY

See *Biological Sciences.*

CHEMISTRY

Professors Cohen, Del Bene, Foldvary, Gebelein, Mahadeviah, Rand, Spiegel, Van Norman and von Ostwalden. Associate Professors Dobbelstein (chairman), Koknat, Lukin, Mettee, Phillips, Reeder, Schildcrout, F. W. Smith and Yingst.

The Bachelor of Science degree is recommended for those who plan to make a career in chemistry; a recommended program which meets the standards of the American Chemical Society is provided after the course descriptions. The Bachelor of Arts degree is recommended for those who plan to go into a medical or dental field and also for those who plan to enter careers in business or secondary education which are related to chemistry. The required courses for a B.S. degree with a major in chemistry are those listed in the B.S. curriculum. The courses required for an A.B. degree are those listed in the A.B. curriculum below. The recommended courses for an A.B. degree with a major in chemistry, meeting recommendations for preparation for the medically related professional schools are listed in the curriculum below. Chemistry majors who take Chemistry 501 need 190 q.h. for graduation.

Students in pre-professional programs such as pre-pharmacy and pre-optometry may obtain appropriate curriculums and advisement in the Chemistry Department.

Credit may not be received for more than one course or sequence of each of the following pairs: Chemistry 591, 592 or 515, 516, 517; Chemistry 791, 792, 793 or 719, 720, 721; Chemistry 796, 797 or 711, 712; Chemistry 801 or 739.

**For course descriptions and prerequisites, see respective departmental listings.

Lower Division Courses

501. *Survey of Chemistry I.* A one-quarter survey designed for those with little or no mathematics or science background. Important principles and modern concepts are discussed and illustrated using examples common to everyday experience. This course may be taken in partial fulfillment of the minimum science requirement for a baccalaureate degree. Chemistry 501 is not intended for chemistry majors. Four hours lecture; no laboratory. 4 q.h.

502, 503. *Survey of Chemistry II and III.** Continuation of Chemistry 501, with emphasis on the chemistry of living systems. These courses may be used to fulfill a part of the University science requirement but they are not intended for chemistry majors. Three hours lecture and three hours laboratory with discussion. Prereq.: Chemistry 501 or one unit of high school chemistry. 4+4 q.h.

510. *Survey of Chemistry Laboratory I.* Designed to accompany Chemistry 501 for those who desire laboratory experience. May be taken in partial fulfillment of the minimum science requirement for the baccalaureate degree. Not intended for chemistry majors. Three hours laboratory and discussions. Prereq. or concurrent: Chemistry 501. 1 q.h.

515, 516, 517. *General Chemistry I, II, III.** A course in the fundamental principles and a study of the more important elements and compounds, including qualitative analysis. Intended for majors in the natural sciences and engineering. Three hours lecture and a three-hour laboratory with discussions. Prereq.: For Chemistry 515—three units of high school algebra and geometry and either one unit of high school chemistry or Chemistry 501. 4+4+4 q.h.

515H, 516H, 517H. *General Chemistry I, II, III.** An honors course for selected students similar to General Chemistry 515, 516, 517, but presented in greater depth. Three hours lecture and three-hour laboratory with discussions. Prereq.: For 515H, same as General Chemistry 515, plus high ACT or SAT score and *A* or *B* grades in high school chemistry. For 516H, recommendation of the instructor in 515 or 515H. For 517H, recommendation of the instructor in 516 or 516H. 4+4+4 q.h.

591, 592. *Principles of Chemistry I, II.** Fundamental principles of chemistry and introduction to inorganic chemistry. Three hours lecture. Prereq.: Admission to the NOUCOM-YSU program or equivalent qualifications with consent of instructor and department chairman. Concurrent: Chemistry 593 for 591, 594 for 592. 3+3 q.h.

593, 594. *Principles of Chemistry Laboratory I, II.** Introduction to laboratory techniques, including inorganic chemistry and qualitative and quantitative analysis. Three hours laboratory including discussion. Concurrent: Chemistry 591 for 593, 592 for 594. 1+1 q.h.

603, 604. *Quantitative Analysis I, II.** A study of chemical equilibrium, stoichiometry, theory of errors, volumetric and gravimetric procedures as applied to quantitative determinations. Electroanalytical and colorimetric methods are introduced. The development of technique is emphasized in the laboratory; three hours lecture and six hours laboratory each week. Prereq.: Chemistry 517 or 592 for 603, Chemistry 603 or 692 for 604. 5+5 q.h.

691. *Introduction to Physical Chemistry.* Elements of thermodynamics, equilibria, states of matter, kinetics, and spectroscopy. Three hours lecture. Prereq.: Chemistry 592 or a 3.6 average in Chemistry 515, 516, 517, and Math. 681 or equivalent. 3 q.h.

692. *Instrumental Techniques.* The application of instrumentation in the study of chemical systems, including spectrometric, electrometric, chromatographic, and thermometric methds. Six hours laboratory including discussion. Concurrent: Chemistry 691. 2 q.h.

699. *Medical Application Case Studies.* Applications of biological and chemical concepts in the practice of medicine. May be repeated to a total of three hours credit. Prereq.: Admission to NOUCOM-YSU program or consent of the instructor and department chairman. 1 q.h.

Upper Division Courses

705. *Nutritional Biochemistry.* Emphasis is placed on the phases of biochemistry of special interest in home economics and dietetics. Credit cannot be received for this course if credit is received for any other biochemistry course. Three lectures and three hours laboratory with discussion. Prereq.: Chemistry 503. 4 q.h.

706. *Chemical Literature.* Examination of standard reference works and periodicals with written reports based upon technical writing procedures. Prereq.: Chemistry 721 or 793. 2 q.h.

*Must be taken in sequence.

711, 712. *Biochemistry I, II.** An introduction to the chemistry and metabolism of living organisms. Laboratory work is designed to illustrate modern biochemical methods. This course is primarily designed for medical technology and biology majors. Two hours lecture and three hours laboratory with discussions. Prereq.: Chemistry 603 or 692; Chemistry 721 or 793; and Biology 506, 507, and 508 or equivalent. 3+3 q.h.

713. *Clinical Biochemical Techniques.* Advanced clinical techniques designed for medical technology majors. Two three-hour laboratories per week. Prereq.: Chemistry 712 or 799. 2 q.h.

719, 720, 721. *Organic Chemistry I, II, III.** A systematic study of organic compounds, reactions, and theories. The laboratory includes typical preparations and procedures of analysis. Three hours lecture and three hours laboratory. Prereq.: Chemistry 517 or 592. 4+4+4 q.h.

729. *Inorganic Chemistry I.* The fundamental principles underlying the structure and properties of the elements and their compounds. Prereq.: Chemistry 740. 3 q.h.

730. *Clinical Radiochemistry.* An introductory and systematic study of radioisotopes in clinical practice. Three hours lecture. Prereq.: Chemistry 517 or 592. 3 q.h.

730L. *Clinical Radiochemistry Laboratory.* Methods of detection and measurements of radiation with emphasis on the development of techniques and safety in a clinical radiation laboratory. Three hours laboratory. Prereq. or concurrent: Chemistry 730. 1 q.h.

739, 740, 741. *Physical Chemistry I, II, III.** Principles and applications of physical chemistry. Three hours lecture and a three-hour laboratory. Prereq.: Chemistry 603 or 692; Phys. 611, 610L, 611L or Phys. 650, 502L, 503L; Prereq. or concurrent: Math. 674. 4+4+4 q.h.

791, 792, 793. *Principles of Organic Chemistry I, II, III.** A systematic study of organic compounds, reactions, and theories, including an introduction to biochemistry. Three hours lecture. Prereq.: Admission to NOUCOM-YSU program or consent of instructor and department chairman, and either Chemistry 592 concurrent or 515, 516 with *A*'s. Concurrent: Chemistry 794 for 791, 795 for 793. 3+3+3 q.h.

794, 795. *Principles of Organic Chemistry Laboratory I, II.** Introduction to synthetic and analytical procedures of organic chemistry. Three hours laboratory including discussion. Concurrent: Chemistry 791 for 794, 793 for 795. 1+1 q.h.

796. *Fundamentals of Biochemistry I.* Chemistry of amino acids, nucleic acids, enzymes, and coenzymes; biochemical energetics. Three hours lecture. Prereq.: Admission to NOUCOM-YSU program or consent of instructor and department chairman, plus Chemistry 691 or equivalent and either 721 or 793. 3 q.h.

797. *Fundamentals of Biochemistry II.* Metabolism of carbohydrates, lipids, proteins, and nucleic acids, with special emphasis on mammalian systems. Three hours lecture. Prereq.: Chemistry 796. 3 q.h.

798, 799. *Fundamentals of Biochemistry Laboratory I, II.** Analysis and separation techniques of biochemistry. Three hours laboratory including discussion. Prereq.: Chemistry 692 and 795 or equivalent. Concurrent: Chemistry 796 for 798, 797 for 799. 1+1 q.h.

801. *Elements of Physical Chemistry.* An introduction to thermodynamics, chemical structure, reaction rates and other physical properties of chemical systems. Applications in biology and health-related fields are emphasized. Credit will not be given for both Chemistry 801 and 739. Four hours lecture. Prereq.: Chemistry 517 or 691; Phys. 503; Math. 550 or 681; and senior standing. 4 q.h.

803, 804. *Chemical Instrumentation I, II.** A study of the theoretical foundations of instrumental procedures and the application and use of instruments in analytical work. Chemistry 803; two hours lecture and six hours laboratory. Chemistry 804; two hours lecture and three hours laboratory. Prereq.: Chemistry 604, 741. 4+3 q.h.

805. *Applied Spectroscopy.* A study of infrared, ultraviolet, nuclear magnetic resonance, electron spin resonance, mass spectrometry, and methods of current interest as applied to chemical systems. Three hours lecture. Prereq.: Chemistry 721 or 793; prereq. or concurrent. 741 or permission of instructor. 3 q.h.

813. *Thermodynamics and Kinetics.* Fundamentals of chemical thermodynamics and kinetics with applications in both ideal and real chemical systems. Three hours lecture. Prereq.: Chemistry 741. 3 q.h.

*Must be taken in sequence.

821. *Intermediate Organic Chemistry.* An introduction to advanced study in organic reactions and theories. Three hours lecture. Prereq.: Chemistry 721 or 793; prereq. or concurrent: 739 or 801. 3 q.h.

822. *Organic Analysis.* Qualitative and functional group analysis of organic compounds. Laboratory exercises and discussion of underlying principles. One hour lecture and six hours laboratory with discussions. Prereq.: Chemistry 721 or 795. 3 q.h.

823. *Organic Synthesis.* Preparations of organic compounds and applicable instrumental techniques. One hour lecture and six hours laboratory with discussions. Prereq.: Chemistry 721 or 795. 3 q.h.

824. *Polymer Chemistry.* Polymerization processes and polymer structure-property relationships. Students who have received credit for Chemistry 709 may not receive credit for this course. Prereq.: Chemistry 721 or 793. 3 q.h.

825. *Polymer Chemistry Laboratory.* The preparation and characterization of some polymers. One hour lecture and six hours laboratory. Prereq.: Chemistry 824. 3 q.h.

829, 830. *Inorganic Chemistry II and III.* (II) Current interpretations of the chemistry of nonmetals and pre-transition metals. (III) Transition metals and coordination compounds. Need not be taken in sequence. Prereq.: Chemistry 729, 741. 2+2 q.h.

831. *Inorganic Chemistry Laboratory.* The preparation of typical inorganic compounds and their characterization. Six hours laboratory with discussions. Prereq.: Chemistry 729; prereq. or concurrent: Chemistry 741. 2 q.h.

835. *Nuclear Chemistry and its Applications.* Nuclear structure and reactions, types of radioactive decay, radiation detection, measurements and techniques in handling radio-active materials. Prere.: Chemistry 740 or 801. 3 q.h.

836. *Chemical Bonding and Structure.* Applications of various bonding theories to molecular structure. Three hours lecture. Prereq.: Chemistry 741. 3 q.h.

850. *Undergraduate Research.* Research participation under the direction of a faculty member. May be repeated up to a maximum of nine q.h. Prereq.: Chemistry 603 or 719 and approval of the department chairman. 2 or 3 q.h. each quarter

* Must be taken in sequence.

852. *Chemistry Seminar.* Reports and discussions of research studies and problems. May be repeated. 1 q.h. each quarter

All students majoring in chemistry will be assigned a faculty advisor by the department. The advisor will discuss the overall curriculum necessary for a degree in chemistry and will assist the student in the preparation of a suitable course sequence.

All chemistry majors are urged to consult their advisors regularly to avoid curricular problems.

Recommended curriculum leading to a B.S. degree with a major in chemistry.

FIRST YEAR	Hrs.
Chemistry 515, 516, 517	12
English 550-551	8
Mathematics 571, 572, 673	14
Health and Physical Education 590	3
Electives (See note)	11
	48

SECOND YEAR	Hrs.
Chemistry 719, 720, 721	12
Chemistry 603, 604	10
Physics 510, 610, 610L, 611, 611L	14
Mathematics 674	4
Electives (See note)	5
	45

THIRD YEAR	Hrs.
Chemistry 739, 740, 741	12
Chemistry 729	3
Health and Physical Education Activity	3
Electives (See note)	30
	48

FOURTH YEAR	Hrs.
Chemistry 803, 804	7
Chemistry 829 or 830	2
Chemistry 822 or 823	3
Electives (See note)	33
	45

NOTE: These electives must include at least three quarter hours of chemistry laboratory, of which no more than one quarter hour may be Undergraduate Research (Chemistry 850). Three additional quarter hours of these electives must be either in 800-level chemistry or in Upper Division mathematics and physics. In addition, the electives must satisfy the general University requirements for Upper Division credit, the social studies, the humanities, and a minor, and must also satisfy the foreign language requirement of the College of Arts and Sciences. German is strongly recommended as a foreign language.

Recommended curriculum leading to an A.B. degree with a major in chemistry. Note (a)

FIRST YEAR	Hrs.
Chemistry 515, 516, 517	12
English 550-551	8
Mathematics 571, 572, 573	14
Health and Physical Education	3
Electives (See note (b) below)	11
	48

SECOND YEAR	Hrs.
Chemistry 719, 720, 721	12
Chemistry 603, 604	10
Mathematics 674	4
Physics 510, 610, 610L, 611, 611L	14
Electives (See note (b) below)	8
	48

THIRD YEAR	Hrs.
Chemistry 739, 740, 741	12
Chemistry 729	3
Health and Physical Education Activities	3
Electives (See note (b) below)	27

FOURTH YEAR	Hrs.
Electives (See note (b) below)	45

Note (a) This curriculum provides a minimum chemical background necessary to pursue career goals in business, secondary education and other technical fields. A full listing of suggested electives for several minors is available in the chemistry department office.

Note (b) The electives must satisfy the University requirements for Upper Division credit, the social studies, and the humanities, as well as the requirement in the College of Arts and Sciences for a foreign language.

Recommended curriculum leading to an A.B. degree with a major in chemistry, meeting recommendations for preparation for the medically related professional schools.

FIRST YEAR	Hrs.
Chemistry 515, 516, 517	12
English 550-551	8
Mathematics 571, 572	9
Biology 553 or 506, 507, 508	5 or 12
Health and Physical Education 590	3
Electives (See note below)	10 or 3
	47

SECOND YEAR	Hrs.
Chemistry 719, 720, 721	12
Chemistry 603, 604	10
Physics 510, 610, 610L, 611, 611L	14
Mathematics 673, 674	9
	45

THIRD YEAR	Hrs.
Chemistry 739, 740, 741	12
Biology 790, 721, 808	13
Chemistry 729	3
Health and Physical Education Activities	3
Electives (See note below)	16
	47

FOURTH YEAR	Hrs.
Biology 702, 834, 836	12
Electives (See note below)	35
	47

NOTE: The electives, in addition to satisfying the general University requirements with respect to Upper Division credit, the social studies, and the humanities, must fulfill the foreign language requirement in the College of Arts and Sciences.

CLASSICAL STUDIES*

Classical Studies courses, besides meeting the needs of certain majors and prospective Latin teachers, are intended to complement or supplement study in various other liberal arts subjects, satisfy certain pre-professional students' needs, and offer students in all fields opportunities to increase their acquaintance with important phases of Western culture and their significant products.

Courses in Latin are designed not only for Latin majors but also for majors in English, history, and the Romance languages who discover the desirability of knowing some Latin, or knowing more of it, and for pre-law, pre-medicine, and pre-seminary students. In addition, for students whose entrance language was Latin, Latin 601 and 602 provide the most expeditious means of completing the foreign language proficiency requirement.

Courses in ancient Greek primarily provide knowledge of the language of the people with whose curiosity, originality, and transmutations of older cultures Western civilization began; but attention is also given to matters which make them useful to Latin majors, pre-seminary students, pre-medicine students, and students with linguistic interests, as well as to those interested in still other aspects of Western culture and its origins.

Other Classical Studies courses seek, without requiring a knowledge of ancient languages, to inform the student on important aspects of Greek and Roman culture, intro-

duce the student to some of its influential products, and stimulate through analysis and discussion of these. The courses are designed to meet the needs of the general student and to supplement work in Latin, ancient Greek, and such fields as English, history, political science, philosophy, and art.

Majors are offered in Latin and in Classical Studies. The requirements for the Latin major are stated elsewhere with the Latin course descriptions. The major in Classical Studies is a combined major and consists of 70 quarter hours chosen from Classical Studies courses (including ancient Greek and Latin) and from certain courses in other departments. The student must consult the Advisor for Classical Studies before undertaking this major.

Classical Studies 631, 714, 715, 830, and 831 may be counted toward the University general requirement in the humanities area. Classical Studies 714, 715, 830, and 831 may also be counted toward the philosophy/theology/fine arts requirement for teacher certification.

Greek (Ancient)

For the numbers and descriptions of ancient Greek courses, see *Greek*, further on in the College of Arts and Sciences section.

Latin

For the numbers and descriptions of Latin courses, their prerequisites, and the requirements for the Latin major, see *Latin*, further on in the College of Arts and Sciences section.

Classical Studies

The following courses require no knowledge of Greek or Latin.

Lower Division Course

631. *Mythology in Literature.* An introductory study of myths, chiefly classical, with some attention to their origins and cultural significance, and of literary works, both classical and modern, in which these myths are used. Prereq.: English 551 or equivalent, with grade of *C*. Listed also as Humanities 631 and English 631. 3 q.h.

Upper Division Courses

714. *Ancient Art I.* A survey of the art and architecture of the ancient Near East, Crete, and Greece to the classical period, with attention to the civilization in which they were produced. No previous training in art or ancient languages is required. Listed also as Art 714. 3 q.h.

715. *Ancient Art II.* The art and architecture of classical and Hellenistic Greece and the Roman world, and their relation to the civilizations in which they were produced and to earlier art. No previous training in art or ancient languages is required. Listed also as Art 715. 3 q.h.

752. *History of Ancient Greece.* Identical with History 752. Prereq.: History 655, or consent of teacher. 4 q.h.

753. *History of Ancient Rome.* Identical with History 753. Prereq.: History 655, or consent of teacher. 4 q.h.

830. *The Western Tradition: Ancient Drama.* Readings in English from most or all of the following: Aeschylus, Sophocles, Euripides, Aristophanes, *Job*, Aristotle's *Poetics*, Menander, Plautus, Terence, Horace's *Art of Poetry*, Seneca. Prereq.: Classical Studies 631, or any literature course in English or Humanities; or junior or senior standing; or consent of the Advisor for Classical Studies. Listed also as Humanities 830 and English 830. 4 q.h.

831. *The Western Tradition: Ancient Prose and Poetry.* Readings in English from such writers as Homer, Herodotus, Thucydides, Plato, Aristotle, Lucretius, Cicero, Vergil. Prereq.: Classical Studies 631, or any literature course in English or Humanities; or junior or senior standing; or consent of the Advisor for Classical Studies. Listed also as Humanities 831 and English 831. 4 q.h.

COMBINED B.S./M.D. PROGRAM

See *The Northeastern Ohio Universities College of Medicine.*
of Medicine.

COMBINED SCIENCE

A combined science major leading to the Bachelor of Arts or Bachelor of Science degree consists of a minimum of 70 q.h. of science courses distributed as follows:

(1) At least 30 q.h. in biology, chemistry, geology or physics, with 12 q.h. in each of two other sciences listed above.

(2) An additional 16 q.h. which may be in any of the sciences listed above, or in other related courses such as astronomy, mathematics or meteorology.

The student must also satisfy all other requirements for the degree as described under the heading *Requirements for the Degrees* at

the beginning of the College of Arts and Sciences section.

Students who elect this major are advised by the science department in which they plan to receive the largest number of quarter hours of credit.

COMPUTER SCIENCE

See *Mathematical and Computer Sciences.*

EARTH SCIENCE

Associate Professor I. Khawaja (supervisor).

Earth science may be the major for the degree Bachelor of Arts or Bachelor of Science in Education.

The combined major in earth science is designed to meet the needs of students desiring a broad background in earth science. The major also provides the necessary background for graduate school and for a teaching field in earth science.*

An earth science major consists of a minimum of 70 quarter hours of science courses distributed as follows:

a) 50 quarter hours of required courses.

b) A minimum of nine quarter hours from at least two courses from Geology electives, and

3) A minimum of 11 quarter hours from Science electives.

Courses for Earth Science Major:

Required

Astronomy	504 Descriptive Astronomy	4
Astronomy	608 Moon and Planets	4
Chemistry	515 General Chemistry I	4
Geography	625 General Meteorology	4
Geology	505 Physcial Geology	4
Geology	506 Historical Geology	4
Geology	602 Intro. to Oceanography	4
Geology	604 Megascopic Petrography	6
Geology	607 Geology Laboratory	4
Geology	701 Geomorphology	6
Geology	705 Prin. of Paleontology	6

Geology Electives

702 Glacial Geology	5
703 Physiography of the United States	6
704 Structural Geology	5
706 Geology of Economic Mineral Deposits	5
801 Mineralogy	6
802 Stratigraphy and Sedimentation	5
811 Environmental Geology	4
and a 700 or 800 level accredited field geology course	3-8

*Interested students should consult with the Geology Department chairman.

Science Electives

Biology	508** Prin. of Biology III	4
Biology	506 Prin. of Biology I	4
Biology	507 Prin. of Biology II	4
Chemistry	516 General Chemistry II	4
Geography	603 Conservation of Natural Resources	4
Geology	707 Applied Geophysics	4
Mathematics	714 Probability and Statistics	5
Physics	501 Fundamental of Physics I	4
Physics	502 Fundamentals of Physics II	3
Physics	503 Fundamentals of Physics III	3
Physics	502L Fundamentals of Physics Lab II	1
Physics	503L Fundamentals of Physics Lab III	1

**Recomended

ECONOMICS

Professors Mackall (chairman), Hahn, Kermani, Niemi, and Stocks; Associate Professors Koss, Liu, Mehra, Milley, Ronaghy and Smythe; Assistant Professors Bee, Morris, and Shipman.

A major in economics consists of 48 quarter hours. Required courses are 520, 621, 622; 624, 705, 706; 710, 712.

Two of the following courses may be applied toward a major in economics: History 715, 716, 783, 784, and Marketing 624. The major is designed to prepare students for research and statistical work in business and government service; to provide a background for careers in business or government; and for graduate study leading to careers in law, journalism, government and international affairs, teaching, industrial relations, and business economics.

Lower Division Courses

510. *Economic Theory and the Individual.* Micro-theory's relation to the market place decisions. The micro-economic theories of utility maximization, savings, individual capital formation, cost structures and information costs will be taught as they relate to an individual in today's economy. 4 q.h.

520. *Principles of Economics I.* (Formerly 500). Basic principles of economics with emphasis on macro-economics. Introduction to demand and supply analysis. Emphasis on employment theory, and fiscal and monetary policy. 3 q.h.

621. *Principles of Economics II.* (Formerly 603). Basic principles of economics with emphasis on micro-economics. Analysis of market structures of industry, price and out-

put determination, resource allocation, pricing and employment of resources. Prereq.: 520. 3 q.h.

621H. *Principles of Economics II, Honors.* A honors course in micro-economics with more emphasis on the analytical aspects and methods in economics than Economics 621 provides. Prereq.: Economics 520 completed with a *B* grade or better. 3 q.h.

622. *Principles of Economics III. (Formerly 602.)* Economic problems in labor, agriculture, competition and monopoly, social welfare, urban environment, growth, international trade and finance, underdeveloped countries, poverty, and comparative economic systems. Prereq.: 621. 4 q.h.

622H. *Principles of Economics III, Honors.* A honors course in Principles III emphasizing additional reading and independent research on economic problems. Prereq.: Economics 621 or 621H completed with a *B* grade or better. 4 q.h.

624. *Economics and Social Statistics I. (Formerly 704.)* Probability theory with emphasis upon uncertainty in estimating parameters and testing hypotheses. The evaluation of single samples for purposes of estimating and testing. (This course replaces Economics 704.) Prereq.: Sophomore standing. 4 q.h.

Upper Division Courses

701. *Money and Banking.* Organization and operation of commercial banking in the United States; central banking under the Federal Reserve System; basic monetary theory. Study of the techniques of monetary policy with emphasis on its role as a determinant of the level of national income. Prereq.: Economics 622 or 603. 4 q.h.

702. *Public Finance.* The development and present status of public finance; federal, state, and local expenditures and taxation; theories of tax incidence, axioms of taxation, theories in justification of taxation and government spending; tax reform. Study of the techniques of fiscal policy with emphasis on its role as a determinant of the level of national income. Prereq.: Economics 622 or 603. 4 q.h.

705. *Economics and Social Statistics II.* Continuation of estimating and testing with emphasis on small sampling techniques. Correlation, regression, index numbers, time series with estimating and testing techniques used where applicable. Prereq.: Economics 624. 3 q.h.

706. *Economics and Social Statistics III.* Various sample methods as applied to business and economic purposes in estimating and testing. Introduction to analysis of variance, chi-square, etc. Prereq.: Economics 705. 3 q.h.

707. *Economics for Engineers. (Formerly Economics of American Industry.)* A study of American manufacturing: the evolution of major industries, and their technological and economic growth, maturity, current problems, and outlook for the future. Prereq.: Junior or senior standing. Not for economics and School of Business majors. 4 q.h.

708. *Economics of American Industry.* A study of American manufacturing: the evolution of major industries, and their technological and economic growth, maturity, current problems, and outlook for the future. Special emphasis is given to price theory and growth, as applied to industries. Prereq.: Economics 622 or 603. 3 q.h.

709. *Mathematical Economics.* A course designed to give students of economics a mathematical background with special emphasis on the theory of functions of real variables, and presentation of the fundamentals of differential and integral calculus as applicable to the macro- and micro-economic theory. Prereq.: Economics 622 or 603. (F). 4 q.h.

710. *Intermediate Micro-economic Theory.* A systematic analysis of the theory of demand and the theory of the firm: production input and output choices, and some basic concepts of linear programming. An intensive analysis of the theory of the firm: competitive pricing; monopoly pricing; pricing in imperfect competition; and the theory of rent, profits, interest, and wages. Prereq.: Economics 622 or 603 and either Economics 709 or Math. 550. (Sp) 5 q.h.

712. *Intermediate Macro-economics.* A study of the construction of national income and production accounts and the basic determinants of income, output, and employment. Determination of the level of employment, interest and money through the classical versus Keynesian aggregative economics. Role of money, wages, and prices in the theory of employment. Macro model building. Prereq.: Economics 622 or 603 and either Economics 709 or Math. 550. (W) 5 q.h.

724. *Economics of Public Utilities.* An analysis of the economic and legal bases of the public utility concept with emphasis on wel-

fare and resource impcications of the rate-making process. The effectiveness of commission control. Problems in electric, natural gas and telephone utilities, and a survey of river-basin and public power development. Prereq.: Economics 702 or 708 or 710. 4 q.h.

729. *Evaluation of Community Health Services.* Cross-listed and identical with Sociology/Anthropology 729. An interdisciplinary clinical course taught jointly by the departments of Economics, Geography, Political Science and Sociology/Anthropology. Prereq.: Junior standing or admission to NOUCOM-YSU program. 8 q.h.

787. *Population Movements.* Trends in world population in their relation to history, migration, and urbanization. Human demography and ecology: various measurements of the size, density, and distribution of population as well as their economic and social environments. Prereq.: Junior standing.(W) 4 q.h.

801. *Economics of Industrial Organization.* (Formerly Economics 803.) A systematic analysis of the structure, conduct, and performance of American industry. Special emphasis will be given to a quantitative analysis, complemented by a comprehensive review of the theoretical models of the market, firm behavior, and performance. Prereq.: Economics 622 or 603. 4 q.h.

802. *Comparative Economic Systems.* A study of a number of major economic systems, including capitalism, socialism, and others, giving particular attention to basic processes such as resource allocation and product distribution. References will be made throughout the study to some of the existing cases such as the U.S., U.S.S.R., Britain, etc. Prereq.: Economics 622 or 603. (W) 4 q.h.

803R. *Business and Government.* An analysis of the influence of the common law and the development, the growth, and the present status of competition; imperfect competition, and monopoly in the American economy. Prereq.: Economics 801 or consent of the instructor. 4 q.h.

804. *The Economics of Central Planning.* History and development of centrally planned type economies as a substitute for decentralized market systems; theories of central planning; their analysis and evaluation; central planning and its operation in a selected command type economy such as the Soviet Union, Red China, Yugoslavia. The above analysis will be made in reference to a particular command type economy which will be selected in advance as the topic for the quarter. Prereq.: Economics 622 or 603 or consent of instructor. (Sp) 4 q.h.

805. *Business Cycles and Economic Growth.* Study of the nature, causes, and measurements of economic fluctuation. Cycle theories with special emphasis on the multiplier-accelerator models, growth models of Harrod and Domar variety, and the use of difference and differential equations to study the generation of business cycles as a part of the growth process. Prereq.: Economics 712 or consent of the instructor. (Sp) 4 q.h.

806. *History of Economic Thought I.* Ancient beginnings, the Middle Ages, Mercantilism, the Physiocrats, the forerunners of Adam Smith, English classical school, and Utilitarianism. Prereq.: Economics 622 or 603. 3 q.h.

807. *History of Economic Thought II.* Early socialist thought, Karl Marx and Revisionism, the German Historical school and the early Marginalist school. Prereq.: Economics 622 or 603. 3 q.h.

808. *History of Economic Thought III.* Alfred Marshall, mathematical economics, early American economists, the Institutional school, monetary and welfare economists, the Keynesian school and modern theories of economic development and growth. Prereq.: Economics 622 or 603. 3 q.h.

809. *Current Problems in Money, Banking and Financial Markets.* Emphasis on understanding of the financial market system including money and capital markets in the economy. Current problems are associated with trends in theory and practice. Among topics covered are theories of the interest rate and monetarism. Prereq.: Economics 701 or consent of the instructor. 4 q.h.

810. *Managerial Economics. (Formerly Business Economics.)* An application of economic analysis to the solution of business problems. Emphasis upon executive decisions for the allocation of resources. Prereq.: Economics 622 or 603. 4 q.h.

811. *Theory of International Trade.* Theory of international specialization, world trade and development; commercial policies and international economic relations; some references to the international balance of payments (with emphasis on current accounts), exchange rates, and payment mechanism. Prereq.: Economics 622 or 603. 3 q.h.

812. *International Finance and Capital Movements.* Theories of international values, mechanism of adjustment of international balances; theories of foreign exchange and capital movements; theories concerning interrelation between price level, balance of payments, and capital movements; international aspects of monetary and banking theory. Prereq.: Economics 622 or 603. 3 q.h.

813. *Economic Development.* Theories of economic growth as applied to developing economies; study and analysis of the nature of, the obstacles to, and the future possibilities for accelerated economic growth in underdeveloped nations; the economic effects of international movements of capital and intergovernmental economic assistance. Prereq.: Economics 812 or consent of instructor. 3 q.h.

820. *Regional Economic Analysis.* A study of the forces that promote or deter the growth of a region and the techniques available for measuring and projecting regional development. Major emphasis is placed upon inter- and intra-regional migration patterns, economic base analysis, shift and share measurement, regional income estimation, input-output techniques, local multipliers and cyclical behavior, and the role of economic and social overhead capital in regional growth. Prereq.: Economics 622 or 603. 4 q.h.

821. *Location Theory.* An analysis of the economic considerations which do much to explain the locational patterns of individual business firms within regions of the U.S. and of the forces promoting agglomeration of firms. Stress is placed upon the relative importance of material and human resource inputs, the market for outputs, and the quantity and quality of economic and social overhead capital in attracting different types of firms to a region. In addition, the concepts of external and internal economies of scale, intermunicipal cost precipitation, and external costs and benefits are explored in order to approximate the optimum spatial extent for the provision of public goods and services. Prereq.: Economics 820. (W) 4 q.h.

822. *Urban Economics.* Economic analysis of the problems of urbanized areas. Benefit-cost and micro-economic techniques are used to explore urban unemployment, education expenditures, traffic congestion, environment, housing problems, and the economic development of urban centers. Prereq.: Economics 622 and one of the following: 624, 702 or consent of the instructor. 4 q.h.

824. *Applied Time Series Analysis of Economic & Business Data.* An in-depth analysis of time series models and their applications to problems in economics and business. Emphasis on forecasting. Extensive use of standard computer programs. Prereq.: Econoomics 621 and 705. 4 q.h.

825. *Economic and Business Data Alanysis.* An introduction to the applications of various data analysis techniques for confirming as well as exploring structural relationships among social and economic variables. Topics include interpretation of multiple regression and analysis of variance discriminant analysis and canonical correlation, principal component analysis, factor analysis and others. The course emphasizes the correct uses of these techniques and the analysis of computer printouts using computer-program packages. Prereq.: Economics 621 and 705. 4 q.h.

831. *Labor Markets.* Economic theory and analysis of labor as an input in the resource market; principles, labor problems, public policy; theories of the development of the labor movement; economic objectives of trade unions, problems in public control. Prereq.: Economics 622 or 603. 4 q.h.

833. *Collective Bargaining and Arbitration.* Marginal productivity theory as a restraint in labor negotiations; theory and practice of collective bargaining; bilateral monopoly, countervailing power, and third party involvement; Macro-economic implications of bilateral conflict resolutions, analysis of government wage-price guidelines and control. Prereq.: Economics 622 or 603. 4 q.h.

835. *Labor Legislation.* Development of labor law in the U.S.; analysis and economic implications of the effects of the common law, legislative enactments, judicial decisions, and administrative rulings on labor management relations, public policy, and problems of implementation. Prereq.: Economics 622 or 603. 4 q.h.

853. *Applied Econemetrics.* Construction and estimation of economic models with public and business applications. Methods of translating economic behavior into models; means of overcoming problems of estimation. Standard computer programs will be used. Programming ability is not required. Prereq.: Economics 621 and 705. 4 q.h.

899. *Individual Study in Economics.* A course for a student wanting to pursue a study of a topic, area, or problem in econom-

ics requiring in-depth reading, and a written project. The course may be repeated once for a different topic, area, or problem. Prereq.: Junior or senior standing; consent of instructor and department chairman. 2-5 q.h.

CURRICULUMS

The following curriculums all lead to the degree of Bachelor of Arts with a major in economics.

SPECIALIZATION IN INTERNATIONAL TRADE

FIRST YEAR	Hrs.
Econ. 520 Principles I	3
Engl. 550-551 Basic Composition I-II	8
Math. 550 Intro. to Calculus	5
Science Requirement	4
Social Studies Requirement	8
Humanities Requirement	4
Foreign Language or Elective	12
H&PE Activity Courses	3
	47

SECOND YEAR	Hrs.
Econ. 621, 622 Principles II, III	7
Econ. 701, Money and Banking	4
Comp. Sci. 600, Intro. to Program.	4
Social Studies	12
Humanities Requirement	4
Foreign Language or Elective	8

Courses in geography, anthropology, history or political science are recommended for a minor or as electives.

Science Requirement	4
H&PE 590 Health Education	3
	46

THIRD YEAR	Hrs.
Econ. 702, Public Finance	4
Econ. 624,705,706, Statistics I, II, III	10
Econ. 709 Mathematical Economics	4
Econ. 710 Intermediate Micro	5
Econ. 712 Intermediate Macro	5
Humanities Requirement	8
Science Requirement	4
Minor or Elective	8
	48

FOURTH YEAR	Hrs.
Econ. 802 Comparative Systems	4
Econ. 787 or 803 Population	4
Econ. 810 Managerial Economics	4
Econ. 811 Theory of Int'l Trade	3
Econ. 812 Int'l Finance	3
Econ. 813 Economic Development	3
Econ. 820 Regional Economic Analysis	4
Econ. 899 Individual Study	4
Mktg. 845 Int'l Marktg. or Elective	4
Elective or minor	15
	48

SPECIALIZATION IN MONEY AND BANKING

FIRST YEAR	Hrs.
Econ. 520, 621 Principles I, II	6
Engl. 550-551 Basic Composition I-II	8
Math 550 or 570 Intro. to Calculus or Applied Math I	4-5
Comp. Sci. 600 Intro. to Program.	4
Humanities Requirement	8
H&PE Activity Courses	3
H&PE 590 Health Education	3
Foreign Language or Electives	12
	48-49

SECOND YEAR	Hrs.
Econ. 622, Principles III	4
Acctg. 605, 606 Elem. Acctg. I, II	10
Econ. 624 Statistics I	4
Humanities Requirement	6
Science Requirement	12
Comp. Sci. 601 Advanced Program.	5
Foreign Language or Electives	8
	49

THIRD YEAR	Hrs.
Comp. Sci. 620, Computers and Programming	5
Comp. Sci. 700, Data Structures	4
Econ. 701 Money & Banking	4
Econ. 702 Public Finance	4
Econ. 705 Statistics II	3
Econ. 706 Statistics III	3
Econ. 710 Intermediate Micro	5
Econ. 712 Intermediate Macro	5
Electives	14
	47

FOURTH YEAR	Hrs.
Acctg. 701-702 Intermediate Accounting I & II	10
Comp. Sci. 701 Systems Program.	5
Econ. 809 Current Problems	4
Econ. 812 Int'l Finance	3
Fin. 720 Business Finance	4
Fin. 835 Advanced Business Finance	4
Electives	17
	47

SPECIALIZATION IN REGIONAL AND URBAN ANALYSIS*

FIRST YEAR	Hrs.
Econ. 520 Principles I	3
Engl. 550-551 Basic Composition I-II	8
Geog. 519 Intro. to Econ. Geography	4

Humanities Requirement	7
Math 550 Intro. to Calculus	5
Science Requirement	12
H&PE Activity Courses	3
H&PE 590 Health Education	3
Electives	3
	48

SECOND YEAR	Hrs.
Comp. Tech. 601, 602, Scientific Programming I, II	8
Econ. 621, 622 Principles II, III	7
Econ. 624 Statistics I	4
Humanities Requirement	7
History 605, 606 History of U S I, II	8
Pol. Sci. 601 American Gov't	4
Foreign Language or Electives	8-12
	46-50

THIRD YEAR	Hrs.
Econ. 705, 706 Statistics II, III	6
Econ. 710 Intermediate Micro	5
Econ. 712 Intermediate Macro	5
Geog. 627 Geography of U S	4
Geog. 726 Urban Geography	4
History 715, 716 Economic History of the U S I, II	8
Pol. Sci. 706 Minority Group Politics	3
Pol. Sci. 721 Urban Government	3
Foreign Language or Electives	8
	46

FOURTH YEAR	Hrs.
Econ. 702 Public Finance	4
Econ. 820 Regional Analysis	4
Econ. 821 Location Theory	4
Econ. 822 Urban Economics	4
Geog. 808 Land Use & Transportation	4
Geog. 809 City & Regional Planning	4
History 736 Urban History	4
Pol. Sci. 722 State & Local Gov't.	3
Electives	15
	46

SPECIALIZATION IN QUANTITATIVE METHODS

FIRST YEAR	Hrs.
Econ. 520, 621, 622 Principles, I, II, III	10
Engl. 550-551 Basic Composition I, II	8
Humanities Requirement	8
Science Requirement	8
H&PE Activity Courses	3
H&PE 590 Health Education	3
Foreign Language or Electives	6
	46

SECOND YEAR	Hrs.
Comp. Tech. 601, 602, Scientific Programming I, II	8
Econ. 624,705,706, Statistics I, II, III	10
Humanities Requirement	6
Math 550 Intro. to Calculus	5
Mktg. 624 Fund. of Marketing	5
Foreign Language or Electives	14
	48

THIRD YEAR	Hrs.
Econ. 701 Money and Banking	4
Econ. 710 Intermediate Micro	5
Econ. 712 Intermediate Macro	5
Econ. 709 Mathematical Economics	4
Mgmt. 837 Management Science	4
Math 685 Applied Matrix Algebra	4
Foreign Language or Electives	20
	46

FOURTH YEAR	Hrs.
Economics 702, Public Finance	4
Econ. 811 Int'l Trade	3
Mktg. 815 Marketing Research	4
Math 743, 744 Mathematical Statistics I, II	8
Electives	28
	47

*Students taking a specialization in regional and urban analysis should consider participation in the Urban Internship program under the direction of Professor Ivis Boyer of the Political Science and Social Science Department. This program offers on-the-job training in local governmental units in the Youngstown area as well as financial assistance to those selected.

ENGLISH

Professors Hankey, Hare, Kelty, McCracken, and Secrist; Associate Professors Baird, Brothers (chairman), Budge, C. Gay, T. Gay, Henke, Houck, Murphy, Sniderman, and Solimine; Assistant Professors Copeland, Crites, Gubser, Knapp, J. Mason, Schafer, Schultz, and Wilkinson; Instructors Clark, Martindale, S. Mason, Nash, and Van Gorder.

Beyond the freshman composition sequence, English majors are expected to complete 45 hours including course work in the following areas:

LINGUISTICS: 755 and 757 or 758 or 759;

ADVANCED COMPOSITION: 740 or 746 or 747 or 715;

MAJOR FIGURES: 760 or 761 or 783 or 860;

PERIOD COURSES IN BRITISH LITERATURE: 881 or 884 or 887 or 891; GENRE COURSES: 777 or 778 or 865 or 868 or 895;

AMERICAN LITERATURE: 771 or 772 or 775 or 871 or 815.

Only those courses for which the student has done *C* or better work will count toward the 45 hours needed for the major, but distribution requirements for the major may be fulfilled with courses for which the student has done *D* work.

In addition, all English majors must show evidence of having written a term paper of approximately 3000 words in any Upper Division literature course offered by the English Department. It must concern itself with a literary subject, deal principally with primary sources, be documented according to the *MLA Style Sheet*, and have been given at least a *C*-. The student may choose any papers that meet this requirement, or may request that one be assigned in any Upper Division literature course the student is enrolled in even when such a paper is not a regular part of the course work. The actual paper, with the professor's grade and comments on it, must be on file in the English Office by the beginning of the final quarter before the student's graduation, certified that it meets this requirement by the signature of the faculty member concerned.

Students who plan to teach high school English should major in English and complete the requirements for certification, including Education 800E, a course in developmental reading, and a course in mathematics. All advising of students working for certification in English is the responsibility of those faculty members jointly appointed to the English Department and the Department of Secondary Education; they can be reached through the English Department secretaries.

Literature courses (except 708, 709, 710) satisfy the general course requirement in the area of the humanities, but courses in linguistics and composition do not.

The completion of English 550 and 551 or their equivalents is prerequisite to all other English courses — except 610, 615, and 616, which may be taken by students with sophomore standing who have completed English 550. Unless the student has already had one, English 600 is the prerequisite to all Upper Division literature courses (except 708, 709, and 710). Under special circumstances, however, the department chairman may grant permission to take Upper Division courses without the prerequisite.

Foreign students whose first language is not English may get credit towards graduation for English courses in which their teacher feels that the general objectives of the courses have been achieved, even though the student's written English may not be entirely satisfactory in the mechanics of written expression. However, this credit will be entered on the student's permanent record without the usual letter grade, with an indication that credit has been allowed and with a notation on his final transcript which will make clear the reasons for the exception.

A *Manual for English Majors* is available at the English Department office.

International Students' Courses

510. *English for Foreign Students.* An intensive course in speaking, comprehending, reading and writing English as a second language, designed for foreign students whose knowledge of English is not yet adequate for the needs of the college classroom. In addition to the six class hours a week, students taking only English 510 must attend the Listening Laboratory, the Reading Laboratory, and the Writing Laboratory — each five hours a week; those taking other courses will have their laboratory hours adjusted according to their class load and their level of proficiency. May be repeated as many times as necessary to achieve a satisfactory level of proficiency. *Does not count toward a degree.*
6 q.h.

511. *Individual Instruction in English for Foreign Students.* Individualized attention to special problems for non-native speakers of English. Students are divided into two sections by the instructor: Section I concentrates on drills in pronuncation and grammatical constructions; Section II focuses on problems in written composition and vocabulary expansion. May be repeated as many times as necessary to achieve a satisfactory level of proficiency. *Does not count toward a degree.*
3 q.h.

Lower Division Courses

540. *Critical Reading of Expository Prose.* Designed to teach students to determine the central idea, the primary supporting ideas, and the organizational patterns of a piece of writing; to help them distinguish essential from non-essential points, literal from non-literal statements, generalizations from particulars, facts from judgments; and to encour-

age them to respond to elements such as tone, point of view, and style that affect the meaning of the whole. *Does not count toward the English major or the graduation requirement in humanities.* 4 q.h.

550, 551. *Basic Composition I-II.* A course attempting to improve the effectiveness of the student's writing, with emphasis on organization, development, and expression. To receive credit for either course, the student must earn a grade of *C* or better. If he fails to do so, no record of his attempt will be entered on his transcript. A statement of policy and procedure for exemption from part or all of the sequence is avilable from the English Department. *Does not count toward a major in* English. 4+4 q.h.

550H, 551H. *Honors Composition I-II.* An honors course for selected students, emphasizing wide reading and independent research, which attempts to improve the effectiveness of the student's writing. Emphasis is on organization, development, and expression. Students may be transferred from regular Composition sections to Honors sections with the recommendation of the instructor and the approval of the English Honors coordinator. To receive credit for either course, the student must earn a grade of *C* or better. If he fails to do so, no record of his attempt will be entered on his transcript. *Does* not count toward a major in English. 4+4 q.h.

600. *Introduction to Literary Study.* Introduction to the principles of literary study and to the skills used in reading literature and writing literary analysis; reading and discussion of literary theory. Materials drawn from several historical periods. Prereq.: English 551. 4 q.h.

610. *Introduction to World Literature.* Identical with Humanities 610. 4 q.h.

611. *Survey of English Literature I.* Major works of poetry and prose from the beginnings of English literature through the eighteenth century. Prereq.: English 551 or its equivalent. 4 q.h.

612. *Survey of English Literature II.* Major works of poetry and prose from the Romantic period to the present. Prereq.: English 551 or its equivalent. 4 q.h.

613. *Survey of American Literature I.* Major works of poetry and prose from the Colonial times through the Civil War. Prereq.: English 551 or its equivalent. 4 q.h.

614. *Survey of American Literature II.* Major works of poetry and prose from the Civil War to the present. Prereq.: English 551 or its equivalent. 4 q.h.

615. *Introduction to Literature: Fiction and Poetry.* A non-technical, non-historical course in which important short stories, novels, and poems are read and discussed critically for increased enjoyment and understanding. The emphasis is on American and British works. Designed for non-English majors to fulfill their humanities requirement. 4 q.h.

616. *Introduction to Literature: Film and Drama.* A non-technical, non-historical course in which important films and plays are examined and discussed critically for increased enjoyment and understanding. The emphasis is on American and British works. Designed for non-English majors to fulfill their humanities requirement. 4 q.h.

620. *Introduction to African Literature.* Identical with Humanities 620. 4 q.h.

625. *Selected Topics in Journalism.* Identical with Journalism 625. 3-5 q.h.

631. *Mythology in Literature.* Identical with Humanities 631. 3 q.h.

650. *The American Language.* A study of contemporary pronunciation, grammar, and usage, including a brief survey of the earlier development of the English language. *Not for English majors, who take English 755 and 757 or 758.* Prereq.: English 551 or its equivalent. 5 q.h.

699. *Selected Studies in Literature and Language.* An exploration of a specific topic or area in literature, literary theory, or language, not usually covered in other 600 level courses. The topic is announced each time the course is offered. May be repeated once *with change in topic.* Prereq.: English 551 or its equivalent. 4 q.h.

Upper Division Courses

Prerequisite to the following courses, unless otherwise stated: English 600 (except for the student who has already had an upper division literature course other than 708, 709 or 710); or consent of the department chairman.

708. *Children's Literature.* A study of the development of children's literature, giving the prospective elementary teacher some ways of judging books for children. Required of all elementary education candidates. *Does not satisfy the graduation requirement in humanities.* Prereq.: English 551 or its equivalent. 4 q.h.

709. *Adolescent Literature.* A study of the development of adolescent literature, giving the secondary teacher some ways of judging these books and some insight into the problems of making adolescent literature a meaningful experience for young people. *Does not satisfy the graduation requirement in humanities.* Prereq.: English 551 or its equivalent. 4 q.h.

710. *Juvenile Non-Fiction.* A study of nonfiction trade books appropriate for all levels of reading ability in the schools. An introduction to the full range of bibliographic aids available for the elementary and secondary teacher. Attention will be on the quality of various series, and criteria for evaluation. *Does not satisfy the graduation requirement in humanities; does not count toward a major in English.* Prereq.: English 709 or the consent of the instructor. 4 q.h.

715. *Journalism I.* Identical with Journalism 715. 4 q.h.

716. *Journalism II.* Identical with Journalism 716. 4 q.h.

717. *Journalism III.* Identical with Journalism 717. 4 q.h.

721L, 722L, 723L. *Journalism Workshop I, II, III.* Identical with Journalism 721L, 722L, 723L. 3-6, 3-6, 3-6 q.h.

740. *Expository Writing.* A course in advanced composition, designed to strengthen proficiency in writing expository prose, with emphasis on analysis of style, development of ideas, and clarity of thought and expression. Offered especially for those who plan to teach English. Prereq.: Any literature course in English or Humanities (except English 710); or junior or senior standing. 4 q.h.

746. *Creative Writing: Fiction.* Provides an opportunity for students to write original short stories and to have their efforts discussed by their classmates. May be repeated twice. Prereq.: English 551 or its equivalent. 3 q.h.

747. *Creative Writing: Poetry.* Provides the student with an opportunity to study the metrics, structure, and language of poetry and to apply these techniques to the writing of original poems. May be repeated twice. Prereq.: English 551 or its equivalent. 3 q.h.

750. *Language and Culture.* Identical with Linguistics 750 and Sociology/Anthropology 750. 4 q.h.

755. *Principles of Linguistic Study.* Survey of elements of linguistic structure, methods of analysis and description, theoretical models, and the role of language in human affairs. Prereq.: English 551 or its equivalent. 4 q.h.

757. *Development of the English Language.* Sounds, vocabulary, grammar and usage — from Old to contemporary English. Prereq.: English 755. 4 q.h.

758. *English Grammar.* Descriptions and analyses of English language structure. Prereq.: English 755. 4 q.h.

759. *Topics in English Linguistics.* Such alternative topics — to be announced when offered — as dialiects, stylistics, semantics, graphemics. May be repeated for different topics. Prereq.: English 755. Listed also as Linguistics 759. 4 q.h.

760. *Shakespeare I.* The plays of the first half of Shakespeare's career — e.g., *The Merchant of Venice, Richard III, Julius Caesar, and Hamlet. Prereq.: English 600.* 4 q.h.

761. *Shakespeare II.* The plays of the second half of Shakespeare's career — e.g., *All's Well That Ends Well, Othello, Macbeth, King Lear. Prereq.: English 600.* 4 q.h.

771. *American Romantics.* Emphasis on the period before the Civil War. Representative writers such as Edward Taylor, Cooper, Poe, Emerson, Thoreau, Whitman, Hawthorne, and Melville. Prereq.: English 600. 4 q.h.

772. *American Realists.* Emphasis on the period between the Civil War and World War I. Representative writers such as Franklin, DeForest, Twain, Howells, James, Crane, and Dreiser. Prereq.: English 600. 4 q.h.

776. *Modern American Fiction.* Important U.S. novelists and short story writers since 1920 (e.g., Faulkner, Hemingway, Fitzgerald). Prereq.: English 600. 4 q.h.

777, 778. *The English Novel I, II.* The history and development of the novel in England. English 777: the beginnings of the novel through Jane Austen; English 778: Sir Walter Scott through Thomas Hardy. 4+4 q.h.

783. *Milton.* A study of *Paradise Lost, Paradise Regained, Samson Agonistes,* minor poems and selected prose. Prereq.: English 600. 4 q.h.

815. *American Periodicals.* Identical with Journalism 815. 4 q.h.

830. *The Western Tradition: Ancient Drama.* Identical with Humanities 830. 4 q.h.

831. *The Western Tradition: Ancient Poetry and Prose.* Identical with Humanities 831. 4 q.h.

832. *The Western Tradition: Medieval and Renaissance.* Identical with Humanities 832. 4 q.h.

834. *The Western Tradition: Eighteenth and Nineteenth Centuries.* Identical with Humanities 834. 4 q.h.

860. *Chaucer.* Reading of Chaucer's principal works, with some study of his immediate predecessors and contemporaries. 4 q.h.

864. *Modern Drama.* Identical with Humanities 864. 4 q.h.

866. *Modern American and British Drama.* Important 20th century playwrights of the United States and the United Kingdom (e.g., O'Neill, Shaw, O'Casey, Beckett). Prereq.: English 600. 4 q.h.

868. *Modern American and British Poetry.* An intensive study of poetry in English published since 1890. 4 q.h.

871. *The Black Man in American Literature.* Literature by and about the Black Man in America. 4 q.h.

876. *The Modern Novel.* Identical with Humanities 876. 4 q.h.

880. *Medieval Epics and Romances.* Identical with Humanities 880. 4 q.h.

885. *Sixteenth and Seventeenth Century Poetry and Prose.* The English Renaissance to 1660, excluding Milton, with emphasis on Spencer, Jonson and Donne. Prereq.: English 600. 4 q.h.

887. *The Romantic period.* Important works in prose and poetry from 1789 to 1832 with emphasis on the poetry of Blake, Wordsworth, Coleridge, Shelley, Keats and Byron. 4 q.h.

888. *Restoration and Eighteenth Century.* Important works in poetry and prose, including the drama but not the novel, from 1660 to the beginning of the Romantic period, with emphasis on Dryden, Congreve, Swift, Johnson, and Burns. Prereq.: English 600. 4 q.h.

891. *The Victorian Period.* Important works in poetry and prose, excluding the novel, from 1832 to 1900, with emphasis on Carlyle, Ruskin, Tennyson, Browning, Arnold and Newman. 4 q.h.

895. *Modern British Fiction.* A study of the important writers of fiction from 1900 through WW II: the literary and social trends (e.q. Conrad, Lawrence, Joyce, Woolf, Waugh). Prereq.: English 600. 4 q.h.

899. *Selected Topics in Literary Study.* A study in depth of a specific topic in English or American literature or in literary theory. The topic is announced each time the course is offered. May be repeated once. Prereq.: English major with junior or senior standing or consent of the department chairman. 3-5 q.h.

FOREIGN LANGUAGES AND LITERATURES

Associate Professors Aliberti, Linkhorn, Loud (acting chairman) Loud, Metzger and Viehmeyer; Assistant Professors Barna, Veccia.

See *French, German, Greek, Italian, Latin, Russian,* and *Spanish.* For literature in translation, see *Humanities.*

FRENCH

A major in French consists of 45 quarter hours above the elementary level.

Courses in French literature (615, 705, 706, 820, 830, 835, 845, 873, and 885 if the topic deals with literature) satisfy the humanities requirement.

Lower Division Courses

See pages 36 and 107 for pre-college and college language requirements. Any two 601-level two quarter hour courses (601A, 601B, 601C, 601D, or 601Y) may be taken instead of the 4 q.h. 601; any two 602-level two quarter hour courses (602A, 602B, 602C, 602D, or 602Y) may be taken instead of the 4 q.h. 602.

501, 502, 503. *Elementary French I, II, III.* Fundamental principles of grammar taught through oral and written exercises and the reading of simple prose. The stress in this course is on the aural-oral facility. The prerequisite for French 502 is French 501 or equivalent; the prerequisite for French 503 is French 502 or equivalent. 4+4+4 q.h.

601. *Intermediate French I.* Grammar reviewed through oral and written exercises. Reading of modern prose and poetry. Prereq.: French 503 or equivalent. 4 q.h.

601A. *Beginning Conversation.* Oral French aimed at developing good pronunciation and useful, practical vocabulary. Prereq.: French 503 or equivalent. 2 q.h.

601B. *Structural French.* Oral and written exercises designed to reinforce the mastery of basic language structures. Prereq.: French 503 or equivalent. 2 q.h.

601C. *Literary Readings I.* Representative works and/or excerpts by contemporary au-

thors read for their artistic and ideological value. Prereq.: French 503 or equivalent. 2 q.h.

601D. *Elements of Writing.* Use of basic French in practical situations. Prereq.: French 503 or equivalent. 2 q.h.

601Y. *Intermediate Special Topics I.* Material in French at the 601 level in some specialized area not covered in the other two q.h. courses. May be taken three times for credit if content is not repeated. Prereq.: French 503 or equivalent. 2 q.h.

602. *Intermediate French II.* Continuation of French 601. Prereq.: French 601 or any two different French 601 two q.h. courses, or equivalent. 4 q.h.

602A. *Practical French.* Development of oral and written ability specifically designed to be applied in such areas as business, travel, etc. Prereq.: French 601 or any two different French 601 two q.h. courses, or equivalent. 2 q.h.

602B. *French Culture.* Selected readings and discussions to introduce the student to the culture of France and French-speaking countries. Prereq.: French 601 or any two different French 601 two q.h. courses, or equivalent. 2 q.h.

602C. *Literary Readings II.* Recent representative works and/or excerpts by French and French-speaking authors. A continuation of French 601C. Prereq.: French 601 or French 601C plus one other French 601 two q.h. courses, or equivalent. 2 q.h.

602D. *Non-Fictional Readings.* Selected readings in the social, biological or physical sciences, or in other areas, as suited to the interests of the class. Prereq.: French 601 or any two different French 601 two q.h. courses, or equivalent. 2 q.h.

602Y. *Intermediate Special Topics II.* Material in French at the 602 level in some specialized area not covered in the other two q.h. courses. May be taken three times for credit if content is not repeated. Prereq.: French 601 or any two different French 601 two q.h. courses, or equivalent. 2 q.h.

605-606. *Intermediate Dual Language Readings.* These courses are designed for the student whose work in high school French was average or better, but who does not feel able to undertake the regular 601 courses. The objective is to revive skill in reading French by starting with the study of bilingual materials and gradually proceeding to the reading of texts entirely in French. The prerequisite for 605 is two years of high school French; no University credit will be given if the student has taken more than two years of high school French or any elementary French courses in college. The prerequisite for 606 is 605. Admission by permit only. 4+4 q.h.

615. *Intermediate French Readings.* Intensive reading of modern authors, intended primarily to prepare students for the survey courses. Prereq.: French 602 or equivalent. 4 q.h.

640. *Selected Topics.* Development of language skills through the study of a topic with practical applications to some area such as business, social studies, cultural trends, etc. May be taken three times for credit if the topic is different. Total credit in French 640 may not exceed 8 q.h. A maximum of 4 q.h. may be applied to the major. Prereq.: French 602, or equivalent, or permission of instructor. 2-4 q.h.

655. *Conversational French.* Facility in oral expression through exercises on, and discussion of, assigned topics, and through prepared and extemporaneous situational dialogs. Prereq.: French 602 or equivalent. 4 q.h.

675. *French Composition.* Skill in writing developed through directed composition, starting at the intermediate level. Prereq.: French 602 or equivalent. 4 q.h.

Upper Division Courses

705. *Survey of French Literature I.* Middle Ages to 1800. Prereq.: French 615 or permission of instructor. 4 q.h.

706. *Survey of French Literature II.* 1800 to the present. Prereq.: French 615 or permission of the instructor. 4 q.h.

756. *Practice in French Conversation.* A course designed to maintain oral facility, and based on discussion of contemporary topics. May be taken either before or after 757. Prereq.: French 655 or permission of the instructor. 2 q.h.

757. *Practice in French Conversation.* A course on the same level as 756, but using different materials. May be taken either before or after 756. Prereq.: French 655 or permission of the instructor. 2 q.h.

771, 772. *Advanced French Grammar I, II.* A review in depth of French grammar through analysis of the stylistic devices of literary works, and through exercises, translation, and original composition. The prerequisite for

French 771 is French 675 or consent of the instructor; the prerequisite for French 772 is French 771. 4+4 q.h.

820. *18th Century French Literature.* The Age of Enlightenment: philosophical and literary works, primarily those of Montesquieu, Voltaire, Diderot, Rousseau, Beaumarchais, and Marivaux. Prereq.: French 705 or consent of the instructor. 4 q.h.

830. *19th Century French Novel.* Works of Balzac, Stendhal, Merimee, Daudet, Zola, Maupassant, and others. Prereq.: French 706 or consent of the instructor. 4 q.h.

835. *19th and 20th Century French Theater.* Romanticism, Naturalism, Symbolism in the theater; Sartre, Camus; Theater of the Absurd, and others. Prereq.: French 706 or the consent of the instructor. 4 q.h.

845. *Twentieth Century French Novel.* Proust, Gide, Camus, the Anti-Roman, and others. Prereq.: French 706 or consent of the instructor. 4 q.h.

869. *Applied French Phonetics.* A systematic study of French phonetics (sound system, intonation patterns, linking, mute e, etc.) to: provide remedial work on individual pronunciation problems, provide the prospective teacher with the techniques for teaching pronunciation and analyzing pronunciation problems in others, and provide a sophisticated approach to language study and language teaching by introducing students to basic linguistic concepts. Prereq.: French 772 or sophomore standing. 4 q.h.

873. *Explication de Texte.* Detailed examination of prose and poetry to develop skills in preceptive analysis of literature. Prereq.: French 772 or consent of the instructor. 4 q.h.

874. *Advanced French Composition.* A course designed to develop skills in free composition on assigned topics. Prereq.: French 772 or consent of the instructor. 4 q.h.

885. *Special Topics.* Studies in French language, literature or civilization ranging from medieval to modern times. Topic is announced each time course is offered. May be taken three times for credit, if content is not repeated. Prereq.: French 705 and/or 706, depending on the topic, or consent of the instructor. 2-4 q.h.

GEOGRAPHY

Professor Klasovsky; Associate Professors Laitman and Manton; Assistant Professors Anton and Stephens (chairman).

Students majoring in geography earn the Bachelor of Arts degree. In addition to the usual University requirements, a student majoring in geography must complete a minimum of 48 hours in geography. Required courses are: Geography 502, 503, 519, 627, 731, 810 and 813. At least 30 quarter hours must be earned in upper division courses.

The department offers specialized areas of study that provide information and skills needed by students planning to enter the fields of cartography, climatology, city and regional planning, elementary and secondary education, earth sciences, environmental studies, meteorology and regional studies. Suggested curricula for the above fields are available from the department office.

SUGGESTED ELECTIVES:

Physical Geography

The University's science/mathematics requirements are satisfied by the following geography courses: 503, 603, 625, 730. For geography majors, the Geography Department will accept Geology 701 and 703 for credit as courses in physical geography.

Lower Division Courses

503. *Introduction to Physical Geography.* An introduction to the basic concepts of geographic systems analysis and a non-laboratory presentation of the physical elements of the environment—climate, landforms, soils, vegetation, and animal life. Stress is placed upon the development of an awareness and appreciation of the areal distributional patterns of these physical elements. 4 q.h.

603. *Conservation of Natural Resources.* Conservation of soil, water, plant, animal, mineral, and recreational resources; general principles of conservation as they apply to the U.S.A. 4 q.h.

625. *General Meteorology.* An introductory course dealing with cloud types, pressure, temperature, humidity, precipitations, atmospheric composition and circulation, types of stability, air mass analysis, and surface map analysis. 4 q.h.

Upper Division Course

730. *Regional Climatology.* The general principles of climatology. The nature and elements of climate; factors governing climatic types and their distribution; influences on soils, landforms, plants, and man; simplified classification of climates; detailed treatment of the major continents. Students who have

received credit for Geography 604 may not receive credit for Geography 730. Prereq: Geography 503 or 625 or equivalent. 4 q.h.

HUMAN AND REGIONAL GEOGRAPHY

The University's social science requirements are satisfied by the following courses.

Lower Division Courses

502. *Introduction to Geography.* An introductory study of casual relationships existing between life activities and the setting, structure and significance of the natural elements of the environment. 4 q.h.

519. *Introduction to Economic Geography.* Geographical study of the world distribution of economic activity, including an introduction to location theory. 4 q.h.

626. *World Geography.* A comparative study of representative regions of the world; an examination of the cultural, social, economic, and political developments in relation to the geographical conditions. Students who have received credit for Geography 600 may not receive credit for 626. 4 q.h.

627. *Geography of the United States.* A basic geographic understanding is provided for the various physical, human, and economic patterns characteristic of the United States. Focus is placed upon the personality and problems of various regions of the country. Students who have received credit for Geography 718 may not receive credit for 627. 4 q.h.

Upper Division Courses

Note: Geography 502 or 519 or the consent of the Chairman of the Geography Department is a prerequisite for any of the following 700-level courses.

712. *Regional Geography of Black Africa.* Resources, political affiliations, and stages of economic development of Africa, south of the Sahara Desert. 3 q.h.

713. *Regional Geography of North Africa, and the Middle East.* Resources, political affiliations and stages of economic development of North Africa and Middle Eastern political units. 3 q.h.

714. *Regional Geography of Eastern Asia.* A regional approach to the economic and cultural background of the countries of Eastern Asia, with emphasis on China, Japan, and Korea. 3 q.h.

716. *Geography of Western Europe.* Geographic factors in the economic, social, and political progress of the nations of Western Europe. Major problems of the countries of Western Europe in light of their geographical backgrounds. 4 q.h.

717. *Geography of Eastern Europe.* Geographic factors in the economic, social, political progress of the nations of Eastern Europe. Major problems of the countries of Eastern Europe in light of their geographic backgrounds. 4 q.h.

719. *Geography of the Soviet Union.* The major regional divisions of the Soviet Union. The resource base in relation to the economic and political aims of the Soviet state. 4 q.h.

720. *Regional Geography of Latin America.* A study of the application and operation of geographic principles in the regional analysis and evaluation of the cultural, economic, and physical backgrounds of the countries of Central and South America. Students who have received credit for Geography 710 or 711 may not receive credit for 720. 4 q.h.

721. *Geography of Ohio.* An analysis and inventory of the state's physical attributes; an interpretation and appreciation of the spatial manifestations of man's organization and utilization of Ohio's environment. Emphasis is placed upon resource management, economic development, and continuing urbanization. 3 q.h.

722. *Historical Geography of the United States.* A study of the settlement and sequence occupance of the United States, with emphasis on the physical, climatic, economic, and cultural influences. Students who have received credit for Geography 802 may not receive credit for 722. 3 q.h.

723. *Political Geography.* Geographical characteristics of nation states. Geographic factors in the evolution, structure, and function of states. Relation of geopolitics to political geography. Students who have received credit for Geography 804 may not receive credit for 723. 3 q.h.

724. *Regional Geography of South Asia.* A regional approach to the cultural, economic, and physical backgrounds of the political units of South Asia; emphasis is placed upon Bangladesh, Burma, India, Pakistan, and Thailand. Students who have received credit for Geography 715 may not receive credit for 724. 3 q.h.

725. *Geography of Human Settlements.* A geographical study of the distribution, structure, and function of urban and rural settlements. Emphasis will be on the morphological

structure and growth of settlements. Students who have received credit for Geography 806 may not receive credit for 725. 4 q.h.

726. *Urban Geography.* A geographical study of the change in and the growth of urbanized regions. Emphasis will be upon the factors contributing to changing spatial relationships within urbanized regions as a consequence of changing technology. Students who have received credit for Geography 807 may not receive credit for 726. 4 q.h.

729. *Evaluation of Community Health Services.* Cross-listed and identical with Sociology/Anthropology 729. An interdisciplinary clinical course taught jointly by the departments of Economics, Geography, Political Science and Sociology Anthropology and Social Work. Prereq.: Junior standing or admission to NOUCOM-YSU program. 8 q.h.

731. *Introduction to Cartography.* Techniques and practical training in the compilation, design and drafting of maps, including computer mapping techniques. Prereq.: eight hours of Geography and junior standing.

4 q.h.

800. *European Area Study.* A course in the geography and in the history of Western Europe, with special emphasis on urban and cultural development. The class is made up of about 30 members supervised by the Geography and History faculty, and tours cities in Austria, Belgium, France, Germany, Italy, The Netherlands, Switzerland, and the United Kingdom. The course is designed to provide maximum opportunities for meeting the people of Europe to develop an understanding of its various regions and urban areas, and to permit more valid interpretations of its current political, economic, and cultural state. The course grade is based upon a term paper which must be submitted within 60 days after the end of the course. 9 q.h.

Note: Junior or senior standing in one of the social sciences or the consent of the Geography Department chairman is a prerequisite for any of the following courses.

805. *Geography of Environmental Planning.* A review of the totality of factors influencing changes in our physical and cultural environment. Particular stress will be placed on the causes and effects of air, water, and land pollution as part of a region or country-wide system. Problems will be identified and proposed solutions reviewed. Specific investigation will be made of regions as well as the interrelationship between regions themselves. These factors will be examined in context of the spatial distribution of economic and social activities. 3 q.h.

808. *Land Use and Transportation.* A geographical study of the characteristics and patterns of land use, and the interrelationships between land-use and transportation patterns. 4 q.h.

809. *Geographical Aspects of City and Regional Planning.* A study of geographical elements of city and regional planning with emphasis upon use of maps and geographical methods and techniques in planning.

4 q.h.

810, 811, 812. *Special Problems in Geography I, II, III.* A study in depth of specific problems in one of the branches of geography. The problem will be dependent upon the student's interest, competence, and the availability of departmental equipment.

1-4 q.h. each (limit 8 q.h.)

813. *Field Methods.* Practical experiences in geographic data collection. Emphasis is on applying the techniques of observation, sampling, interviewing and mapping to both physical and human phenomena having geographical dimensions. Students will apply these techniques at several scales: the local campus, the Youngstown-Warren SMSA, a larger metropolitan region, and other nearby regions. Participation in field trips is mandatory. Prereq.: Senior standing, eight hours of Geography, and consent of the Chairman and instructor. 4 q.h.

GEOLOGY

Associate Professors Abram, A. Harris, E. Harris, Khawaja (chairman), and Singler.

Geology may be the major for the degree Bachelor of Science or Bachelor of Arts.

The major in geology provides the student with a background for professional work in geology, for teaching geology, for graduate work in geology, and for work in related fields.

For the Bachelor of Science degree the student majoring in geology must complete, in addition to the general University requirements, a miminum of 65 quarter hours of courses in geology of which 61 quarter hours are specified and four quarter hours are elective. The specified courses are: Geology *505, *506, *604, *607, 701, *704, 705, 706, 801, 802, 803 and a course in field geology. The latter must carry a minimum of four quarter hours of transferable credit (see University

limitations on transfer of credits under Candidacy for a Degree: residence). Electives may be chosen from the following: Geology 602, 702, 703, 707, 804, 806, and 811. The minor must be either astronomy, biology, chemistry, civil engineering, computer science (math.), mathematics, or physics unless the student's future plans justify a different minor.

The field camp and the specific courses for the minor are chosen in consultation with the advisor and the department curriculum committee.

Required courses outside the department are: Astronomy 608; Chemistry 515, 516, 517; Mathematics 571, 572; Physics 501, 502, 503, 502L, 503L or 510, 610, and 611.

For the Bachelor of Arts degree the student majoring in geology must complete, in addition to the general University requirements, a minimum of 65 quarter hours of courses in geology of which 50 quarter hours are specified and 15 quarter hours are elective. The specified courses are: Geology *505, *506, *604, *607, 701, *704, 705, 706, 801, and a course in field geology. The latter must carry a minimum of four quarter hours of transferable credit (see University limitations on transfer of credit under Candidacy for a Degree: residence). Electives may be chosen from the following: Geology 602, 702, 703, 707, 802, 803, 804, 806, and 811. The student may choose any minor desired. Required courses outside the department are: Astronomy 608; Chemistry, 515, 516, 517; Mathematics 550; Physics 501, 502, 503, 502L and 503L.

The field camp and the specific courses for the minor are chosen in consultation with the advisor and the department curriculum committee.

A comprehensive examination will be made available two quarters before graduation to those who wish to take such an examination prior to graduation.

Lower Division Courses

505. *Physical Geology.* A study of the various physical and chemical processes acting on and within the earth and their products. Credit for this course may be applied towards the University science requirements. Four hours of lecture per week. 4 q.h.

506. *Historical Geology.* A chronological study of the physical and biological development of the earth as determined by the rock and fossil record. Credit for this course may be applied towards the University science requirements. Four hours of lecture per week. Prereq.: Geology 505. 4 q.h.

508. *Geology of Gem Stones and Allied Materials.* Formation, occurrence and distribution of gem materials. Properties and identification of gem stones, factors affecting their value. Introduction to synthetic-artificial gem materials. Not applicable toward a geology major. 4 q.h.

510. *Geology of National Parks.* Geologic history of national parks, geologic processes that can be observed. Treatment will include eastern and western North American parks and Hawaii. Simulated field trips to several of the major parks are also planned. 4 q.h.

602. *Introduction to Oceanography.* Survey in geological, physical, chemical and biological oceanography; description and distribution of properties and their relationship to circulation, shorelines, ocean features, sediments, organisms and environments. 4 q.h.

604. *Megascopic Petrography.* A study of igneous, sedimentary, and metamorphic rocks based on their megascopic characteristics. Attention is given to classification, modes of occurrence, and constituent minerals. Five hours of lecture and four hours of laboratory work per week. Prereq.: C or better in Geology 607. 6 q.h.

607. *Geology Laboratory.* A combined lecture and laboratory involving the identification of minerals, rocks, and fossils, and the use of topographic and geologic maps plus outside work on geologic techniques. A student who has received credit for Geology 507 may not receive credit for Geology 607. Four hours of laboratory and two hours of lecture per week. Prereq.: Geology 506, or may be taken concurrently. 4 q.h.

611. *Geology for Engineers.* Study of geologic principles, processes, and materials; focus on recognition of geologic factors as they apply to engineering operations and projects. Laboratory includes examination of minerals, rocks, maps and case histories. Three hours of lecture and three hours of laboratory per week. 4 q.h.

Upper Division Courses

701. *Geomorphology.* A detailed study of the various landforms and their origins. The laboratory session consists of the utilization of aerial photographs and topographic maps in recognizing and interpreting landforms.

*These courses must be completed prior to attending the course in field geology.

Five hours of lecture and four hours of laboratory work per week. Prereq.: Geology 607. 6 q.h.

702. *Glacial Geology.* A study of the glacial succession in North America during the Pleistocene Epoch. Emphasis is on the origin, movement, transportation by and deposits of glaciers. Field trips are mandatory. Five hours of lecture per week. Prereq.: Geology 505. 5 q.h.

703. *Physiography of the United States.* A study of the physiographic regions of the United States. Maps, diagrams, and aerial photographs are used in laboratory work. Five hours of lecture and four hours of laboratory work per week. Prereq.: Geology 607. 6 q.h.

704. *Structural Geology.* A descriptive study of rock structures, their geometry and significance; mechanical properties of rocks; the nature and origin of faults, folds, and deformation in the earth's crust; stress-strain relationships. Laboratory work includes solution of 3-dimensional problems in geology, methods of structural analysis, and field techniques. Four hours of lecture and two hours of laboratory per week. Prereq.: Geology 607. 5 q.h.

705. *Principles of Paleontology.* A study of fossil invertebrates, including their origin, classification, and significance. All phyla are studied in their relative biologic order. Five hours of lecture and four hours of laboratory work per week. Prereq.: Geology 607 or consent of instructor. 6 q.h.

706. *Geology of Economic Mineral Deposits.* A study of the occurrence, origin, and distribution of metallic and nonmetallic mineral deposits; with special attention to the economic utilization of earth materials. Field trips are mandatory. Five hours of lecture per week. A student who has received credit for Geology 601 may not receive credit for Geology 706. Prereq.: Geology 607. 5 q.h.

707. *Applied Geophysics.* Applications of geophysics to geological problems. Emphasis is on the geophysical exploration for mineral and fuel resources. The study will include fundamentals of terrestrial electricity, seismology, geomagnetism, terrestrial heat, terrestrial gravity in addition to the structure and composition of the earth as determined by geophysical methods. Prereq.: Geology 505, Physics 503; Mathematics 571 recommended. 4 q.h.

801. *Mineralogy.* A study of the elements of crystallography, physical and chemical properties, occurrence and use of the more common minerals. Qualitative analysis of minerals using the blow-pipe, borax bead tests, and flame tests are utilized. Five hours of lecture and four hours of laboratory work per week. Prereq.: Geology 607, Chemistry 515. 6 q.h.

802. *Stratigraphy and Sedimentation.* A study of the formation of stratified rocks and their physical characteristics, principles of correlation, and the interrelationships of structure, paleontology, sedimentation and stratigraphy in sedimentary environments. Laboratory work includes methods and techniques of analysis. Four hours of lecture and two hours of laboratory per week. Prereq.: Geology 607. 5 q.h.

803. *Optical Mineralogy.* The theory and use of the polarizing microscope and its application to the study of crystalline materials. Five hours of lecture and four hours of laboratory work per week. Prereq.: Geology 801. 6 q.h.

804. *Ground Water.* A study of the geologic and hydrologic factors controlling the occurrence and behavior of water beneath the earth's surface. Five hours of lecture per week. Prereq.: Geology 607. 5 q.h.

805. *Special Problems in Geology.* A study in depth of specific problems in one of the branches of geology. The problem will depend upon the student's interest, qualifications, and equipment available. A maximum of 10 quarter hours may be taken. Prereq.: Consent of the Geology Department chairman and the instructor. 1 to 5 q.h.

806. *Introduction to X-Ray Diffraction.* An introduction to the theory of x-ray diffraction and spectroscopy with respect to crystalline substances and the use and application of the Debye-Scherrer powder camera, the back reflection single crystal Laue camera, x-ray diffraction, x-ray spectroscopy (fluorescence) in the determination of the crystalline structure, composition and identification of minerals, inorganic and organic materials. Two hours of lecture and three hours of laboratory work per week. Prereq.: Geology 801 or consent of the Geology Department chairman. 3 q.h.

807, 808, 809. *Earth Science I, II, III.* An integrated course in earth science designed for teachers of earth science and general science courses. A study of the earth and its environment in space, the various physical and chemical processes acting on and within

the earth throughout geological time, lunar geology and the solar system. Prereq.: Certification for teaching or permission of the chairman of the Department of Geology. 3+3+3 q.h.

811. *Environmental Geology.* Study of earth processes, earth resources and properties of earth materials insofar as they relate to human activities and man as a geological agent. Geological consequences of industrialization. Geological factors in environmental management. Prereq.: Geology 706 and senior standing or permission of the department chairman. 4 q.h.

GERMAN

A major in German consists of 45 quarter hours above the elementary level.

Courses in German literature (615, 707, 708, 709, 815, 816, 825, 835, 845, and 885 if the topic deals with literature) satisfy the humanities requirement.

Lower Division Courses

See pages 36 and 107 for pre-college and college language requirements. Any two 601-level two quarter hour courses (601A, 601B, 601C, 601D, or 601Y) may be taken instead of the 4 q.h. 601: any two 602-level two quarter hour courses (602A, 602B, 602C, 602D, or 602Y) may be taken instead of the 4 q.h. 602.

501, 502, 503. *Elementary German I, II, III.* Fundamental principles of grammar taught through oral and written exercises and the reading of simple prose. The stress in this course is on the aural-oral facility. The prerequisite for German 502 is German 501 or equivalent; the prerequisite for German 503 is German 502 or equivalent. 4+4+4 q.h.

505. *German Reading for Translation I.* Introduction to German grammar and vocabulary to facilitate skill in reading for translation. This course is not applicable to the language requirement for the A.B. degree; it is applicable to the language requirement for the B.S. degree. German 505 is not applicable as a prerequisite for German 601. 4 q.h.

506. *German Reading for Translation II.* Practice in reading scientific German in the fields of biology, chemistry, geology, mathematics, medicine, physics, and general science. Readings will vary to coincide with interests of class. This course is not applicable to the language requirement for the A.B. degree; it applies to the language requirement for the B.S. degree. German 506 is not applicable as a prerequisite for German 601. Prereq.: German 505 or equivalent. 4 q.h.

601. *Intermediate German I.* Selected grammatical principles reviewed. Introduction to literary and cultural readings; continued practice in speaking and writing. Prereq.: German 503 or equivalent. 4 q.h.

601A. *German for Travelers.* Practice in German conversation for improving pronunciation and expanding vocabulary. Vocabulary and phrases for traveling in German-speaking countries are stressed. Prereq.: German 503 or equivalent. 2 q.h.

601B. *German Grammar in Review.* Review of basic principles of the structure of the language. Intended for those students whose command of grammar is weak. Prereq.: German 503 or equivalent. 2 q.h.

601C. *German Readings.* Practice in reading German for pleasure. Reading materials will vary and include cultural, literary, and topical items. Prereq.: German 503 or equivalent. 2 q.h.

601D. *Personal Writing in German.* Practice in the basic elements of writing German, especially letters. Prereq.: German 503 or equivalent. 2 q.h.

601Y. *Intermediate Special Topics I.* Material in German at the 601-level in some specialized area not covered in the other two q.h. courses. May be taken three times for credit if content is not repeated. Prereq.: German 503 or equivalent. 2 q.h.

602. *Intermediate German II.* Continuation of literary and cultural readings with oral and written interpretations. Prereq.: German 601 or equivalent. 4 q.h.

602A. *Practical German.* Development of oral and written ability specifically designed to be applied in such areas as business. Prereq.: German 601 or any two different German 601 two q.h. courses, or equivalent. 2 q.h.

602B. *German Culture.* Selected readings and discussions to introduce the student to the cultural heritage of German-speaking countries. Prereq.: German 601 or any two different German 601 two q.h. courses, or equivalent. 2 q.h.

602C. *German Literary Readings.* Readings in recent German literature. Prereq.: German 601 or German 601C plus any other German 601 two q.h. course. 2 q.h.

602D. *Non-fictional Readings.* Readings in the social, biological, or physical sciences, or

other areas as suited to the interests of the class. Prereq.: German 601 or German 601C plus any other German 601 two q.h. course. 2 q.h.

602Y. *Intermediate Special Topics II.* Material in German at the 602-level in some specialized area not covered in the other two q.h. courses. May be taken three times for credit if content is not repeated. Prereq.: German 601 or any two different German 601 two q.h. courses, or equivalent. 2 q.h.

615. *Intermediate German Readings.* This course is designed to improve reading ability in German. The reading material is selected from a wide range of interest areas. Prereq.: German 602 or equivalent. 4 q.h.

618. *Intermediate German Conversation.* Designed to increase oral facility in German through exercises on, and discussion of, assigned topics. Prereq.: German 602 or equivalent. 4 q.h.

620. *Intermediate German Composition.* Skill in writing German developed through directed composition. Prereq.: German 602 or equivalent. 4 q.h.

640. *Selected Topics.* Development of language skills through the study of a topic with practical applications to some area such as business, social studies, cultural trends, et. May be taken three times for credit if the topic is different. Total credit in German 640 may not exceed 8 q.h. A maximum of 4 q.h. may be applied to the major. Prereq.: German 602 or equivalent or permission of instructor. 2-4 q.h.

Upper Division Courses

707, 708, 709. *German Cultural Heritage I, II, III.* A survey of German civilization from the beginnings to the present, including such topics as literature, history, music, and art. German 707: The Beginnings to the Reformation; German 708: The 17th, 18th, and 19th Centuries; German 709: The 20th Century. Prereq.: German 615 or permission of the instructor. 4+4+4 q.h.

766, 767. *Advanced German Conversation I, II.* Continued practice in oral expression through exercises and discussions of assigned topics and through prepared and extemporaneous situational dialogues. Need not be taken in sequence. Prereq.: German 618, or German 615 and permission of instructor. 2+2 q.h.

790. *Advanced German Translation.* Practice in translating from German to English and English to German through a variety of selected belletristic and non-belletristic writings. Students who have received credit for German 850 may not receive credit for German 790. Prereq.: German 615 or 620. 4 q.h.

815. *Enlightenment Through Storm and Stress.* A study of the literary, critical, and philosophical works which laid the foundation for German Classicism and Romanticism. Includes works of Lessing, Gottsched, and Klopstock. Prereq.: German 708 or permission of instructor. 4 q.h.

816. *Goethe and Schiller.* A study of the lives and works of Goethe and Schiller with stress on their classical writings. Prereq.: German 708 or permission of instructor. 4 q.h.

825. *German Romanticism.* Intensive study of early and late German Romanticism including the reading of belletristic and theoretical writings. Prereq.: German 708 or permission of instructor. 4 q.h.

835. *German Realism and Naturalism.* Intensive study of German literature from Poetic Realism through Naturalism. Prereq.: German 708 or permission of instructor. 4 q.h.

845. *Recent German Literature.* Study of major authors since Naturalism, including Mann, Hesse, Kafka, Rilke, Hoffmannsthal, George and others. Prereq.: German 709 or permission of instructor. 4 q.h.

855, 856. *Advanced German Grammar and Composition.* A systematic, in-depth review of German grammar through exercises and original composition. The prerequisite for German 855 is German 620 or permission of instructor; the prerequisite for German 856 is German 855 or permission of instructor. 4+4 q.h.

867, 868. *Comparative Germanic Linguistics.* An introduction to the common origin and subsequent developments of the principal Germanic languages. Prereq.: German 602 or Linguistics 755, or the equivalent of one of these. 3+3 q.h.

885. *Special Topics.* Studies in German language, literature, or civilization ranging from medieval to modern times. Topic is announced each time course is offered. May be taken for a maximum of 12 hours credit, if content is not repeated. Prereq.: 707 and/or 708 and/or 709 depending on the topic, or consent of the instructor. 2-4 q.h.

GREEK (ANCIENT)

A major in Greek is not offered, but credit in Greek may be counted toward a major in *Latin, Classical Studies,* or *Humanities.*

Courses in Greek literature (701, 702, and 703) satisfy the humanities requirement.

Lower Division Courses

See pages 36 and 107 for pre-college and college language requirements.

501, 502, 503. *Elementary Greek I, II, III.* Grammar, syntax, and simple composition; reading selections from various Greek writers and the New Testament. Introduction to Greek literature, history, and civilization; attention to the Greek element in the English language. The prerequisite for Greek 502 is Greek 501 or equivalent; the prerequisite for Greek 503 is Greek 502 or equivalent. 3+3+3 q.h.

601. *Intermediate Greek I.* Readings in one or more authors, preceded or accompanied by review of elementary Greek if needed. Prereq.: Greek 503 or equivalent, or consent of instructor. 3 q.h.

602. *Intermediate Greek II.* Readings from one or more authors. Prereq.: Greek 601 or equivalent, or consent of instructor. 3 q.h.

603. *Intermediate Greek III.* Readings from one or more authors. Prereq.: Greek 602 or equivalent, or consent of instructor. 3 q.h.

Upper Division Courses

These courses can be given on request. The prerequisite is Greek 603 or its equivalent, or consent of the instructor.

701. *Advanced Readings.* Readings in one or more major Greek writers, selected with consideration of the students' interests. 2-5 q.h.

702. *Advanced Readings.* Like Greek 701, either as a continuation of it or as an independent course. 2-5 q.h.

703. *Advanced Readings.* Like Greek 702, either continuing the material of 702 or independent of it. 2-5 q.h.

704. *Greek Composition.* Review of the principles of Greek syntax through their observance in writing Greek. Emphasis on differences between Greek and English in idiom, structure, and style in the underlying thought or point of view. 2-5 q.h.

HEALTH AND PHYSICAL EDUCATION

Professors Philipp and Ringer (chairman); Associate Professors Barret, Carson, Kocinski, Laborde, Liptak, Longmuir, Whitney, and Wright; Assistant Professors Connelly, Loehr, Ramsey and Thompson; Instructors DiEdwardo Neville, Wedekind, and Wikerson.

The Health and Physical Education Department seeks to make a contribution to the objectives of Youngstown State University by providing for the physical health and well-being of the student through increasing motor efficiency, developing appropriate values and attitudes, and providing opportunities for social adjustment.

Required Courses

Six hours of credit in Health and Physical Education are required for graduation. Three credit hours are in health class (HPE 590), and three credit hours are in physical activity classes, usually one credit hour each. However, the following three-hour courses will also fulfill the three hours in physical activities: HPE 630, 631, 632.

The form of activity is chosen by the student. Activity courses will be listed in the quarterly class bulletins.

Students who have a physical disability that will prevent them from engaging in activity class should register for HPE 614, a classroom course which meets the activity requirement. If a handicapped student is able to take some kind of activity class, the student is urged to see the nurse in the Health Office, Beeghly 200, and review with her activities which might be appropriate. If a student has any questions about personal doctor's recommendations and how these recommendations may relate to the activities courses at YSU, the nurse in the Health Office may be able to make suggestions. Handicapped students are encouraged to focus on their physical abilities and consider seriously the social and physical benefits that accrue from physical activities and games.

If a student finds only one appropriate activity class, the student may request permission from the Health and Physical Education Department (Beeghly 307) to take the same class three times for three credits.

Veterans who have served at least one full year can receive Health and Physical Education credit for service. This is detailed under the heading "Veterans" in the YSU catalog. The three hours in physical activity are

waived for R.O.T.C. students who have completed Military Science 501, 502, 503 and 601, 602, 603.

Members of the men's varsity baseball, basketball, football, golf, swimming, tennis, and rifle squads, and women's varsity sports (basketball, field hockey, gymnastics, softball, swimming, and volleyball) may receive physical activity credit through enrollment in 549 or 549N, Varsity Competition.

Locker and towel service is available upon payment of a fee (see fees on page 53). The fee is required for specific courses as indicated in the course descriptions. Students must provided their own clothing for activity classes and this attire must be appropriate to the activity. Most of the other equipment for physical education classes is available for use without charge. A student wishing to use their own racket, golf clubs, bow, etc. may do so but is advised to consult with the instructor before buying new equipment.

Physical Examinations

The Health and Physical Education Department requires all students enrolled in a physical education activity course to have on file in the University Health Center a completed medical examination form signed by a physician. The medical examination required for enrollment in the University is acceptable in meeting this requirement for a four-year period from the time of entrance into the University. Any student who is involved in a major accident, or has had a major illness during this four-year period of time must submit to the University Health Center another medical examination form completed after such accident or illness. Medical examination forms are available from the University Health Center. Students without the above-mentioned physical examination on file in the University Health Center will not be admitted to activity classes.

Each physical education major is required to have an annual medical examination, the results of which must be on file in the University Health Center. Majors who enter the University in the winter or spring quarter will have the initial medical examination on file and this will meet the department requirements until the following September, at which time they must have another physical examination. Students without the above-mentioned physical examination on file in the University Health Center will not be admitted to activity classes.

Professional Program

Youngstown State University is fully approved by the Ohio State Department of Education for the preparation of health education and physical education teachers for public schools. The degree of Bachelor of Science in Education with a major in health education or physical education leads to either an Ohio State High School, or Special, Provisional Certificate.

Students interested in majoring or minoring in health or physical education should consult with the Health and Physical Education Department chairman. The physical education minor requires approximately 38 quarter hours of specified course work. The health education minor requires approximately 34 quarter hours of specified course work.

Those students seeking teaching certificates in health and physical education must formally apply to the Health and Physical Education Department when they have completed 75 to 100 hours of credit. Application forms and other information for formal admittance to the Health and Physical Education Department may be obtained in the departmental office, Room 307, Beeghly Center.

HEALTH EDUCATION MAJOR CURRICULUM GUIDE
Students should average 48 quarter hours per year.

FIRST YEAR	Hrs.
English 550-551	4+4
Fine Arts elective	3
Humanities elective	4
Biology elective	4
Education 501	3
H&PE 590	3
H&PE 601	3
Activity elective	1+1+1
Chemistry 501 and/or Home Economics 551 and/or Biology 504 and/or Biology 721*	7-8
Math. elective	4
General electives	

SECOND YEAR	Hrs.
Philosophy elective	4
Speech 554	4
Biology 551, 552	4+4
Psychology 560	4
Psychology 709	4
Psychology 755 or 756	4

+Electives should be applied toward minor field.
*Biology 721 should be deferred until third year.

Social Science elective	6
Sciology 500	4
Science elective	4
H&PE 680	4
H&PE 690	3
H&PE 701	1

THIRD YEAR	Hrs.
Education 704, 706, 708	3+3+-4
H&PE 790	4
H&PE 791	4
H&PE 793	3
H&PE 794	4
H&PE 796	4
Psychology 707, 708 or Sociology 705	3 or 4

FOURTH YEAR	Hrs.
H&PE 801 (elective)	2
H&PE 892	3
H&PE 899	2
Education 710	4
Education 845	15
General electives	

PHYSICAL EDUCATION MAJOR CURRICULUM GUIDE
Students should average 48 quarter hours per year

FIRST YEAR	Hrs.
English 550-551	4+4
Biology 506, 507	4+4
Education 501	3
Fine Art elective	3
Speech 554	4
H&PE 590	3
H&PE 595	2
H&PE 601	3
Gymnastics activities	2
Team Sport activities	4
Individual & dual sports activities	2
H&PE 540	1
H&PE 545	1
H&PE Aquatics	1
Math. elective	4

SECOND YEAR	Hrs.
Philosophy elective	4
Humanities elective	3-5
Biology 551, 552	4 + 4
Psychology 560	4
Psychology 709	4
Psychology 755 or 756	4
Social Science elective	6
H&PE 700	1
H&PE 750	2
H&PE 540	1
H&PE 540	
H&PE 550	1
H&PE 551	1
Individual & dual sports activities	3

THIRD YEAR	Hrs.
Education 704, 706, 708	3 + 3-+4
H&PE 680	4
H&PE 761, 762	2+2
H&PE 765	4
H&PE 780	2
H&PE 791	4
H&PE 795	4
General electives+	

FOURTH YEAR	Hrs.
H&PE 895	3
H&PE 895	3
H&PE 896	4
H&PE 897	2
H&PE electives (two of the three following) H&PE 850, H&PE 855, H&PE 880	15
General electives+	

+Electives should be applied toward minor field.

COACHING MINOR

The coaching minor is avaialable for those students interested in coaching. (Not applicable for physical eduction majors.) State of Ohio Department of Education Certificate is not avaialable for coaching.

COACHING MINOR	Hrs.
H&PE 601	3
H&PE 750	2
H&PE 795*	4
H&PE 896	4
H&PE 897	2
Choice of four activity courses (in addition to YSU requirement)	4

*Will include Biol. 551 & 552 as prereq. of H&PE 795.

Choice of the following nine officiating courses to total four hours	
H&PE 650	1
H&PE 651	2
H&PE 653	2
H&PE 655	1
H&PE 656	1
H&PE 657	1
H&PE 658	2
H&PE 659	2
H&PE 660	1

Choice of the following six coaching courses to total four hours.

H&PE 751 2
H&PE 752 2
H&PE 753 2
H&PE 754 2
H&PE 755 2
H&PE 756 2

The following activity classes meet the University activity requirement and are scheduled two contact hours per week for one hour credit.

502.* *Volleyball.* Skills, techniques, rules, and strategy of volleyball. 1 q.h.

503.* *Basketball.* Development of fundamental skills and techniques in basketball. Offensive and defensive team play and strategy. 1 q.h.

510. *Archery.* Techniques of target archery. Selection, care, and repair of equipment. 1 q.h.

511.* *Badminton.* Skills, mechanics, and rules of badminton. 1 q.h.

512. *Bowling I.* Fundamentals of bowling the straight ball. Equipment selection, correction of errors, and scoring. Classes held at McGuffey Bowling Lanes. A fee is charged. Prereq.: Beginning bowler. 1 q.h.

513. *Bowling II.* Intermediate bowling. Refinement of bowling skills and use of the hook delivery. Tournament planning, team strategy, and competition. Classes held at McGuffey Bowling Lanes. A fee is charged. Prereq.: Bowling I or 100 average. 1 q.h.

514.* *Fencing I.* Fundamentals of foil fencing. Methods of attack and parry, and elements of bouting and judging. 1 q.h.

515.* *Fencing II.* Intermediate techniques and strategy of foil fencing and bouting Prereq.: Fencing I or consent of instructor. 1 q.h.

516.* *Gymnastics I.* Stunts and tumbling. Fundamentals and methods of stunts and tumbling with gymnastic conditioning. 1 q.h.

517.* *Gymnastics II.* Beginning apparatus. Fundamental techniques and methods of appropriate gymnastic apparatus and routine composition. Prereq.: Gymnastics I or consent of instructor. 1 q.h.

518.* *Gymnastics III.* Techniques of coaching, spotting and/or performing with emphasis on methods and advanced skills. Prereq.: Gymnastics II or consent of instructor or competition experience. 1 q.h.

519. *Racketball and Squash.* Racketball and squash rules and techniques for singles and doubles play in racketball and for singles play in squash. Strategy and skill development are emphasized. 1 q.h.

520. *Golf I.* Fundamental skills of golf. Includes grip, stance, swing patterns, and putting as well as rules of course play. 1 q.h.

521. *Golf II.* Intermediate golf. Refinement of swing patterns, methods of instruction, and correction of errors. Emphasis on use of various clubs and types of shots. Prereq.: Golf I or intermediate skill. 1 q.h.

524.* *Figure Control and Exercise Programs.* Individualized and group exercise programs designed to modify the figure and improve general fitness. 1 q.h.

525.* *Wrestling.* Basic techniques of wrestling. Offensive and defensive maneuvers, methods, rules, and officiating. 1 q.h.

526. *Riflery.* The safety and practice of handling a rifle. Target shooting in prone, kneeling, and standing positions. 1 q.h.

527.* *Handball and Squash.* Rules and techniques for singles and doubles play in handball and squash. Strategy and skill development are emphasized. 1 q.h.

528.* *Physical Conditioning.* Strenuous large group activities including body contact sports (such as wrestling and deck hockey) to develop strength and improve cardiovascular condition. 1 q.h.

529.* *Recreational Games.* Fundamentals, skills, techniques, strategy, and rules of racquetball, paddle tennis, table tennis, shuffleboard, and other recreational games. 1 q.h.

530.* *Aquatics I.* Introduction to swimming and survival skills. Floating, drownproofing, basic swim strokes (side, elementary back and front crawl), beginning diving and simple aquatic games. This course is designed for the student who cannot swim; it is not open to swimmers. 1 q.h.

531.* *Aquatics II.* Intermediate swimming. Introduction to back crawl, breaststroke and butterfly. Techniques in underwater swimming, use of mask, snorkle and fins. Elementary lifesaving skills and refinement of basic springboard diving. This course is not designed for the advanced swimmer. 1 q.h.

533.* *Competitive Swimming.* Refinement and variations of the four basic strokes used

*Course requires locker and towel fee.

*Course requires locker and towel fee.

in racing competition. Racing dives and close course turns. Organization and conduct of meets. Prereq.: Advanced swimmer. 1 q.h.

534.* *Synchronized Swimming.* Fundamentals of synchronized swimming, stunts, and aquatic art. Individual and group work on selection and development of swimming and routines. Prereq.: Intermdiate swimmer. 1 q.h.

535.* *Diving I.* Fundamentals of springboard diving concentrating on the one-meter board. Prereq.: Intermediate swimmer. 1 q.h.

536.* *Diving II.* Intermediate to advanced springboard diving at one and three meters. Prereq.: Diving I or consent of instructor. 1 q.h.

537.* *Swim-Trim.* Fitness through swimming and conditioning exercises tailored to the individual needs of the student. Prereq.: Ability to swim 50 yards. 1 q.h.

540.* *Modern Dance I.* Elementary techniques of body movement. Rhythmic fundamentals and improvisation. 1 q.h.

541.* *Modern Dance II.* Intermediate dance techniques, composition, and improvisation. Prereq.: Modern Dance I or consent of instructor. 1 q.h.

542.* *Dance Composition.* Basic principles of form and structure applied to choreography. Prereq.: HPE 541 or consent of instructor. 1 q.h.

545. *Folk and Square Dance I.* European and Mediterranean folk dances. American square dances, and mixers. Beginning materials and practice. 1 q.h.

546. *Folk and Square Dance II.* Intermediate and advanced folk and country dances, materials, and practice. Prereq.: Folk and Square Dance I or consent of instructor. 1 q.h.

547. *Advanced Balkan & Mediterranean Folk Dance.* Emphasis on intermediate and advanced dances of the Balkan and Mediterranean countries. Traditional dances with emphasis on style and refinement of skills. Prereq.: HPE 546 or consent of instructor. 1 q.h.

550.* *Children's Dance.* A laboratory class emphasizing appropriate dance and rhythmical activities for the elementary school child. Includes exploratory movement, simple locomotive skills, and rhythmical activities using hand apparatus. 1 q.h.

*Course requires locker and towel fee.

551.* *Elementary School Gymnastics.* A laboratory class emphasizing gymnastic activities for the elementary school child. Includes exploratory work on mats and apparatus. 1 q.h.

565. *Self Defense.* The defensive techniques of Judo and Ikydo designed to counter attacks with a club, knife, gun or bare fist. Balance, control, safety, and falling will be stressed. 1 q.h.

622.* *Motor Skill Analysis for the Elementary Teacher.* Performance and analysis of locomotor, non-locomotor, and manipulative skills. Basic movement, movement education, and materials for elementary children. Characteristics of children and their relation to physical education and concept development. Credit can be applied toward University physical education requirement. Prereq.: Sophomore standing, elementary education major, or permission of instructor. 1 q.h.

633R.* *Water Polo.* Skills, organization, rules, and strategy of water polo. Prereq.: Advanced swimming. 1 q.h.

The following activity classes meet the University activity requirement and are scheduled three contact hours per week for one-hour credit to allow for travel time to Mill Creek Park.

500. *Field Hockey* Methods and practice of skills, techniques, rules, and strategy of field hockey. 1 q.h.

501. *Soccer.* Skills, techniques, strategy, and rules of soccer. 1 q.h.

504. *Touch Football.* Skills, rules, and techniques of touch football. 1 q.h.

506. *Track and Field.* Skills, techniques, rules, and organization of track and field events. 1 q.h.

508. *Ice Skating.* Ice skating for the novice or nonskater. Classes held at Mill Creek Park Skating Rink. 1 q.h.

522. *Tennis I.* Fundamental skills of tennis including forehand and backhand drives and service. Basic rules, strategy, and methods. Classes held at Mill Creek Park. 1 q.h.

523. *Tennis II.* Theory and practice of intermediate to advanced tennis skills and play. Classes meet at Mill Creek Park. Prereq.: Tennis I or intermediate skill level. 1 q.h.

The following classes can also be used to meet the University activity requirement.

*Course requires locker and towel fee.

549.* *Varsity Competition.* Credit toward the University physical education activity requirement may be obtained through competition in the varsity athletic programs. Varsity sports not requiring locker fees will be listed in quarterly buoletins as 549N. Prereq.: Consent of the coach. 1 q.h.

614. *Foundations of Physical Education.* Development of a general knowledge and understanding about physical activity for life. The rules, mechanics, social benefits and other aspects of a variety of sports. 3 q.h.

630R.* *Lifesaving Techniques.* Instruction in lifesaving techniques, water rescue, use of mask, fins and snorkle, poolside first aid, resuscitation, and pool maintenance. Red Cross Lifesaving certificate granted upon satisfactory completion of course. Prereq.: Advanced swimming ability. 3 q.h.

631.* *Water Safety Methods for Instructors.* Techniques for teaching and supervising swimming, lifesaving, and skin diving. Poolside safety and first aid, introduction to pool maintenance and management. A swimming and lifesaving instructor's certificate granted upon satisfactory completion of course. Prereq.: An *active* lifesaving certificate. 3 q.h.

632.* *Skin and Scuba Diving.* Basic skin diving with use of mask, fins, and snorkle. Scuba diving skills with use of tank and regulator. Emphasis on diving physics, physiology, lifesaving, first aid, and safety skills related to skin and scuba diving. Prereq.: 400-yard swim within 15 minutes. 3 q.h.

Non-Activity Classes

590. *Health Education.* A study of mental health and related problems, family life, chronic and communicable diseases, environmental and consumer health. 3 q.h.

595. *Introduction and Concepts of Health and Physical Education.* An introduction to the related professions for Health and Physical Educators. The concepts, goals, and objectives upon which health and physical education is based. 2 q.h.

601. *First Aid and Personal Safety.* For the student who will not be professionally involved with first aid. The emphasis will be on accident prevention and personal safety with knowledge and skills to meet the needs of most emergency situations and to prepare the student for First Aid certification. 3 q.h.

604. *Cardio-Pulmonary Resuscitation.* Basic life-support methods including artificial circulation and clearing obstructed airways. Certification will be offered. Two hours laboratory practice per week. 1 q.h.

623. *Physical Education for the Pre-School Child.* Methods, materials, equipment, and class management techniques appropriate for pre-school age children including aquatics, exploratory movement experiences, perceptual-motor screening, rhythmical games, and gymnastic-like experiences. Includes field experiences with pre-school children. 2 hours lecture and 2 hours of lab and/or field experience. 3 q.h.

634. *Aquatic Programs.* Organization and administration of aquatic programs with emphasis on management; design and construction of aquatic facilities. 2 q.h.

635. *Openwater Scuba Diving.* A series of classroom lectures and a minimum of four openwater dives to give the student practical experiences in physiological and psychological stress, underwater navigation, effects of hypothermia, decompression, repetitive diving, and rescue techniques. Students completing this course receive basic scuba certification. Five hours of lecture and 10 hours of laboratory quarterly. Prereq.: HPE 632 or equivalent. 1 q.h.

650. *Techniques of Officiating Soccer.* Analysis and interpretation of rules, theory and practice of officiating soccer. Prereq.: HPE 501 or equivalent. 1 q.h.

651. *Techniques of Officiating Basketball.* Analysis and interpretation of rules; theory and practice of officiating basketball. Prereq.: HPE 503R or equivalent. 2 q.h.

653. *Techniques of Officiating Football.* Analysis and interpretation of rules; theory and practice of officiating football. Prereq.: HPE 505R or equivalent. 2 q.h.

655. *Techniques of Officiating Track and Field.* Analysis and interpretation of rules; theory and practice of officiating track and field. Prereq.: HPE 506R or equivalent. 1 q.h.

656. *Techniques of Officiating Volleyball.* Analysis and interpretation of rules; theory and practice of officiating volleyball. Prereq.: 502R or equivalent. 1 q.h.

657. *Techniques of Officiating Swimming.* Analysis and interpretation of rules; theory and practice of officiating swimming. 1 q.h.

658. *Techniques of Officiating Gymnastics.* Analysis and interpretation of rules and skills;

*Course requires locker and towel fee.

*Course requires locker and towel fee.

theory and practice of judging gymnastics. Prereq.: HPE 517 or equivalent. 2 q.h.

659. *Techniques of Officiating Baseball and Softball.* Analysis and interpretation of rules, theory and practice of officiating baseball and softball. Prereq.: HPE 504 or equivalent. 2 q.h.

660. *Techniques of Officiating Field Hockey.* Analysis and interpretation of rules, theory and practice of officiating field hockey. Prereq.: HPE 500 or equivalent. 1 q.h.

665. *Scientific Principles in Personal Conditioning.* A course of instruction and laboratory experience in physical activity, designed to provide an opportunity to personally discover the benefits and scientific reasons for continued participation in fitness-enhancing activities. Detailed discussions related to physical activity. One hour of lecture and two hours of laboratory per week. One hour of credit may be applied toward the three-hour University physical activity requirement. Prereq.: Admission to NOUCOM-YSU program or consent of instructor or department chairman. 2 q.h.

670. *Analysis of Movement Patterns.* Designed to help the prospective physical educator critically analyze movement patterns. Commonalities of movement patterns will be studied and application made in laboratory sessions. One hour lecture, two hours lab. per week. Prereq.: 10 activity credits. 2 q.h.

680. *School Health Program.* School health programs including an emphasis on school health services, healthful school living, and administration. Prereq.: HPE 590. 4 q.h.

690. *Personal Health Problems I.* Personal health information for the future teacher. Emphasis placed upon mental and physical health-related problems including drug abuse, nutrition, and chronic and communicable disease. Prereq.: HPE 590 and sophomore standing. 3 q.h.

692. *Human Sexuality.* An interdisciplinary approach to the study of human sexuality. Holistic approach dealing with questions that concern the college student of today. Includes problems in sex education, the nature of sexuality, the relationship of sex to personal identity, and sexual mobility. Factual information will be given in the areas of physiological reproduction, contraception, venereal disease, sexual dysfunctions, techniques, and response. Listed also as Biology 692, Psychology 692, and Sociology & Anthropology 692. Prereq.: HPE 590. Does not count toward General University requirements. 4 q.h.

697. *Camping.* A lecture-laboratory class examining the specific skills and problems encountered in camping, i.e., shelter, clothing, food, transportation and site selection. 2 q.h.

700. *Pre-professional Laboratory Experience.* The student will assist in a YSU activity course under the supervision of a qualified faculty member. The student must attend the activity class regularly and is expected to teach small groups or parts of lessons when appropriate. Prereq.: Sophomore standing and consent of instructor. 1 q.h.

701. *Pre-professional Laboratory Experience in Health Education.* Students will assist in a YSU health education course under the supervision of a qualified faculty member. The student must attend the class regularly and shall teach small groups or parts of lessons when appropriate. Prereq.: HPE 690 and consent of instructor. 1 q.h.

721. *Health Education in the Elementary Grades.* Emphasis on organization and materials for health instruction and the teacher's role in the school health program. Designed for the elementary classroom teacher. Approximately 15 hours of laboratory and/or field work required. Not open to the Health or Physical Education majors. Prereq.: HPB 590 and junior standing. 3 q.h.

722.* *Physical Education in Elementary Grades for the Classroom Teacher.* Principles, methods, materials and organization of activities for the elementary school child. Includes games, rhythmic activities, stunts, and skill development. Active participation required including approximately 15 hours of field work in area schools. Prereq.: HPE 622 and third quarter sophomore standing. 3 q.h.

750. *General Techniques of Coaching.* A study of the science of coaching. Organization, psychology, ethics, conditioning, and general aspects of the coaching profession. Prereq.: 10 activity credits, or junior standing AND consent of instructor. 2 q.h.

751. *Coaching of Baseball.* Theory, methods, organization, techniques of teaching and coaching baseball. Prereq.: HPE 750. 2 q.h.

752. *Coaching of Basketball.* Theory,

*Course requires locker and towel fee.

*Course requires locker and towel fee.

methods, organization, and techniques of teaching and coaching basketball. Prereq.: HPE 750. 2 q.h.

753. *Coaching of Football.* Philosophy, theory, methods, techniques, and organization applied to the coaching of football. Prereq.: HPE 750. 2 q.h.

754. *Coaching of Track and Field.* Methods, theory, techniques, and organization of coaching track and field. Prereq.: HPE 750. 2 q.h.

755. *Coaching of Wrestling.* Methods, fundamental techniques of coaching and officiating wrestling; practical application of teaching wrestling maneuvers and interpretation of rules. Prereq.: HPE 750. 2 q.h.

756. *Coaching of Individual Sports.* Theory, methods, organization and techniques of teaching and coaching individual sports such as golf, tennis, and swimming. Prereq.: HPE 750. 2 q.h.

761.* *Elementary Physical Education Foundations.* Fundamental skills and analysis correlating the study of basic movement with movement education in relation to children. Lesson planning to develop cognitive, motor, and affective concepts. Approximately 15 hours of field work in area schools required. Prereq.: HPE 550, 551, 670. 2 q.h.

762. *Elementary Physical Education Methods.* Principles, methods, and materials for the elementary level teacher. Includes curriculum planning, observation, and approximately 20 hours experience in area schools. Prereq.: 10 activity credits and HPE 761. 2 q.h.

763. *Internship in Elementary Physical Education.* Supervised elementary school experiences including teaching, video tape evaluations, use of media, team teaching and interdisciplinary approaches. Will require practical experience in the elementary schools. Prereq.: HPE 722 or HPE 762. 3 q.h.

765.* *Physical Education in the Secondary Schools.* Principles, objectives, methods, materials and curriculum development for teaching physical education in secondary schools. Approximately 20 hours of field work in area schools is required. Prereq.: 10 activity credits and junior standing. 4 q.h.

780.* *Methods of Teaching Dance.* Rhythm and movement fundamentals; methods and materials of teaching folk and square and social dance. Prereq.: HPE 545. 2 q.h.

785.* *Teaching of Modern Dance.* Methods and materials of teaching modern dance. Prereq.: HPE 780. 2 q.h.

790. *Advanced Health.* An analysis of the healthy human body and how it is affected by disease. Study includes representative conditions of the cardiovascular, reproductive, nervous, respiratory, excretory, and endocrine areas. Prereq.: HPE 590 and 690. 4 q.h.

791. *Community Health.* A study of the need for organized community health efforts. Emphasis is placed upon the problems including chronic and communicable diseases, environmental health, world health, etc., and the public and private agencies involved in their solutions. Prereq.: HPE 590. 4 q.h.

793. *Personal Health Problems II.* Personal health information for the future teacher. Emphasis placed upon current health problems associated with neuromuscular, skeletal and integumentary conditions and environmental hazards. Prereq.: HPE 690. 3 q.h.

794. *Secondary School Health Education.* Curricula, principles, planning, methods, and materials for the teaching of health in the secondary schools. Laboratory and/ or field work is required. Two hours lecture, four hours laboratory per week. Prereq.: HPE 701. 4 q.h.

795. *Kinesiology and Applied Anatomy.* Muscular structure and function in relation to physical movement; analysis of fundamental movements. Prereq.: Biology 551 and 552. 4 q.h.

796. *Elementary School Health Education.* Curricula, principles, planning, methods, and materials for the teaching of health in the elementary schools. Laboratory and/or field work is required. Two hours lecture, four hours laboratory per week. Prereq.: HPE 701. 4 q.h.

801. *Internship in Health Education.* Supervised teaching experience on or off campus for the health education major. Four hours per week laboratory or field experience. Prereq.: HPE 794,796,892. 2 q.h.

846. *Folk Dance Institute in Yugoslavia.* A two week session in Yugoslavia (city to be designated each year) with intensive teaching of Balkan dance by specialists from the Balkan countries. Prereq.: HPE 780 or consent of instructor. 4 q.h.

850. *History, Principles and Philosophy of Physical Education.* Scientific, sociological,

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psychological and philosophical principles of physical education and the historical development of current concepts and programs. Prereq.: Junior standing. 4 q.h.

855. *Organization and Administration of Physical Education.* Study and practice of techniques and methods in the organization and administration of school physical education programs. Prereq.: Junior standing. 3 q.h.

860.* *Tests and Measurements.* A study of the various tests in the field of health and physical education, including uses and interpretation of elementary statistical techniques. Prereq.: Senior standing. 4 q.h.

880. *Organization of Recreation and Intramural Programs.* The function of recreation in society including the personnel, administration, leadership, facilities, and programs. Principles governing participation in intramural activities, their organization and administration. Prereq.: Junior standing. 4 q.h.

885. *International Physical Education.* The study of methods, techniques and administration of physical education of various foreign countries and their influence on physical education in the United States. Prereq.: HPE 850. 2 q.h.

892. *Teaching of Sex Education; Methods and Materials.* To prepare teachers of sex education in the elementary and secondary schools. Emphasis upon human sexuality, reproduction, and responsible family living. Prereq.: HPE 680 or permission of instructor. 3 q.h.

893. *Workshop in Health Education.* Concentrated study of a selected topic related to health education. The department will select and announce the topic and determine the credit hours based on frequency and duration of workshop meetings. May be repeated for a maximum of eight hours with change in topic. Prereq.: HPE 794 and HPE 796. 1-4 q.h.

894. *Workshop in Physical Education/Athletics.* Concentrated study of a selected topic related to physical education and/or athletics. The department will select and announce the topic and determine the credit hours based on frequency and duration of workshop meetings. May be repeated for a maximum of eight hours with change in topic. Prereq.: HPE 750, HPE 762 or HPE 765, or consent of instructor. 1-4 q.h.

895. *Adapted Physical Education.* The organization of physical education activities selected to meet the individual needs of exceptional students. Approximately 15 hours of field work required. Prereq.: HPE 795. 3 q.h.

896.* *Physiology of Exercise.* Physiological bases and function of the body during exercise, stress, and muscular activity. Prereq.: HPE 795 and HPE 860. 4 q.h.

897. *Prevention and Care of Athletic Injuries.* Practical and theoretical aspects of treatment of injuries in an athletic program; supplies, therapeutic equipment, taping and wrapping, and techniques of conditioning. Prereq.: HPE 795 and 750. 2 q.h.

898. *Seminar: Physical Education.* Study of special and current problems in the field of physical education. Prereq.: Senior standing. 2 q.h.

899. *Seminar: Health.* Study of special and current problems in the field of health education. Prereq.: Senior standing and consent of instructor. 2 q.h.

*Course requires locker and towel fee.

HISTORY

Professors Blue, Domonkos, Huang, Roberts, Skardon and Slavin. Associate Professors Beelen (Chairman), Berger, May, Earnhart, Friedman, Jenkins, Kulchycky, Ronda, Satre and A. Smith. Assistant Professors Amadi and Darling.

The student majoring in history must complete, in addition to the general University requirements (see *Requirements for the Degree*, at the beginning of the College of Arts and Sciences) the following group requirements listed below. It is recommended that the student select courses with assistance from the advisor. Certain courses are to be preferred to others according to whether one contemplates graduate study, secondary school teaching, or some other career.

GROUP A — History 605, 606, 655, 656.

GROUP B — Select three courses from the following courses:

701, 702, 704, 706, 708, 710, 712, 713, 715, 716, 717, 718, 720, 721, 723, 725, 726, 730, 731, 732, 733, 736, 738, 739, 741, 742, 743, 744, 745, 746, 747, 748, 749, 788, 801.

GROUP C — Select three courses from the following courses:

699, 735, 751, 752, 753, 754, 755, 758, 759, 760, 761, 762, 765, 766, 767, 768,

*Course requires locker and towel fee.

769, 782, 783, 784, 786, 787, 790, 791, 792, 793, 794, 795, 802, 850, 851.

GROUP D — Select three courses from the following courses:

611, 661, 662, 663, 770, 771, 772, 775, 776, 777, 778, 779, 780, 781, 796, 797, 798, 799, 800, 811, 812, 813, 820, 821, 822, 860.

Students transferring 30 or more quarter hours in history to YSU from another institution must meet the group requirements listed above to obtain a major in history for graduation. At least five of the courses in Groups B, C, and D must be taken at YSU.

It is recommended that the student in choosing electives should acquire as broad a background as possible in the social sciences and the humanities. Particular attention is called to courses offered by the departments of English, economics, political science, philosophy, art, music, geography, and sociology, and to the humanities courses. Students contemplating graduate work in history should consider taking more foreign language courses than the minimum necessary to meet the general degree requirement. Finally, the student is reminded that the Department of History takes seriously the University's emphasis on the importance of adequate competence in the English language (see *Proficiency in English*, in the General Requirements and Regulations section); when there is need, students majoring in history should include in their programs advanced composition courses and courses in speech.

Lower Division Courses

601. *American Military History.* Identical with Military Science 601R. 3 q.h.

605. *History of the United States, I.* A general survey of the political, social, and economic development of the United States to 1877. 4 q.h.

606. *History of the United States, II.* A general survey of the political, social, and economic development of the United States from 1877 to the present. 605 is not a prerequisite. 4 q.h.

611. *Latin America.* A general course which surveys Latin America from its beginnings to the present. Emphasis is upon late 19th and 20th century developments. 4 q.h.

655. *History of Western Civilization, I.* The development of Western culture from its earliest appearance in the Near East until 1715. 4 q.h.

656. *History of Western Civilization, II.* The development of Western culture from 1715 to the present. 655 is not a prerequisite. 4 q.h.

661. *Middle Eastern Civilization.* A survey of North Africa, the Middle East, and the Indian subcontinent from ancient times to the present with special emphasis upon nationalist movements in these regions in the past two centuries. 4 q.h.

662. *History of Asian Civilization.* A history of institutions and cultures of East and Southeast Asia from ancient times to date. Emphasis on East Asia. 4 q.h.

663. *African Civilization.* A general survey of the cultural, political, social and economic development of Africa from antiquity to the present. Emphasis will be placed on early Africa, European contact and impact on Africa, nationalism and independence. An attempt will be made to place Africa in the larger context of world history. 4 q.h.

699. *History of Science and Medicine.* A survey of science, technology, and medicine in their relationship to the social and intellectual currents of societies from ancient times to the present. 4 q.h.

Upper Division Courses

701. *Colonial America.* A thorough examination of the origins and development of English colonization in America to the middle of the Eighteenth century. Special emphasis is placed on Colonial social structure, economic patterns, and political behavior. Prereq.: History 605. 4 q.h.

702. *The Revolution and the Constitution.* A careful examination of the causes and consequences of the American Revolution taking into account both British imperial policies and Colonial responses to those policies. The origins of the Constitution and the creation of the American Republic are also considered. Prereq.: History 605. 4 q.h.

704. *The Age of Jefferson and Jackson.* An intensive study of the Age of Jefferson and Jackson covering the period 1789 to 1840. Prereq.: History 605. 4 q.h.

706. *America Before the Civil War, 1840-1860.* An intensive study of the deepening sectionalism of the country culminating in the outbreak of the Civil War. Prereq.: History 605. 4 q.h.

708. *The Civil War and Reconstruction.* An intensive study of military aspects: problems of the Confederacy: the political, social, and

economic effects of the war on American society; and problems of Reconstruction in both the North and the South. Prereq.: History 605. 4 q.h.

710. *Emergence of Modern America.* History of the United States from Reconstruction to the Treaty of Versailles, having as its major theme the transformation of this nation from a rural to an urban society and the political role played by immigrant-ethnic-minority groups in early 20th century political development. Emphasis will be placed on historical interpretation. Prereq.: History 606. 4 q.h.

712. *Recent America.* The United States in modern times. This course will deal with domestic and international affairs from World War I through World War II. It will emphasize historical interpretation as seen through selected readings. Prereq.: History 606. 4 q.h.

713. *Contemporary America.* The United States in contemporary times. Emphasis will be placed on economic, social, political, and cultural issues of historical significance dividing and uniting the nation in the period from World War II to the present. Prereq.: History 606. 4 q.h.

715, 716. *Economic History of the United States, I, II.* A historical examination of the economy of the United States to 1877 and from 1877 to the present. Special emphasis is placed on such areas as agriculture, manufacturing, transportation, and commerce, money and banking, and business and labor organizations. Prereq.: History 605 for 715. History 606 for 716. 4+4 q.h.

717, 718. *Constitutional History of the United States I, II.* The development of the American Constitutional system from the beginning of the Republic to 1900 and from 1900 to the present time. Treatment emphasizes the formation and evolution of the Constitution by judicial decisions and the influence of political change. Prereq.: History 605 for 717, History 606 for 718. 4+4 q.h.

720, 721. *Social and Cultural History of the United States, I, II.* An examination of the social and cultural development of the United States through the Civil War and from the Civil War to the present with emphasis on the relationship between ideas and society. Attention is given to such areas as immigration, religion, education, family, and social structure, painting, architecture, literature, and music. Prereq.: History 605 for 720, History 606 for 721. 4+4 q.h.

723. *History of Ideas in America.* An examination of intellectual currents in American life touching upon both leading American thinkers and trends of popular culture. Prereq.: History 605 or 606. 4 q.h.

725. *Lyrics in American Folk Music: A Historical Survey.* Of the content, development, and significance of American folk music lyrics within a historical framework by means of the historical method. Types of folk music, such as ballads, blues, country, protest, and contemporary, are the tools for a historical examination of the stabilizing and divisive elements that are a part of the American heritage. Prereq.: History 605 or 606, or consent of instructor. 4 q.h.

726. *History of Women in the United States.* Analysis of the various roles and contributions of women in American history. Prereq: History 605 and 606. 4 q.h.

730, 731. *Black Man in American History, I, II.* A historical study of the Black Man's role in, and contributions to, the political, social, and economic development of the American society from the Colonial period to the present. Prereq.: History 605 for 730, History 606 for 731. 4+4 q.h.

732. *The West in American History, I.* A study of the American frontier from the colonial period to 1800, with special emphasis on the role of the Indians. This course examines the social, political, and economic currents in frontier life. Prereq.: History 605. 4 q.h.

733. *The West in American History, II.* A study of the advancing nineteenth century frontier in the United States and its effect on the political, economic, and social conditions of the country as a whole. Special emphasis will be given to the role of the Indian. Prereq.: History 605. 4 q.h.

735. *Urban History.* A survey of the history of cities in Western Europe to the Industrial Revolution. Prereq.: History 655. 4 q.h.

736. *Urban History in the United States.* The history of cities in the United States from 1607 to the present. Prereq.: History 605 or 606. 4 q.h.

738, 739. *The South in American History I, II.* Origins and development of local institutions, ideology, culture, economics, politics, and racial difficulties from Colonial times through the Civil War and from Reconstruction to the present. Emphasis is on the nineteenth century prior to the Civil War and the problems faced by the southern regional attitude following Reconstruction. Special

attention is given, in the second half, to the difficulty the South faced in the twentieth century. Prereq.: History 605 for 738, History 606 for 739. 4+4 q.h.

741, 742. *Diplomatic History of the United States I, II.* A study of American foreign relations as determined by interaction between domestic and international pressures since the beginning of American independence to 1900 and from 1900 to the present time. Prereq.: History 605 for 741, History 606 for 742. 4+4 q.h.

743. *Labor in American History.* The impact of labor and the labor movement upon the course of American history, with emphasis on the historical context surrounding labor conditions and on the political and social implications of the labor movement. Prereq: History 606 4 q.h.

744. *The History of American Business.* A study of business enterprise and its historical setting from 1800 to the present. The course emphasizes the interaction of economic and political forces as a factor helping to explain the position occupied by business enterprise in late 20th-century American society. Prereq.: History 605. 4 q.h.

745. *Readings in American History to 1865.* An intensive study of the more important general works, monographs, and biographies dealing with the major problems in the United States history from Colonial times to the Civil War. Prereq.: 18 hours of history or consent of instructor. 4 q.h.

746. *Readings in American History from 1865 to the Present.* An intensive study of the more important works, monographs, and biographies dealing with the major problems in the United States history from the Civil War to the present. Prereq.: 18 hours of history or the consent of instructor. 4 q.h.

747. *History of the United States and Pennsylvania.* The history of the State of Pennsylvania with emphasis on its position in general American history. Prereq.: History 605 or 606. Open for those needing credit for Pennsylvania teaching certificate. 3 q.h.

748. *History of Ohio.* A study of the important events and movements that have shaped Ohio history in the social, economic, religious and political areas. Prereq.: History 605 or 606. 4 q.h.

749. *Philosophy of History.* The same as Philosophy 749. 4 q.h.

751. *Byzantine History.* A study of the eastern Roman Empire from its origins as a Greek trading outpost in the 8th century B.C.E. to its conquest by Mehmet Faith in 1453. The course will concentrate upon church problems, dynastic disputes, and the impact of invaders from the north and south. Prereq.: History 655. 4 q.h.

752. *History of Greece.* Aegean civilization from the third millennium B.C.E. through the Diadochi. Lectures focus upon archaeology, the culture of Crete and Mycenae, the Dorian Invasions, the Clash of Athenian and Spartan cultures, Persia, and Macedonian hegemony in the time of Alexander. Prereq.: History 655. 4 q.h.

753. *History of Rome.* The Roman World from its mythological foundations in the 8th century B.C.E. through the Principate. Special emphasis upon Italian archaeology in the second millennium, Etruscan civilization, the Carthaginian Wars, the Julian Civil War, and the Five Good Emperors. Prereq.: History 655. 4 q.h.

754. *Early Middle Ages.* History of Western Europe from the decline of Rome to the tenth century. This course begins with an examination of the theories concerning the decline of Rome and the beginning of the Middle Ages and concludes with an analysis of the economic, social, and cultural forces following the Viking invasions. Especially highlighted will be the Carolingian Renaissance, Caesaro-papism, Benedictine Monasticism, and early feudalism. Prereq.: History 655. 4 q.h.

755. *Late Middle Ages.* History of Western Europe from the tenth century to the Waning of the Middle Ages. This course will study the following themes: the renaissance of the 12th century, Scholasticism, introduction of Aristotelianism in the West, the rise of cities, nationalism, and the decline of Europe in the 13th and 15th centuries. Prereq.: History 655. 4 q.h.

758. *Renaissance Europe.* A survey of the major cultural, political, social, and economic development of Europe from the end of the Middle Ages into the sixteenth century. This course will examine the humanism of Bude, Erasmus, and Vires; the political theories of Macchiavelli and Thomas More; The aesthetics of DaVinci, Michelangelo, etc.; and the contributions of the Italian cities. Prereq.: History 655. 4 q.h.

759. *The Reformation Era.* The history of Europe from the Lutheran Revolt to the peace of Westphalia in 1648. This course will treat

the following themes: the causes of the Protestant Reformation; the impact of Luther, Wycliffe, Calvin, and Huss; the Counter Reformation; and the Council of Trent. Prereq.: History 655. 4 q.h.

760. *From Westphalia (1648) to the French Revolution (1789).* This course introduces the rise of modern states, mercantilism, diplomatic and military struggles, Gallicanism and Jansenism in religion, and the classical and baroque in art and literature. The emphasis is on France under Louis XIV and then the Old Regime of Louis XV and Louis XVI. The 18th century is examined with its Machiavellian politics, its court intrigues, but also its stimulating intellectual life reflected in the term, The Enlightenment. Prereq.: History 656. 4 q.h.

761. *French Revolution and Napoleon (1789-1815).* The French Revolution is examined in detail especially from its outbreak to the fall of Robespierre. The political role of urban crowds, the revolt of peasants and bourgeoisie, the rise of political clubs, efforts at founding a civic religion, party struggles, the fall of the Bourbon monarchy and the birth of the first French Republic are examined and analyzed. The last portion of the course deals with the rise of Napoleon, his political role, his military campaigns, the reconstruction of Europe, and his fall at Waterloo. Prereq.: History 656. 4 q.h.

762. *The Second World War.* Strategic, tactical and diplomatic aspects. All areas will be examined. Non-military aspects of the conflict, such as social, economic and political developments, will receive some consideration. Prereq.: History 656 or 606. 4 q.h.

765. *Europe from the Congress of Vienna to the Franco-Prussian War (1815-1871).* Such movements as nationalism, the impact of the Industrial Revolution. Marxism, the growth of democracy, liberalism, and conservatism, romanticism and realism, reform and revolution, form the main themes of this period. The course is divided into two historic periods, from 1815 to the revolutions of 1848 and from 1848 to 1871 with the emphasis on the unification of Italy and of Germany and the new Europe that arose as a consequence. Prereq.: History 656. 4 q.h.

766. *Europe from the Franco-Prussian War to World War I.* The impact of the Paris Commune; revolutionary movements and their contradictions; imperialism, political antisemitism, and the images of war; the Bismarckian international order and its suicide. Prereq.: History 656. 4 q.h.

767. *Europe from World War I to the Present.* War, revolutions, and the European order; Versailles and its contradictions; the Fascist response to Communism and Depression; the interraction of democracies, Fascisms, and Stalinism in the making of the Cold War and World War II. Prereq.: History 656. 4 q.h.

768, 769. *History of Germany I, II.* The struggle for supremacy in Germany; The Prussianization of Germany; Weimar and Hitler. Emphasis on the relationship of domestic to foreign policy, civil to military power, and political institutions to social developments. Prereq.: History 656. 4+4 q.h.

770. *The Far East.* Arts and philosophy, economic development, social, and political institutions, and international relations from ancient times to the beginning of modernization, including China, Japan, and Korea. Prereq.: History 662 or consent of instructor. 4 q.h.

771. *China in Traditional Times.* China's history, arts, philosophy, religion, political and social institutions, and international relations from beginnings to the mid-nineteenth century. Prereq.: History 662, Sociology-Anthropology 772, or consent of instructor. 4 q.h.

772. *History of Modern China.* China's history from the mid-19th century to date, with emphasis on western impact, industrialization, intellectual trends, the revolution of 1911, national reconstruction, student movements, the rise of communism, and the contemporary scene. Prereq.: History 662 or consent of instructor. 4 q.h.

775. *History of South and Southeast Asia in the 19th and 20th Century.* Patterns of Western colonialism, revolutionary forces of nationalism and communism, and current problems in Burma, Ceylon, Cambodia, India, Indonesia, Laos, Malaysia, Pakistan, the Philippines, Thailand, and Vietnam. Prereq.: History 662 or consent of instructor. 4 q.h.

776. *History of Modern Japan.* An analysis of Japan's history from the Meiji Restoration to date, including industrialization, the party movement, intellectual development, the rise and fall of militarism, postwar reconstruction, and current problems. Prereq.: History 662 or consent of instructor. 4 q.h.

777, 778. *History of Russian Empire I, II.* A concise study of the history of Russia from the rise of Muscovy to 1825 and from 1825 to

the dissolution of the Russian Empire with special attention devoted to the Russian Revolution. Prereq.: History 655 for 777, History 656 for 778. 4+4 q.h.

779. *History of the Soviet Union.* A survey of Soviet history, diplomacy and tactics from the Bolshevik Revolution to the present. Great stress is placed on the achievements and shortcomings of Communism in Russia, its satellites, as well as the non-Russian nations that make up the Soviet Union. Prereq.: History 656. 4 q.h.

780, 781. *History of Eastern Europe, I, II.* An intensive study of the histories of the varying nations that make up Eastern Europe from earliest times to 1600 and from 1600 to the present. The course examines the developments and contributions of Lithuania, Poland, Rus-Ukraine, Russia, Slovakia, as well as the Caucasian nations to world civilization from the earliest to most recent times. Prereq.: History 655 for 780, History 656 for 781. 4+4 q.h.

782. *History of the Balkans.* A study of the history of Southeastern Europe from the fourth century to the present. Examined also are the Byzantine and Ottoman Empires, and their influences on this area. Great stress is placed on development prior to and since World War I. Prereq.: History 656. 4 q.h.

783, 784. *Economic History of Europe I, II.* A study of the economic development of Europe to 1780 and from 1780 to the present. Emphasis will be placed on rural and town economy in the Middle Ages, the transition to capitalism and the development of modern industrial society. Prereq.: History 655 for 783, History 656 for 784. 4+4 q.h.

786. *The Expansion of Europe.* Lectures and readings on the expansion of Europe overseas 1415 to 1815; the oceanic discoveries, the colonial systems of the European countries, the influence of European expansion on non-European peoples and on Europe itself. Prereq.: History 655. 4 q.h.

787, 788. *History of Population Movements I, II.* Trends in world population in their relation to history, migration, and urbanization. Human demography and ecology; Various measurements of the size, density, and distribution of population as well as their economic and social environments. Prereq.: Junior standing (listed also as Economics 787 and Sociology 787). 4+4 q.h.

790. *English History, I.* The history of England from earliest times to 1714. Emphasis is on the political and cultural evolution of the English people in early times, the expansion of interests in the Elizabethan Age, and the establishment of parliamentary government in the Stuart Era. Prereq.: History 655. 4 q.h.

791. *English History, II.* Great Britain from the accession of the Hanovers to the present.The emphasis is on domestic affairs of Great Britain and Ireland — the intellectual impact of Newton and Darwin, commercial and industrial developments and the attendant social and political problems. Prereq.: History 656. 4 q.h.

792, 793. *British Empire and Commonwealth I, II.* A study of the development of the British Empire from the collapse of the Old Empire in 1783 to 1867 and from 1867 to the present day. Areas stressed include the West Indies, Africa, Australia, Canada, and India. Movements emphasized are the development of colonial institutions, the formation of colonial policy, the struggle to suppress the slave trade, the expansion of the empire, the growth of colonial nationalism, and the evolution of the Commonwealth. Prereq.: History 656. 4+4 q.h.

794. *History of Leisure in Modern England.* A study of the growth of leisure activities in England from the 18th century to the present, with emphasis on the transition from rural to urban-centered activities, the impact of technology, and the emergence of mass spectator sports. Prereq.: History 656. 4 q.h.

795. *Historical Origins of Spanish Culture.* A survey of the development of the Western Mediterranean from early times, emphasizing the emergence of a true Spanish culture and its rise to dominance in the 16th and 17th centuries. Prereq.: History 655. 4 q.h.

796. *The Ancient Near East.* A study of civilizations in Mesopotamia and Egypt from the fourth millennium B.C. to the Graeco-Persian Wars. Special emphasis is placed upon literary materials from Sumer, Babylon, and Egypt. Prereq.: History 661. 4 q.h.

797. *Early Islamic Civilization.* The Middle East from the Jahiliyah Period to the Mongol Invasions, with special emphasis upon the religious reformation of Muhammad and Islamic culture under the Abbasids. Prereq.: History 661. 4 q.h.

798. *The Ottoman Empire.* History of the Middle East from the rise of the Ottomans in the 14th century to the Young Turk Revolution in 1908-09. Prereq.: History 661. 4 q.h.

799, *The Middle East in Modern Times.* An intensive study of this region since World War I. Special emphasis upon the clash of Arab nationalism. Zionism, oil, diplomacy, and colonialism. Prereq.: History 661. 4 q.h.

800. *Jewish History.* An overview of Jewish History in the past twenty centuries. Emphasis will be given to achievements in the arts, sciences, and politics, as well as to precedents for the Holocaust. Prereq.: History 655, 656. 4 q.h.

801. *Select Problems in American History.* A study in depth of specific problems in American history in such special areas as economics, political theory, and cultural and intellectual history. May be repeated. Prereq.: Consent of instructor. 4 q.h.

802. *History of Ideas in Western Europe Since 1500.* This course will treat the impact of new ideas on the various social classes in Western Europe and Great Britain through the Age of Science, the Enlightenment, the Darwinian Revolution and the Age of Anxiety. Prereq.: History 656. 4 q.h.

811. *Mexico and the Caribbean.* Emphasis is upon Mexico, Colombia, Venezuela, and the Central American republics. Special consideration is given to 20th century Mexico. Prereq.: History 611 or consent of instructor. 4 q.h.

812. *History of South America.* The Spanish American republics and Brazil are considered. Prereq.: History 611 or consent of instructor. 4 q.h.

813. *History of Latin American-United States Relations.* Survey of Latin American-U. S. relations from the founding of the New World to the present with greatest emphasis placed upon the 20th century. Prereq.: History 611 or consent of instructor. 4 q.h.

820. *History of West Africa to 1800.* The history of West Africa to 1800 focusing on the people, cultural traditions, economic and political developments, state-building, and early contacts with the west. Prereq.; History 663. 4 q.h.

821. *History of West Africa Since 1800.* The significance of West Africa since 1800, with emphasis on the 19th century. Such topics as slave trade, commercial revolution, religious and imperialistic rivalry, and the reaction of West Africans will be studied. Prereq.: History 663. 4 q.h.

822. *History of Modern Africa South of the Sahara.* A study of the impact of colonialism upon the people of Africa south of the Sahara, with emphasis on the 20th century. Such topics as colonial administration, rise of nationalism, Pan-Africanism, decolonization, and problems of modern Africa will be studied. Prereq.: History 663. 4 q.h.

850. *European Area Study.* A course in Western European history and geography with emphasis on intellectual and artistic development. The class is made up of about 30 members supervised by the History and Geography faculty, and tours cities in Austria, Belgium, France, Germany, Italy, The Netherlands, Switzerland, and the United Kingdom. The course is designed to provide maximum opportunity to develop an understanding for the history, geography, and culture of the Western Europe area. The course grade is based upon a term paper which must be submitted within 60 days after the end of the course. Prereq.: Junior standing. 9 q.h.

851. *Select Problems in European History.* A study in depth of specific problems in European history in such special areas as economics, political theory, and cultural and intellectual history. May be repeated. Prereq.: Consent of instructor. 4 q.h.

860. *Select Problems in Third World History.* A study in depth of specific issues in African, Asian, Latin American or Middle Eastern histories in such specific areas as economics, political theory, and cultural and intellectual history. May be repeated once for credit. Prereq.: Consent of instructor. 4 q.h.

HUMANITIES

Professor Hare; Associate Professors Baird, Henke, and Solimine; English Department staff.

The Humanities courses study works of many literatures, chosen for their literary or philosophical relevance to contemporary culture. Works not written in English are read in translation. In particular, the material of Humanities 830, 831, 832 and 834 is drawn from the great writings of the Western world; these courses have the purpose of acquainting students with a body of writing which has been extremely influential in the development of Western culture and relating that material to the society in which it was produced and to our present society.

The University offers a minor and a combined major in Humanities. A comprehensive teaching field in Humanities (90 quarter

hours) is also possible. For detailed requirements for the major or the teaching field, the student should consult Professor Ives.

Full credit for all Humanities courses is acceptable toward a major in English and toward the University general requirement in the area of the humanities. Credit in Humanities 631, 830, or 831 is acceptable toward a major in Latin at the discretion of the chairman of the Department of Foreign Languages and Literatures. Humanities 631, 830, or 831 may also be counted as equivalents of philosophy courses in the philosophy/theology/fine arts requirement for teacher certification.

The completion of English 550 and 551 or their equivalents is prerequisite to any Humanities course — except 610, which may be taken by students with sophomore standing who have completed English 550.

Lower Division Courses

610. *Introduction to World Literature.* A non-technical, non-historical course in which important works are read in translation and discussed critically for increased enjoyment and understanding. Designed for non-English majors to fulfill their humanities requirement. Listed also as English 610. 4 q.h.

620. *Introduction to African Literature.* A survey of the literature of modern Africa and the influence on it of the oral tradition, with emphasis on such Black writers as Mphalele, Soyinka, Senghor, Achebe, and Tutoula. Reading in English. Listed also as English 620. 4 q.h.

631. *Mythology in Literature.* An introductory study of myths, chiefly classical, with some attention to their origins and cultural significance, and of literary works, both classical and modern, in which myths are used. Listed also as Classical Studies 631 and English 631. 3 q.h.

Upper Division Courses

Prerequisite to the following courses: any literature course in English or Humanities; or junior or senior standing; or consent of the English department chairman.

830. *The Western Tradition: Ancient Drama.* Readings in English from Greek and Roman drama and dramatic criticism and *The Book of Job,* with emphasis on Greek tragedy. Listed also as Classicla Studies 830 and English 830. 4 q.h.

831. *The Western Tradition: Ancient Prose and Poetry.* Readings in English from such Greek and Roman writers as Homer, Herodotus, Thucydides, Plato, Aristotle, Lucretius, Cicero, and Virgil. Listed also as Classical Studies 831 and English 831. 4 q.h.

832. *The Western Tradition: Medieval and Renaissance.* Readings in English from writers of these periods, with emphasis on Dante, Machiavelli, More, Montaigne, Cervantes, and Shakespeare. Listed also as English 832. 4 q.h.

834. *The Western Tradition: Eighteenth and Nineteenth Centuries.* Readings in English from writers of these periods, with emphasis on Locke, Voltaire, Rousseau, Goethe, Balzac, Dostoevsky, and Nietzsche. Listed also as English 834. 4 q.h.

864. *Modern Drama.* A study of the modern drama, excluding American, with emphasis on continental writers such as Ibsen, Strindberg, Chekhov, Pirandello, Sartre, Ionesco, Brecht, and Beckett. Listed also as English 864. 4 q.h.

876. *The Modern Novel.* A study of the 20th-century novel, excluding American, with emphasis on continental writers such as Kafka, Mann, Hesse, Gide, Camus, and Proust. Listed also as English 876. 4 q.h.

880. *Medieval Epics and Romances.* A comparative study of English and European literature before 1500, with emphasis on the *Volsungasaga,* the *Nibelungenlied,* the *Roman de la Rose,* and the *Chanson de Roland.* Reading in translation. Listed also as English 880. 4 q.h.

ITALIAN

A major in Italian consists of 45 quarter hours above the elementary level.

Courses in Italian literature (705, 706, 801, 802, 830, 840, and 885 if the topic deals with literature) satisfy the humanities requirement.

Lower Division Courses

See pages 36 and 107 for pre-college and college language requirements.

501, 502, 503. *Elementary Italian I, II, III.* Fundamental principles of grammar taught through oral and written exercises and the reading of simple prose. The stress in this course is on the aural-oral facility. The prerequisite for Italian 502 is Italian 501 or equivalent; the prerequisite for Italian 503 is Italian 502 or equivalent. 4+4+4 q.h.

601. *Intermediate Italian I.* Elementary

composition and conversation based on grammar review. Reading material is chosen both to furnish a basis for study of Italian literature and to provide a working knowledge of the modern language. Prereq.: Italian 503 or equivalent. 4 q.h.

602. *Intermediate Italian II.* A continuation of Italian 601. Prereq.: Italian 601 or equivalent. 4 q.h.

640. *Selected Topics.* Development of language skills through the study of a topic with practical applications to some area such as business, social studies, cultural trends, etc. May be taken three times for credit if the topic is different. Total credit in Italian 640 may not exceed 8 q.h. A maximum of 4 q.h. may be applied to the major. Prereq.: Italian 602, or equivalent, or permission of instructor. 2-4 q.h.

Upper Division Courses

705. *Survey of Italian Literature I.* A survey of Italian literature from the Middle Ages to the end of the 17th century. Prereq.: Italian 602 or equivalent. 4 q.h.

706. *Survey of Italian Literature II.* A survey of Italian literature from the beginning of the 18th century to the present. Prereq.: Italian 602 or equivalent. 4 q.h.

718. *Italian Grammar and Composition.* A study in depth of the most difficult points of Italian grammar through analysis of modern texts and elementary composition. Prereq.: Italian 602 or equivalent. 4 q.h.

719. *Advanced Italian Composition.* A course designed to develop writing skills through compositions on assigned topics. Prereq.: Italian 718 or consent of the instructor. 4 q.h.

729. *Italian Civilization.* A condensed study of the geography, history, culture, and social heritage of Italy. The course is taught in Italian, and class discussion is included for improvement of oral facility. Prereq.: Italian 602. 4 q.h.

730, 731. *Conversational Italian.* Facility in oral expression developed through exercises and discussion of assigned topics, and through prepared and extemporaneous situational dialogues. Need not be taken in sequence. Prereq.: Italian 602 or equivalent. 4+4 q.h.

801. *Italian Literature of the 14th Century.* A study of the Italian literature of the 14th century with concentration on Dante's *Divine Comedy.* Prereq.: Italian 705. 4 q.h.

802. *Italian Literature of the 16th Century.* A course dealing with the literature of the Renaissance and concentrating on Ariosto, Bandello, Machiavelli, and Tasso. Prereq.: Italian 705. 4 q.h.

830. *Italian Literature of the 19th Century.* A study of the literature of the 19th century with concentration on Leopardi, Manzoni, Pascoli, and Carducci. Prereq.: Italian 706. 4 q.h.

840. *Italian Literature of the 20th Century.* A study of the literature of the 20th century and its movements and innovations, with concentration on D'Annunzio, Ungaretti, Quasimodo, Montale, Moravia, and Pirandello. Prereq.: Italian 706. 4 q.h.

885. *Special Topics.* Studies in Italian language, literature, or civilization ranging from medieval to modern times. Topic is announced each time course is offered. May be taken three times for credit, if content is not repeated. Prereq.: Italian 705 and/or 706, depending on the topic, or consent of the instructor. 2-4 q.h.

JOURNALISM

Assistant Professor Mason; Instructor Martindale; English Department staff.

The University does not offer a major in journalism, but enables a student, with the advice and approval of the major advisor, to minor in journalism; to complete a 30-hour program leading to certification in journalism on the secondary school level; or to complete a 14-hour program which satisfies the journalism distribution for certification in communications on the secondary level. All three programs include practical experience with the University's laboratory newspaper, the *Jambar.* The journalism student who plans a professional career should get a broad liberal arts education, with emphasis on the social sciences and the humanities.

All journalism courses (except 625) give full credit in English.

Lower Division Course

625. *Selected Topics In Journalism.* Study of unusual approaches to reporting and of special kinds of journalistic publications not covered in depth in other journalism courses. Topic announced each time course is offered. May be repeated once with change in topic. *Does not count toward a major in English.* Prereq.: English 551. Listed also as English 625. 3-5 q.h.

Upper Division Courses

715. *Journalism I.* News reporting and writing. The news room in newspaper production. Prereq.: English 551 or its equivalent. Listed also as English 715. 4 q.h.

716. *Journalism II.* Feature writing, copy editing, and make-up. Prereq.: Journalism 715, its equivalent, or consent of the instructor. Listed also as English 716. 4 q.h.

717. *Journalism III.* Techniques and approaches in writing special kinds of articles such as reviews, editorials, and reports of speeches and meetings. Prereq.: Journalism 715. 4 q.h.

721L, 722L, 723L. *Journalism Workshop I, II, III.* Application through student publications of the principles of Journalism 715, 716. Students register for three hours unless specially authorized by the instructor. Each course may be repeated once. Prereq. or concurrent: Journalism 715, or consent of the instructor. Listed also as English 721L, 722L, 723L. 3-6, 3-6, 3-6 q.h.

815. *American Periodicals.* The origins and development of the American periodical press, with emphasis on its contributions to American literature. Prereq.: Any literature course in English or Humanities (except 708, 709, or 710); or junior or senior standing; or consent of the department chairman. 4 q.h.

LATIN

A major in Latin consists of 45 hours of Latin above the elementary level. With the consent of the department chairman, some of these hours may be taken in other relevant courses. The inclusion of Ancient Greek is recommended.

Students who plan to teach high school Latin must complete 30 hours of Latin above the elementary level.

Courses in Latin literature (707, 708, 709, 809, and 885 if the topic deals with literature) satisfy the humanities requirement.

Lower Division Courses

See pages 36 and 107 for pre-college and college language requirements.

501, 502, 503. *Elementary Latin I, II, III.* Essentials of Latin grammar and some reading of connected prose. Designed for pre-law students and English and modern language majors as well as for students planning to continue in Latin. The prerequisite for Latin 502 is Latin 501 or equivalent; the prerequisite for Latin 503 is Latin 502 or equivalent. 4+4+4 q.h.

601. *Intermediate Latin I.* A rapid review and expanded study of Latin grammar, with prose exercises, accompanied or followed by careful reading of miscellaneous selections from Catullus, Ovid, and other writers. Prereq.: Latin 503 or equivalent. 4 q.h.

602. *Intermediate Latin II.* Reading of selections from Cicero and other writers. Prereq.: Latin 601 or equivalent. 4 q.h.

Upper Division Courses

The prerequisite for any 700-level Latin course is Latin 602 or equivalent. The prerequisite for any 800-level course is at least one 700-level Latin course.

707. Cicero. Selections from the *Letters, De Senectute,* or comparable work, and composition based on review of case usage and the mood and tense uses. 4 q.h.

708. *Pliny the Elder and Pliny the Younger.* Selections from *Naturalis Historia* of Pliny the Elder and from the *Letters* of Pliny the Younger, and composition based on review of case usage and the mood and tense uses. 4 q.h.

709. *Latin Poetry.* Selections from Horace's *Odes,* Ovid's *Metamorphoses,* and works of other writers, with attention to style, method and content. 4 q.h.

804. *Advanced Composition and Syntax.* A synthesizing review of the principles of Latin syntax and practice in writing Latin, with special attention to differences in idiom, structure, and style between English and classical Latin. Prereq.: Three Upper Division Latin courses. 3 q.h.

809. *Virgil's "Aeneid."* A study of the *Aeneid* based on a reading of the whole poem in English and of significant passages in Latin, with attention to style and method as well as to content. Required of candidates for certification as high school Latin teachers. 3 q.h.

885. *Special Topics.* Studies in Latin language, literature, or Roman civilization. Topic is announced each time course is offered. May be taken three times for credit, if content is not repeated. 4 q.h.

LINGUISTICS

Professors Dykema, Hankey, and Secrist; Associate Professors Murphy and Viehmeyer; Assistant Professor Knapp; English

Department staff; Foreign Languages and Literature Department staff.

The University does not offer a major in linguitics, but enables a student, with the advice and approval of the major advisor, to elect a minor in linguistics. The student planning such a minor should consult the major advisor, especially to determine whether a course offered in both linguistics and the major department should be counted as linguistics or not.

Upper Division Courses

750. *Language and Culture.* A survey of the role of language structure as an instrument in human behavior and social institutions. Prereq.: English 551 or its equivalent, and Anthropology 602 or its equivalents. Listed also as English 750 and Sociology/Anthropology 750. 4 q.h.

752. *Anthropology: Historical Linguistics.* Identical with Sociology/Anthropology 752. 4 q.h.

753. *Anthropological Linguistics.* Identical with Sociology/Anthropology 753. 4 q.h.

755. *Principles of Linguistic Study.* Identical with English 755. 4 q.h.

757. *Development of the English Language.* Identical with English 757. 4 q.h.

758. *English Grammar.* Identical with English 758. 4 q.h.

759. *Topics in English Linguistics.* Identical with English 759. 4 q.h.

867, 868. *Comparative German Linguistics.* Identical with German 867, 868. 3+3 q.h.

869. *Applied French Phonetics.* Identical with French 869. 3 q.h.

855. *Special Topics.* Identical with German 885, Italian 885, and Spanish 885, when the special topic announced is a linguistics course. 4 q.h.

MATHEMATICS

Professors Dillon, Mavrigian, and Santos; Associate Professors Altinger, Barger, Brown (chairman), Buoni, Burden, Ciotola, Demen, Faires, Hurd, Klein, Kozarich, Knauf, and Whipkey; Assistant Professors Biles, Cleary, Dandapani, Goldstein, Helling, Mortellaro, Poggione, Rodfong, Rodabaugh, and Sumramanian.

Mathematics may be the major subject for the degree of Bachelor of Arts, Bachelor of Science, or Bachelor of Science in Education.

The student majoring in mathematics must complete, in addition to the general University requirements (see *Requirements for the Degree*, at the beginning of the College of Arts and Sciences section) a minimum of 48 quarter hours of courses.

Specified required courses are Mathematics 571, 572, 673, 674, 701, 725, 727, 743, 871. In addition, Computer Science 600 is required of all mathematics majors. Students preparing for secondary school teaching must take Education 800M (Special Methods-Mathematics) and at least one of the courses Mathematics 730 or 732.

Electives may be selected from any of the 700-level and 800-level courses listed except as otherwise noted. It is recommended that the student select electives with assistance from the advisor. Certain courses are to be preferred to others according to whether one contemplates graduate study, secondary school teaching, or a career in business, industry or government.

For the Bachelor of Science degree, the student majoring in mathematics may minor in one of the following: biology, chemistry, computer science, economics, physics, or one engineering discipline (chemical and materials science, civil, electrical, industrial, mechanical). The candidate for the Bachelor of Arts degree may choose any minor.

Students who plan to go on to graduate work in mathematics should study at least one of the languages: French, German or Russian.

Students receiving transfer credit from another institution for courses in mathematics should consult the Department Chairman to determine how they apply toward the major requirements.

Statistics. Students with a major in mathematics can elect to concentrate in statistics by taking the following courses: mathematics 743, 841, 843, 844, 845. Mathematics 815 is also recommended but does not count toward the minimum requirements for a mathematics major. Non-mathematics majors, including students under the Individualized Curriculum Program (p. 41), may obtain counseling in statistics by reporting to the Department of Mathematical and Computer Sciences.

Mathematics Minors. Recommended mathematics courses for students who minor in mathematics are as follows:

For scientific applications: Mathematics 571, 572, 673; and two or more of 674, 705,

725, 743, 841, 760, 861.

For business applications: Mathematics 542, 550, 650; and two of 685, 714, 815.

For mathematical theory: Mathematics 571, 572, 673, 701, 725. Further information may be obtained from the Department.

Lower Division Courses

500. *Algebra I.* A first course in algebra. Evaluated as one high school credit for the A.B. and B.S. degrees. A student taking this course must take an additional five quarter hours to complete the requirements for the degree. The credit/no entry grading system is used. 5 q.h.

501. *Geometry.* A first course in geometry. Evaluated as one high school credit for the A.B. and B.S. degrees. A student taking this course must take an additional five quarter hours to complete the requirements for the degree. The credit/no entry grading system is used. Prereq: One unit of high school algebra or Mathematics 500. 5 q.h.

502. *Algebra II.* Review of fundamental concepts and topics from elementary algebra. The number system; algebraic operations; functions and graphic representation of function, solutions of linear and quadratic equations. Prereq.: One unit of high school algebra or Mathematics 500. 5 q.h.

503. *Trigometry.* An analytical study of trigonometric functions and their inverses, identities, equations, and applications: logarithmic and exponential functions; complex numbers. Prereq.: Two units of high school algebra and one unit of high school geometry, or Mathematics 501 and 502. 5 q.h.

505. *Precalculus Mathematics.* Concepts and techniques required for the calculus sequence. Topics to be covered include solution of inequalities, graphing of algebraic and transcendental functions, and a brief review of other subjects from algebra, trigonometry and analytic geometry which will be needed for the study of calculus. Prereq.: Three high school units of college preparatory mathematics including trigonometry, or Mathematics 502 and 503, or the consent of the instructor. 4 q.h.

515, 516. *Mathematics for Elementary Teachers I, II.* Concepts needed in understanding mathematics taught in elementary schools. The number system, its structure and algorithms, using concepts of set, operation, relation, and proof. Informal geometry; selected topics from Euclidean, non-Euclidean, coordinate, finite, and projective geometry. Additional topics may include algebra, number theory, probability and statistics. Mathematics 515 is a prerequisite for Mathematics 516. 5+4 q.h.

523, 524. *Survey of Mathematics I and II.* A course for non-science majors emphasizing some of the basic ideas in mathematics. The stress is on concepts rather than on manipulatory skills. Prereq.: One unit of high school algebra and one unit of high school geometry, or Mathematics 500 and 501. 4+4 q.h.

523H, 524H. *Honors Survey of Mathematics I, II.* An honors course for non-science majors stressing fundamental concepts of mathematics. The approach is more sophisticated than that is Mathematics 523, 524. Prereq.: One unit of high school algebra and one unit of high school geometry, or Mathematics 500 and 501, and honors standing based upon high school mathematics achievement and the score on the ACT or CEEB examination. 4 + 4 q.h.

531. *Mathematics of Business.* A general study of business mathematics embracing number and algebraic concepts. Percentage, discounts, simple and compound interest, present values, polynomials, exponents, first degree equations, logarithms, and progressions with business applications are studied. Prereq.: One year of high school mathematics. 5 q.h.

542. *Applied Finite Mathematics.* This course is designed for business majors but is open to others. Specific topics include matrix algebra, an introduction to linear programming, probability, and mathematics of finance. Prereq.: One unit of high school geometry or Mathematics 501, and two units of high school algebra or Mathematics 502. 5 q.h.

550. *Calculus for Social, Managerial, and Life Sciences I.* A short course in calculus of algebraic functions of one variable with applications. The course is intended for students in business, those in the social and biological sciences, and others who desire an introduction to the subject. Specific topics include the concepts of limit, derivative, integral and applications. Prereq.: One unit of high school geometry or Mathematics 501, and two units of high school algebra or Mathematics 502. 5 q.h.

570, 670, 770. *Applied Mathematics I, II, III.* The elements of differential and integral calculus, with emphasis on applications. Ana-

lytical geometry, differentiation and integration techniques, series representations, and numerical methods. Introduction to differential equations, transform calculus, and to Fourier analysis. This is a basic methods course particularly adopted for those who require applied topics in mathematics. It is not applicable toward the mathematics major. Prereq.: Mathematics 502 and 503 are required for 570. 570 is required for 670 and 670 is required for 770. 5+4+4 q.h.

571, 572, 673, 674. *Calculus I, II, III, IV.* A sequence of integrated courses in analytic geometry and calculus. A detailed study of limits, derivatives, and integrals of functions of one and several variables and applications. Prereq.: Four high school units of mathematics (including Trigonometry) with an average of C or better and satisfactory score on ACT or CEEB examination, or Mathematics 505 is required for Mathematics 571. 571 is required for 572; 572 for 673; and 673 for 674. The 505 prerequisite may be waived by the Mathematics department chairman. 5, 4, 5, 4 q.h.

571H, 572H, 673H, 674H. *Calculus I, II, III, IV Honors.* A sequence of honors courses in analytic geometry and calculus with more emphasis on rigor than the Mathematics 571, 572, 673, 674 sequence provides. A detailed study of limits, derivatives, and integrals of functions of one and several variables and their applications. Especially recommended for mathematics majors who can qualify. Prereq.: Four high school units of mathematics (including trigonometry) with an A or a high B average and a high score on the ACT or CEEB examination are required for Honors Calculus 571H. 571H is required for 572H. 572H is required for 673H and 673H is required for 674H. 5, 4, 5, 4 q.h.

580H, 581H, 681H. *Biomathematics I, II, III.* An integrated course in mathematics and computer science having as a central theme the role of mathematical models in explaining and predicting phenomena in the life sciences. Specific topics include: computer programming, differential and integral calculus, matrix operations, linear programming, differential and difference equations, probability, Markov chains, and applications to the biological sciences. Prereq.: Admission to NOUCOM-YSU program or equivalent qualifications with consent of instructor and department chairman is required for Mathematics 580H. 580H or Computer Science 600 is required for 581H, and 581H is required for 681H. 2+4+4 q.h.

617. *Algebra for Elementary Teachers.* Basic ideas and structure of algebra, including equations, inequalities, absolute value, graphing, and other algebraic systems including finite ones. Prereq.: Mathematics 516 or consent of teacher. 5 q.h.

618. *Geometry for Elementary Teachers.* A study of space, plane, and line as sets of points, considering separation properties and simple closed curves; the triangle, rectangle, circle, sphere, and other figures considered as sets of points with their properties developed intuitively; concept of measurement. Prereq.: Mathematics 617 or consent of teacher. 4 q.h.

650. *Calculus for Social, Managerial and Life Sciences II.* A continuation of Mathematics 550 with emphasis on logarithmic and exponential functions and their applications, calculus of functions of several variables, and differential and difference equations. Prereq.: Mathematics 550. 4 q.h.

685. *Applied Matrix Algebra.* Properties of matrices and their application, eigen-value problems and Markov chains. Not open for credit to students who have completed Mathematics 725. Prereq.: Mathematics 550 or 570 or 572 or permission of the instructor. 4 q.h.

Upper Division Courses

701. *Introduction to Set Theory.* Algebra of sets; relations and functions as sets; cardinal and ordinal numbers; the well-ordering theorem and equivalent principles. Emphasis is on logical development of the subject. Prereq.: Mathematics 673 or consent of instructor. 4 q.h.

705, 706. *Differential Equations I, II.* Introduction to theory and solution of ordinary differential equations with applications; partial differential equations; Fourier series; boundary value problems; Laplace transform; vector analysis. Prereq.: Mathematics 673 for 705, Mathematics 674 and 705 for 706. 4+4 q.h.

714. *Probability and Statistics.* A course in probability and statistics with applications. The course is intended for students of the liberal arts, business, and education who desire an introduction into the subject. Specific topics include description of sample data, probability, frequency distributions, sampling estimation, testing hypotheses, correlation

*Students who have taken 740 (741) for credit cannot receive credit for 743 (841).

and regression. Not applicable towards the mathematics major. Prereq.: Two units of high school algebra or Mathematics 502. 5 q.h.

725. *Matrix Theory and Linear Algebra.* Matrices; matrix operations; linear transformations; applications. Prereq.: Mathematics 673. 4 q.h.

726. *Theory of Equations.* Solution of algebraic equations; theorems on roots of polynomial equations; symmetric functions; theory of determinants; numerical methods. Prereq.: Mathematics 673. 4 q.h.

727, 827. *Abstract Algebra I, II.* Number systems, groups, integral domains, fields, vector spaces, congruences, and polynomial rings. Prereq.: Mathematics 673 or consent of instructor is required for Mathematics 727. Mathematics 727 is required for Mathematics 827. 4+4 q.h.

730. *Foundations of Geometry.* The development of Euclidean and non-Euclidean geometries from postulate systems. Prereq.: Mathematics, 673. 4 q.h.

732. *Projective Geometry.* An introductory study of projective spaces of dimension one and two (in the setting of Euclidean geometry as well as axiomatically) by synthetic and analytical methods. Prereq.: Mathematics 673. 4 q.h.

743, 841. *Mathematical Statistics I, II.* An introduction to the theory of probability and statistics using the concepts and methods of calculus. Topics include discrete and continuous probability models, random variables and their distributions, sampling distributions, estimations, tests of hypotheses and regression. Prereq.: Mathematics 673 is required for Mathematics 743 and Mathematics 674 and 743 are required for 841. 4+4 q.h.

750. *History of Mathematics.* A survey of the historical development of mathematics. Prereq.: Mathematics 673. 4 q.h.

760. *Numerical Analysis.* The theory and techniques of numerical computation. The solution of an equation or a system of equations, the method or finite differences, interpolation methods, numerical differentiation and integration, least squares techniques. Prereq.: Mathematics 673 and Computer Science 600 or permission of the instructor. 4 q.h.

781H. *Biostatistics.* A course in statistics with applications relating to biological sciences. Specific topics include: descriptive statistics, testing hypotheses, analysis of count data, correlation, regression, non-parametric statistics and analysis of variance. Prereq.: Mathematics 681H or permission of instructor. 4 q.h.

801. *Applied Algebra for Elementary Teachers.* Applications of the basic ideas and structures in algebra. Algebraic systems and art, matrices and sociology, algebra and ecology, environmental statistics, and computers are among the possible topics. Not applicable toward the mathematics major. Prereq: Mathematics 617 or consent of instructor. 5 q.h.

802. *Applied Geometry and Probability for Elementary Teachers.* A course in geometric and probabilistic models and applications aimed at providing elementary school teachers with a broad understanding of the subjects. Not applicable toward the mathematics major. Prereq.: Mathematics 618 or consent of instructor. 4 q.h.

815. *Applied Statistics.* A course in application of correlation, regression, analysis of variance and related topics. Does not count toward the mathematics major. Prereq.: Mathematics 714 or equivalent, or permission of the instructor. 4 q.h

842. *Statistical Inference.* The study of estimation, hypothesis testing, non-parametric methods and design of experiments. Emphasis on applications. Prereq.: Mathematics 841. 4 q.h.

843, 844. *Theory of Probability I, II.* The nature of probability theory; combinatorial analysis; conditional probability; stochastic independence; binomial. Poisson, and normal distributions; laws of large numbers; limit theorems, generating functions; introductory topics of stochastic processes; applications. Prereq.: Mathematics 743 or consent of instructor is required for Mathematics 843 and 843 is required for 844. 4+4 q.h.

845.*Operations Research.* An introduction to operations research: problem formulation, linear programming, queueing theory, and design of research. Emphasis on mathematical methods. Prereq.: Mathematics 725 and 743 or consent of instructor. 4 q.h.

860. *Mathematical Logic.* An introduction to the study of theories in formalized languages and to the theory of models. Prereq.: Philosophy 619 or Mathematics 727 or consent of instructor. 4 q.h.

861. *Advanced Numerical Analysis.* Application of numerical methods and computer

analysis in the solution of ordinary and partial differential equations. Prereq.: Mathematics 760 and a course in FORTRAN programming, or consent of instructor. 4 q.h.

871,872 *Advanced Calculus I, II.* An introduction to the theory of functions of real variables with more rigorous presentation of the fundamentals of differential and integral calculus. Prereq.: Mathematics 674 is required for 871. Mathematics 871 is required for 872. 5+5 q.h.

875. *Introduction to Complex Variables.* Complex numbers and their geometrical representation, analytic functions of a complex variable, contour integration, Taylor and Laurent series, residues and poles, conformal mapping. Prereq.: Mathematics 674 and four quarter hours of mathematics at 700- or 800-course level, or consent of instructor. 4 q.h.

880. *Introduction to Topology.* An introduction to the basic concepts of general topology. Compactness, connectedness, and continuity in topological spaces. Prereq.: Mathematics 701, 871. 4 q.h.

890. *Mathematics Seminar.* Report and discussion of each student's in-depth study on a specific topic. Prereq.: Consent of instructor 2 q.h.

895. *Selected Topics in Mathematics.* The study of a standard mathematical topic in depth or the development of a special area of mathematics. May be repeated. Prereq.: Consent of instructor and department chairman. 2-5 q.h.

COMPUTER SCIENCE

Professors Mavrigian and Santos; Associate Professors Buoni and Burden; Assistant Professors Cleary, Dandapani and Goldstein.

The computer science major program leads to the degree of Bachelor of Science. The flexibility of the program allows the student many choices upon graduation. Three major possibilities are, first, all graduates will be qualified to pursue graduate work in computer science; second, all graduates will be qualified to work as operating systems analysts or systems programmers; and finally, the student may study another discipline as a minor field to become an application programmer in that discipline. In addition to the general University and College of Arts and Sciences requirements, a student majoring in computer science must complete the following requirements:

1. At least 49 quarter hours of courses in computer science, of which 32 quarter hours are specified and 17 quarter hours are electives. The specified courses are Computer Science 600, 601, 620, 700, 710, 805, 815 and at least two quarter hours of 890*. Electives in computer science are to be selected from any of the 700-level and 800-level Computer Science courses.

2. A minor in mathematics consisting of 26 quarter hours, all of which are specified. They are Mathematics 571, 572, 673, 725, 743, and 760.

3. At least 21 quarter hours of technical electives or at least 21 quarter hours in a second minor. Courses used to satisfy this requirement must be approved in advance by the Department of Mathematical and Computer Sciences.

Each student is assigned an advisor who provides guidance throughout the entire program.

Computer Science Minor

The following courses are recommended for students who wish to minor in computer science: Computer Science 600, 601, 620, 700 plus one of Computer Science 730, 760, 800, 820, or 880.

Lower Division Courses

530. *Computer Literacy.* The purpose of this course is to examine the principles upon which the modern stored-program computer operates, what it can and cannot do, and how to control it. This includes a study of algorithms, computer systems and their application, simulation and artificial intelligence, evolution and social impact of computers, and the use of an interactive language, e.g., BASIC, to control the computer in the performance of a procedure. Prereq.: One unit of high school algebra or Mathematics 500. 4 q.h.

600. *Introduction to Programming.* Application of data representation and flow-charting techniques to the solution of elementary problems. High-level programming languages will be used to teach a variety of techniques for solving problems with computers. Programming laboratories will be specialized to scientific and business languages. Prereq.: Mathematics 502 or Mathematics 531 or Computer Technology 502 or consent of instructor. 4 q.h.

601. *Advanced Programming.* Advanced problem-solving techniques using problem-oriented and machine-oriented languages.

Specialization in scientific or data-processing applications. Prereq.: Computer Science 600. 5 q.h.

620. *Computers and Programming.* A general study of basic computer structures, data representation, addressing techniques, instruction execution and machine language. Symbolic coding and assembly systems, macro definition and generation, and program segmentation and linkage. Absolute and relocatable loaders, I/O structures. Prereq.: Computer Science 600. 4 q.h.

650. *Language Topics.* Intensive language courses with emphasis on writing efficient programs. Topic 1: ALGOL; Topic 2: SNOBOL; Topic 3: LISP. May be repeated if topic changes. Each topic is open only to students without previous credit in that particular language topic. Prereq.: Programming experience or permission of instructor. 2 q.h.

Upper Division Courses

700. *Data Structures.* Study of data representations and input-output techniques in programming languages. The data structures of various languages will be comparatively applied in computational problems to reveal their advantages and limitations. Prereq.: Computer Science 601. 4 q.h.

710. *Introduction to Discrete Structures.* Basic set theory including functions and relations. Boolean algebra, propositional logic, graph theory and combinatorics. Prereq.: Mathematics 673 and Computer Science 600 or permission of instructor. 4 q.h.

730. *Introduction to Interactive Computing.* Study of the principles, methods and applications of interactive computing. Interactive terminals and languages. Interactive systems and virtual machines. Prereq.: Computer Science 600, or Computer Science 530 and consent of instructor. 4 q.h.

760. *Software Design Techniques.* Structured and modular programming. Advanced programming techniques. Program testing, debugging, and documentation. Linking and sharing of programs and data. Prereq.: Computer Science 620 and Computer Science 700. 4 q.h.

800. *File and Communication Systems.* A study of the basic functions, organizations and structures of file and communication systems. Analysis and realizations of these systems. Prereq.: Computer Science 620 and Computer Science 700. 4 q.h.

805, 806. *Systems Programming I, II.* Study of the various aspects of systems programming including assemblers, loaders, macro processors, compilers and operating systems. Prereq.: Computer Science 620 and CS 700 for CS 805, CS 805 for CS 806. 5 + 5 q.h.

810. *Computer Graphics and Terminals.* Study of problems and techniques in data collection and display. Prereq.: Computer Science 700. 4 q.h.

815. *Computer Logic and Organization.* A study of the logic basis and organization of digital computing systems and their components. Prereq.: Computer Science 620 and Computer Science 710. 4 q.h.

820. *Simulation.* Methods for modeling discrete-event systems by algorithmic approaches using simulation languages. Prereq.: Computer Science 620 and one of Mathematics 714 or 743, or permission of instructor. 4 q.h.

830. *Formal Languages and Syntactic Analysis.* Study of formal languages, especially context-free languages, and their applications to parsing and syntactic analysis. Prereq.: Computer Science 710 and 700 or permission of instructor. 4 q.h.

840. *Theory of Finite Automata.* The structural and behavioral aspects of finite automata. Prereq.: Computer Science 710 and Mathematics 725. 4 q.h.

845. *Information Storage and Retrieval.* An introductory course in information organization, storage and retrieval of natural language data. Automatic classification, abstracting and indexing, automatic question-answering systems, and search and statistical techniques. Prereq.: Computer Science 620 and 700 or permission of instructor. 4 q.h.

850. *Information Processing Systems.* A study of the organization, design, implementation and modification of large-scale information processing systems. Prereq.: Computer Science 620 and Computer Science 700. 4 q.h.

860. *Programming Language Structures.* A systematic approach to the study of the structures of programming languages. Formal descriptions, syntax, semantics and technical characteristics. Prereq.: Computer Science 700. 4 q.h.

880. *Introduction to Minicomputers.* Organization and architectural design. Software and operating systems. Systems interface. Appli-

cations. Prereq.: Computer Science 620 and Computer Science 700. 4 q.h.

890. *Computer Projects.* Independent study or research taken under the direction of a participating faculty member. May be repeated up to 10 quarter hours. Prereq.: Completion of a minimum of 30 quarter hours in computer science and permission of chairman. 2-5 q.h.

891-892. *Computer Science Internship Program.* An academic/industrial experience centered upon the development of a significant computer project in local industry under the direction of University faculty member(s) and designated member(s) of the participating firm. The student intern will be employed on a 20-hour-per-week basis for each of two successive academic quarters. Periodic review of the project will be conducted by the academic/industrial advisors. A final written report of the project must be submitted by the student at the conclusion of the internship. Prereq.: Mathematics or Computer Science major having completed 21 hours of computer science and 110 academic hours and approval of the department internship committee. 2 + 2 q.h.

895. *Special Topics* A study of special topics in computer science. May be repeated up to 10 quarter hours. Subject matter, credit hours & special prereq. will be announced in advance. Prereq.: Permission of instructor. 2-5 q.h.

MILITARY SCIENCE

Professor Lt. Colonel Robert E. Shea, Jr. (chairman); Assistant professors Major Thorpe and Captain Maravola, Sergeant Major Fairchild, Sergeant First Class Hazen, Staff Sergeant Brazeal and Army Staff Capt. Chapin and Cpt. Dugas.

An Army Reserve Officers' Training Corps (R.O.T.C.) program was established at this University in 1950 and is administered by the Department of Military Science.

The objective of the R.O.T.C. program is to select and train college students to qualify for commissions in the United States Army. Under present policy every graduate of the R.O.T.C. program who receives a degree after successfully completing four years of academic study is tendered a commission as a second lieutenant in the United States Army Reserve. A student who excells in academic and military subjects may be designated a distinguished military student.

Women may now enroll in R.O.T.C. and receive subsistence, scholarships, and a commission in the United States Army. Interested students should contact the Military Science Department for information.

To facilitate the development of leadership, R.O.T.C. students are organized into a corps of cadets which is commanded and administered by students, officers, and non-commissioned officers.

By agreement between the United Staes Government and the University, the Army furnishes the teachers, military equipment, textbooks, and student uniforms; the University furnishes all other facilities. *A Military Equipment Deposit and Fee* Is required of each student. It is refunded at the end of the academic year, when the government property issued is turned in (less the cost of any property lost or damaged).

Students who are veterans or who have taken R.O.T.C. work at other institutions receive credit for this training as determined by the chairman of the Department of Military Science.

The military science student has two options: enrollment in a four-year training program, or in a two-year training program.

The four-year program is made up of two courses: the basic course and the advanced course. The student enrolled in the four-year program must complete two years to receive credit for the basic course, and two additional years plus a six-week summer camp for consideration for an Army commission.

A compression of two years into one academic year is allowed when approved by the professor of military science. The basic course is open to any student who:

(1) is carrying at least 12 quarter hours, including R.O.T.C.;

(2) has enough remaining quarters at the University to complete the R.O.T.C. program;

(3) is between the ages of 14 and 30;

(4) is physically qualified;

(5) is a citizen of the United States, or applies for and receives permission to pursue the course: and

(6) has no convictions by a civil or military court other than minor traffic violations.

A student enrolled in the advanced course

*Computer Science 890 may be replaced by Computer Science 891-892.

is paid a retainer fee of $100.00 a month during the period enrolled, except for the five-week period attending the advanced summer camp (normally between the junior and senior years). At this camp all meals and lodgings are provided free, and the student is paid one-half the basic monthly pay of a 2nd Lieutenant, with less than two years' service (approximately $400), plus 10 cents a mile for travel to and from camp. The advanced course is open to any student who

(1) demonstrates a potential for becoming an effective Army officer;

(2) is a citizen of the United States or applies for and receives permission to pursue the course;

(3) complies with loyalty requirements;

(4) passes prescribed screening examinations;

(5) executes a written agreement to complete the advanced course, to attend R.O.T.C. summer camp at the time specified, and to accept a commission, if offered, into the Regular Army or the Army Reserve;

(6) has completed the basic course, or the six-week basic summer camp (for those enrolled in the two-year course), or receives credit by taking equivalent courses in the Military School Division, or receives credit as a result of honorable active military service of one year or more;

(7) has no convictions by a civil or military court for other than minor traffic violations;

(8) enlists in the United States Army Reserve; and

(9) is selected for the course by the chairman of the Department of Military Science and by the President of the University.

(10) will receive the commission *before* the 28th birthday or 32nd birthday with an approved waiver, or is a waiverable veteran.

To qualify for the two-year program the student must apply for enrollment during the sophomore year in college or have approximately two (2) years remaining in college, or be in junior college, complete an R.O.T.C. questionnaire, pass a screening examination and a physical examination, and be selected for participation. If selected the student, must complete a six-week basic summer training camp which is a substitute for the basic course required of the student in the four-year program. At this camp all meals and lodgings are furnished free, and the student is paid the monthly pay of a private E-1 (approximately $500), plus 10 cents a mile for travel to and from camp. When the student has met these requirements and has successfully completed the basic training camp the student is eligible to enroll in the R.O.T.C. advanced course in the junior and senior years. The advanced course in the two-year program is identical with the advanced course in the four-year program.

Two-year scholarships are available to qualified second-year cadets and at R.O.T.C. Basic Camp who are strongly motivated toward a career in the Army. Each scholarship pays for tuition, books, and laboratory expenses for the junior and senior years.

R.O.T.C. students should also read *Modifications for R.O.T.C Students*, in the General Requirements and Regulations section.

Lower Division Courses

501. *Military in Society.* R.O.T.C. on campus, military-industrial complex, classified military research and the university, civil-military relations in theory and practice. Branches of the Army. One hour of lecture and one hour of leadership laboratory. 1 q.h.

502. *Technological Development.* A study of the evolution of weapons with emphasis on the present generation of weapons and equipment. One hour of lecture and one hour of leadership laboratory. 1 q.h.

503. *U.S. Army and National Security.* Mission, capabilities and interdependence of the Armed Forces. The Army as a profession; code of an officer, code of conduct. One hour of lecture and one hour of leadership laboratory plus a field exercise. 1 q.h.

601R. *American Military History.* A survey of American military history from the origin of the United States Army to the present with emphasis on the factors which led to the organizational, tactical, logistical, operational, strategical, and social pattern found in the present-day Army. Three hours of lecture and one hour of leadership laboratory. 3 q.h

602R. *Map Reading and Land Navigation.* A comprehensive study of the techniques of land navigating by the use of maps and terrain analysis. An introduction and practical exercise in the use of the compass and aerial

photographs. One hour of lecture per week for each credit hour taken and one hour of leadership laboratory per week, plus one field practical exercise. 1 or 3 q.h.

603. *Basic Military Operations and Tactics.* Organization, composition, and mission of small units; techniques of weapons employment, combat formation, patrolling, and principles of offensive and defensive combat and their application to basic military teams. One hour lecture and one hour of leadership laboratory per week plus a field exercise. 1 q.h.

Upper Division Courses

701. *Principles of Military Teaching.* Educational psychology pertaining to the stages of military instruction; techniques used in planning and presenting instructions; speech for instructors; production and use of training aids. Two hours of lecture and one hour of leadership laboratory per week. 2 q.h.

702R. *Leadership.* Functional approach to the role of the leader, interaction between the leader of a small military unit and subordinates, and responsibilities of the leader. Two hours of lecture and one hour of leadership laboratory per week. 2 q.h.

703R. *Small Unit Tactics and Communications.* Infantry organization; fundamentals of offensive and defensive combat and their applications to the units of the infantry battalion. Principles of communications systems used within the Army Division. Two hours of lecture and one hour of leadership laboratory per week plus a field exercise. 2 q.h.

704. *Advanced R.O.T.C. Summer Camp.* Five weeks of field training, normally between junior and senior years, conducted at an Army installation. This concentrated practical training provides an opportunity to evaluate the student in his application of academic knowledge, gained in the campus classrooms, to daily leadership situations. Subjects include the organization, functions and missions of the U.S. Army; code of conduct and Geneva Convention; unit tactics; combined arms operations; communications; advanced map and aerial photograph reading; small arms marksmanship; and techniques of leadership. Prereq.: Permission of department chariman. 3 q.h.

801. *The Military Team.* To gain an understanding of command and staff evaluation, organization, and functions; processes for arriving at sound and timely decisions and translating decisions into plans and combat orders. Duties and responsibilities of company and battalion officers in the combat arms. Military intelligence; value and methods of producing intelligence. Two hours of lecture and one hour leadership laboratory per week. 2 q.h.

802. *Army Management.* Management procedures at the normal level of assignment for the newly commissioned officer to include administration, supply operations, motor maintenance, personnel management, personal affiars, and other related subjects. Lecture and case studies are utilized. Two hours of lecture and one hour leadership laboratory per week. 2 q.h.

803. *Human Relations, World Changes and Military Implications.* Military law; history and development of military law; fundamental concepts of military justice in the Armed Forces of the United States as provided for in the Uniform Code of Military Justice and the Manual of Courts-Martial; basic principles and methods employed in administering military justice. Human Relations; a survey of social problems and how they relate to the Modern Army. World Changes and Military Implications; an analysis of the United States and its international relations; relationship between international conflict, national purpose, national power, and national policies; summary of the economic power, war potential and inclination and apitude for the conduct of war of each major world power, block of nations and geographic area. Three hours of lecture and one hour of leadership laboratory per week plus a field exercise. 3 q.h.

Leadership Laboratory

This practical exercise period conducted for one hour weekly is required of all military science students. The course provides for experiences in discipline and the development of essential characteristics of leadership through progressive drill and schooling of the soldier.

TWO-YEAR MILITARY SCIENCE PROGRAM

Lower Division Courses

604. *Basic R.O.T.C. Summer Camp.* Six weeks training at a U.S. Army installation during the summer before the student's junior year. Concentrated instruction in the principles of leadership; map and aerial photograph reading; military customs, courtesies, and traditions; organization of the U.S. Army and the R.O.T.C.; military tactics; field sanitation and hygiene; first aid, counterinsurgency;

combat-intelligence; and physical training. This course is equivalent to the on-campus basic course. Prereq.: Completion of two years of college-level courses. 4 q.h.

Upper Division Courses

Military Science III and IV.

Courses 701, 702R, 703R, 704, 801, 802, and 803 as described above for the Four-Year Military Science Program. Prereq.: Completion of the R.O.T.C. Basic Course, R.O.T.C. Basic Camp or one year of active military service.

PHILOSOPHY AND RELIGIOUS STUDIES

Professors Greenman, Lucas and Reid; Associate Professors Eminhizer and Shipka; Assistant Professor Minogue (chairman); Instructor Bache.

I. Philosophy

A major is available for students who plan to enter the field of philosophy, the seminary, the ministry, or who wish a liberal arts background, especially for careers in religious education, social service, law, journalism, history, and allied fields.

The major consists of 45 quarter hours above the 500 level, including Philosophy 619, 700, 701, 702, 711, and either 820 or 821.

One-third credit toward the major in philosophy, up to three quarter hours, will be allowed for any course listed under Humanities.

Lower Division Courses

500. *Life's Ideals.* Analysis and clarification of the goals of human effort. The structure of an ideal. How an ideal functions. The status of ideals in the universe. Discussion of some ideals pertinent to undergraduate life. Selected readings appropriate to the students' experience. Open to freshmen. 4 q.h.

600. *Introduction to Philosophy.* The nature of philosophy and its relation to science, religion, and art; study of the philosophical approach and attitude, the basic problem areas in philosophy, and some typical philosophical viewpoints. 4 q.h.

619. *Introduction to Logic.* Introduction to syllogistic or classical logic, symbolic, and inductive logic. Emphasis will be placed on the rules of the syllogism, immediate inference, propositional functions, classes, truth tables, Venn diagrams; the use of analogy, generalization, the verification of hypotheses and the scientific method. 5 q.h.

Upper Division Courses

700. *History of Ancient Philosophy.* The development of philosophical thought in Western Civilization from the Pre-Socratics through the cosmologies of Plato, Aristotle and the Atomists; its ethical expression by Epicurus and the Stoics; and its religious involvement in the systems of Philo, Plotinus and Augustine. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

701. *History of Medieval Philosophy.* An examination of the medieval synthesis, with attention to its aims, methods, development and decline. Erigena, Roscellinus, Realism and Nominalism. Anselm and the Ontological Argument. Peter Abelard and Conceptualism. The Crusades and the new economics. The Grail legend and its influence on nationalism. Albertus Magnus, Thomas Aquinas and the return of Aristotle. Pantheism, mysticism and the rise of science. Duns Scotus and William of Ockham. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

702. *History of Modern Philosophy.* Development of philosophic thought from the Renaissance through the 19th century, with stress upon British empiricism, continental rationalism, and the critical philosophy of Kant and post-Kantian idealism. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

703. *Symbolic Logic.* The structure and properties of axiomatic systems; the theory of propositional and relational logic; the algebra of classes; related topics. Prereq.: Philosophy 619. 5 q.h.

704. *Woman: A Philosophical Study.* Examination of the writings of prominent women philosophers; inquiry into philosophical issues related to the concept of "woman," including concerns related to women's rights. Rereq.: Philosophy 600, or junior or senior standing. 4 q.h.

710. *Aesthetics.* Classical and modern philosophies of beauty, especially as they apply in criticism of the fine arts; the problem of the relative and the absolute in judgments of taste. Readings from representative writers in the field. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

711. *Ethical Theories.* Examination and evaluation of the major ethical theories in Classical, Dialectic, Pragmatic and Naturalis-

tic, Analytic and Positivist, and Existentialist thought. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

712. *Philosophy of Religion.* A philosophical consideration of the meaning and denotation of the concepts which have traditionally made up the subject matter of religion: the idea and nature of God, the soul, immortality, salvation, and the relation of these to human life. Attention will be given to the nature of religious knowledge as contrasted with scientific or logical knowledge. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

713. *Making of the Modern Mind.* The philosophic, religious, scientific, political and social developments out of which our present patterns of Western thought have arisen. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

715. *Philosophy of Science.* A philosophical consideration of some of the fundamental concepts and assumptions of the sciences: the nature of scientific knowledge; the relation of scientific to other kinds of knowledge and experience. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

725. *Biomedical Ethics.* An examination of ethical issues posed by the impact of biomedical research and technology on health care; selected issues in the philosophy of medicine; issues of patients' rights, including the right to health care; experiments on human subjects and problems of informed consent; genetic research and intervention; moral issues in death and dying, organ transplants and the allocation of scarce health resources. Prereq.: Four hours of philosophy or Sociology 745 or Psychology 780 or admission to NOUCOMYSU Program. 4 q.h.

749. *Philosophy of History.* A developmental inquiry into the views of history held by Greek, Roman, Christian, and modern scientific historians. Prereq.: History 655 or 656 or consent of the instructor. Listed also as History 749. 4 q.h.

800. *Theories of Knowledge.* The epistemological problem; position of the skeptic, pragmatist, empiricist, idealist, moderate realist, existentialist, and phenomenologist. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

804. *Classical Metaphysics.* The concept of being and reality in pre-Socratic naturalism and Parmenides. Its reformulation in Plato and its resolution in Aristotle. Scholastic metaphysics and the Analogy of Being. The fate of metaphysics after Descartes and the rise of empirical science. Its rejection in the "critical turn" of Hume and Kant. Its re-emergence in Hegel. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

805. *Contemporary Metaphysics.* The course of Western metaphysics since Hegel. Its resurrection within the naturalistic perspectives of Bergson, Alexander, Whitehead. Its relation to contemporary analysis and phenomenology. Its transformation in the sociological and psychological categories of Feuerbach and Marx. Schopenhauer and Nietzsche. Its relation to 20th century technological rationality in Heidegger and others. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

807. *Social Philosophy.* Philosophical analysis of the social concepts of freedom, power, authority, conflict, equality, alienation, and others. Emphasis on the extra-political dimensions of these concepts. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

808. *Political Philosophy.* Analysis of the metaphysical, epistemological, and axiological presuppositions of selected political theories. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

810. *Philosophical Classics.* Reading and discussion of some of the great documents of philosophy; Plato's *Republic*, Aristotle's *Nichomachean Ethics*, Descartes' *Meditations*, Kant's *Critique of Pure Reason*, and James' *Essays*, or alternative selections of comparable significance. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

811. *Philosophy in America.* History of philosophic ideas in this country and introduction to its intellectual history; relations of American intellectual currents to their background in the history of philosophy. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

812. *Contemporary Philosophy.* A survey of the philosophical scene in the 20th century: Whitehead's philosophy of organism, the various schools of existentialism, logical positivism, and the current philosophies of language. Consideration of contemporary movements to which these systems have given rise in particular areas of philosophy. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

813. *Philosophy of Man.* The various conceptions of man that are relevant to the con-

temporary American scene: Classical and Scholastic thought, Dialectic thought, Naturalist and Pragmatic thought, Analytic and Positivist thought, and Existentialist and Phenomenological thought. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

814. *Analytic Philosophy.* An introduction to recent analytic philosophy with attention to such topics as semantics and language analysis, the functions of language; modes of meaning; and the relation of linguistic structures to metaphysics. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

815. *Existentialism and Phenomenology.* A study of the background and teachings of existentialism; and an analysis of the methodological principles of phenomenology as seen in the writings of Kierkegaard, Husserl, Heidegger, Jaspers, Sartre, Marcel, and Merleau-Ponty. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

820. *Seminar: Contemporary Philosophical Problems.* Various assigned topics to be discussed by students after adequate research in fields where philosophical problems arise, *e.g.*, the biological, physical, and behavioral sciences, medicine; religion; art; education, etc. Prereq.: Philosophy 600 and eight quarter hours of Upper Division philosophy courses or approval of the department chairman. 1-3 q.h.

821. *Seminar: Areas of Philosophy.* The student will be allowed to consider in depth a particular philosophical interest. The subjects for the seminar will include ethics; logic; aesthetics; value theory; epistemology; metaphysics; language analysis; etc. Prereq.: Philosophy 600 and eight quarter hours of Upper Division philosophy courses or approval of the department chairman. 1-3 q.h.

822. *Selected Topics in Philosophy.* The study of a philosophical problem or philosopher in depth or the relationship of philosophy to problems in another discipline. May be repeated once for a different topic. Total credit in Philosophy 822 cannot exceed six hours. Prereq.: eight hours in Upper Division philosophy. 1-3 q.h.

823. *Philosophy of Justice.* The major classical and contemporary philosophical theories regarding the types of justice and their interrelations, the concepts of legal and moral responsibility, the rationales of reward and punishment, with some attention to the concept of equality. Prereq.: Philosophy 711 or 808 or senior standing in Criminal Justice. 4 q.h.

860. *Mathematical Logic.* Identical with Mathematics 860. 4 q.h.

II. Religious Studies

A major in religious studies is available for the student who desires to prepare for social work, religious education, or related professional activities. It consists of 45 quarter hours including Religious Studies 610, 611, 612, 756, 760 or 762, 765, 831; and Philosophy 712. The remaining hours are to be selected in religious studies, philosophy or related fields by consultation with the department chairman.

Lower Division Courses

501. *Contemporary Religion and Its Backgrounds.* An exposition of Judaism, Roman Catholicism, and Protestantism; their beliefs, rituals, and usuage; their origins and historical developments; and their approaches to the problems of man in modern society. Open to freshmen. 4 q.h.

601. *Introduction to Religion.* An examination of religion giving consideration to: origins, the place of myth, the idea of evil, the idea of God, the use of symbolism, the rise of sacred literature, social, psychological, and ethical importance, the place of rite and ritual, immortality, communion with the deity, and sacrifice. 4 q.h.

607. *Christian Ethics.* A study of the Biblical foundations for Christian decisions in matters of self and society, marriage and family, economic life, racial relations, the state, war, peace, and international order and culture. 4 q.h.

610. *Church History I.* The history of the Christian Church from its origin through Augustine. 4 q.h.

611. *Church History II.* The medieval Church to the Renaissance. 4 q.h.

612. *Church History III.* The modern Church: from the Reformation to the present. The Ecumenical Movement. 4 q.h.

618. *History of Eastern Christian Thought.* An introductory study of the history, theology, polity, worship and morality of the Eastern Orthodox Church. Comparison with corresponding Western Christian thought. 4 q.h.

630. *Introduction to Biblical Literature.* A survey of literature of the Old and New Testaments. The authorship and purposes of the various books, the history of their compilation into the present canon, their structure and

style. The nature of the Bible and the development of religious and ethical ideas. 4 q.h.

Upper Division Courses

740. *The Black Church in America.* A survey of the development of religion among blacks in America from colonial times to the present. Various leaders will be discussed and the importance of the Black Church to the community will be examined. Prereq.: Black Studies 600 or 601, or History 730 or 731, or Religious Studies 612. 4 q.h.

756. *Psychology of Religion.* An introductory review of the more prominent types of personal religious experience, including elementary consideration of conscious and unconscious factors bringing them about. Prereq.: Psychology 601. Identical with Psychology 703. 4 q.h.

757. *The Structure of Religious Experience.* An intermediate examination of religion from the point of view of the experiencing subject, particularly as his experiences are related to the growth and decay of religious institutions. Prereq.: Psychology 601. 4 q.h.

759. *Prophetic Religion.* A social and psychological analysis of the prophetic mentality; the differences between the prophetic approach to religion and that of the priest; an analysis of great prophetic books with a view to the sociological and psychological factors involved; an attempt to delineate the essential elements in prophecy. Prereq.: Junior or senior standing. 4 q.h.

760. *Old Testament Literature.* A critical review of the religious and historical factors involved in the formation of the Old Testament canon. Prereq.: Junior or senior standing. 4 q.h.

761. *Intertestamental Literature.* The Dead Sea Scrolls and other apocryphal literature. Prereq.: Junior or senior standing. 4 q.h.

762. *New Testament Literature.* The development and canonization of Christian literature. Prereq.: Junior or senior standing. 4 q.h.

765. *Primitive and Ancient Religions.* The classic religions of antiquity: a comparative introduction to the history of religion, with reference to the religions of primitive man, and the religious systems of Egypt, Mesopotamia, Persia, Greece, and Rome. Prereq.: Junior or senior standing. 4 q.h.

766. *Living Oriental Religions.* A continuation of Religious Studies 765, historically comparing the religions of China, Japan, India, and the Near East. Prereq.: Junior or senior standing. 4 q.h.

800. *Biblical Times in the Near East.* The economic, political and social condition of Egypt, Syria, Assyria, Babylonia, Canaan, etc., and their relationship to Hebrew history and Biblical development. Emphasis on the period after the Exodus to 70 A.D. Prereq.: One of the following: Religious Studies 760, 761, 765; History 751, 752, 753, 796, 800; Sociology/Anthropology 712, 771, 815. 4 q.h.

830. *Religion in America.* The development of religion in America from the founding in 1607, with attention to the part played by religion in the development of the nation; the development of the religious patterns found in the country, the influence of religion on social and cultural development; and the current interest in religion. The Jewish and Christian religions will be given most of the emphasis in the course. Prereq.: History 605 and 606. 4 q.h.

831. *The Psycho-Social Dynamics of Religion.* An objective examination of religious institutions and practices in relation to the human problems to which they correspond. A comparative appraisal of their effectiveness in meeting the psychic and environmental needs of their adherents. Reasons for their success or failure, in terms of depth psychology, sociology, and anthropology. Present-day religious cults will be examined. Prereq.: One of the following: Religious Studies 756, 757, 765, 766, Psychology 702 or Sociology 602. 4 q.h.

850. *Seminar in Religious Studies.* A seminar to consider in depth one of the following topics: Psychology of Religion; Church History; History of Religions; Biblical Studies; Religion and Modern Society; or a similar topic. Prereq.: Consent of instructor. 1-3 q.h.

851. *Selected Topics in Religion.* The study of a religious problem or movement in-depth, or the relation of religion to some aspect of non-primitive culture. May be repeated once for a different topic. Total credit in Religious Studies 851 cannot exceed six hours. Prereq.: Eight hours of upper division courses in Philosophy or Religious Studies. 1-3 q.h.

PHYSICS AND ASTRONOMY

Professors McLennan and Dalbec; Associate Professors Hanzely (chairman), Bishop, Cochran, Mooney, Moorehead, and Young; Assistant Professors Fisher and Tabak.

Courses are organized with the following aims: (1) to provide well-rounded training in physics and astronomy for those needing it for graduate study, industry, or for secondary school teaching; (2) to provide basic training

for engineering and pre-professional students; (3) to acquaint the non-specializing student with scientific methods and with the place of physics and astronomy in the modern world.

Following the course descriptions below are the curricula and minimum requirements for the degrees of Bachelor of Arts and Bachelor of Science with a major in physics and Bachelor of Science with a combined major in physics and astronomy.

The A.B. degree program in physics is designed for students who are interested in fields which benefit from a strong background in physics or for students planning to terminate their education at the bachelor's degree level. The B.S. degree program in physics is designed for students who plan to pursue graduate studies in physics. The B.S. degree program with a combined physics-astronomy major is designed for students who plan to pursue graduate studies in astronomy or space science.

A student desiring to teach physics or astronomy in secondary schools should consult the Dean of the School of Education.

Lower Division Courses

500A, 500B. *Physics and Man.* A breadth-of-experience approach and largely non-mathematical presentation of selected theories and laws of classical (500A) and modern (500B) physics. These are presented in a historical context of some of the successes and failures of physicists in their efforts to describe our universe in terms of functional relationships. Not applicable to the major in physics or to the combined major in physics and astronomy. Prereq.: None for 500A; 500A or consent of instructor for 500B. 4+4 q.h.

501, 502, 503. *Fundamentals of Physics I, II, III.* A three-quarter sequence consisting of elementary mechanics, sound, heat, electricity and magnetism, and light. Not open to mathematics, chemistry, or physics majors or to engineering students. Prereq.: Mathematics 502 and 503, or equivalent high school algebra and trigonometry. Physics 501 is a prerequisite for 502 and 503. Physics 502 and 503 need not be taken in sequence. 4+3+3 q.h.

502L, 503L. *Fundamentals of Physics Laboratory II, III.* Experimental work designed to supplement the Fundamentals of Physics sequence. Two hours per week. Prereq. or concurrent: 502 for 502L; 503 for 503L. 1 + 1 q.h.

505. *Physics in Science Fiction.* A largely non-mathematical survey of the principles of physics which serve as the background for science fiction literature; two hours of lecture-discussion per week, based on reading assignments from selected works of well-known science fiction authors. Not applicable to the major in physics or to the combined major in physics and astronomy. 2 q.h.

507. *The Physics of Energy.* A basic non-mathematical explanation of the origin, form, uses, and distribution of energy. Topics include electrical energy, mechanical energy, nuclear fission, nuclear fusion, solar energy. This course is designed for the non-science student who is not particularly interested in a broad survey of physics. Not applicable to the major in physics or to the combined major in physics and astronomy. 2 q.h.

509. *Contemporary Physics.* An introductory survey of the current areas of physics research, based primarily on reading assignments from *Scientific American.* Topics will include gravity waves, anti-matter, nuclear structure, the nature of solids, electro-optics, and coherent radiation. 2 q.h.

510. *General Physics I.* A course in mechanics; the kinematics and dynamics of masses in translation; Newton's Laws; the conservation laws of energy and momentum. Prereq. or concurrent: Mathematics 571. 4 q.h.

608. *Sound.* The production of sound by means of vibrating strings, vibrating air columns, and vibrating plates. Simple harmonic motion, and the representation of complex sound waves as a summation of pure sine waves. The principles of reflection, refraction, interference, and resonance applied to sound waves. Sound and hearing. Application of the principles of sound to musical instruments. The reproduction and recording of sound waves with a study of room acoustics. This course is designed for music majors. Not applicable to the major in physics or to the combined major in physics and astronomy. 4 q.h.

610. *General Physics II.* Kinematics and dynamics of masses in rotation; wave phenomena; transmission, reflection, refraction, diffraction, and interference of sound and light. Prereq.: Physics 510. Prereq. or concurrent: Mathematics 572. 4 q.h.

611. *General Physics III.* A study of static electric and magnetic fields; direct current cir-

cuits; induced currents and electromagnetic forces; inductance and capacitance and their transient effects on direct current circuits. Prereq.: Physics 610. Prereq. or concurrent: Mathematics 673. 4 q.h.

610L, 611L.* *General Physics Laboratory II, III.* Experimental work designed to supplement the General Physics sequence. Three hours per week. These laboratories are elective for engineering students. Prereq. or concurrent: 610 for 610L; 611 for 611L. 1 + 1 q.h.

650. *Analytical Physics.* This course is designed for students who have completed Physics 501, 502, 503 and who wish to continue with more advanced courses in physics. It consists of those portions of Physics 510, 610, and 611 which require extensive use of calculus. Prereq.: Completion of the Physics 501, 502, 503 sequence. Prereq. or concurrent: Mathematics 572. 4 q.h.

Upper Division Courses

NOTE: The minimum requirement for all upper division courses in physics and astronomy is either (a) satisfactory completion of Physics 510, 610, 611 (or Physics 650) and Mathematics 674, or (b) consent of the department.

701, 702, 703.* *Intermediate Classical Mechanics I, II, III.* Statistics and dynamics of particles and rigid bodies. Gravitation and the properties of a gravitational field. Principle of virtual work. Motion in accelerated reference frames. Generalized coordinates; Lagrange's and Hamilton's equations of motion. Damped and forced harmonic oscillators. Matrix theory applied to rotary motion of a free body and top and to normal oscillations of a many body system. Prereq.: Physics 611 (or Physics 650) and Mathematics 705. 3 + 3 + 3 q.h.

704,705.* *Introduction to Modern Physics I, II.* Special relativity; quantum effects related to electromagnetic radiation and material particles; selected topics in atomic, nuclear, and solid-state physics. Prereq.: Physics 611 (or Physics 650) and Mathematics 674. 3 + 3 q.h.

705L. *Modern Physics Laboratory.* Experimental work designed to supplement the Physics 704 and 705 lecture courses. Three hours per week. Prereq. or concurrent: Physics 705. 1 q.h.

706. *Electronics Laboratory.* The course is designed to promote a working familiarity with electronic devices and circuits. Analysis of circuits is emphasized rather than their design. Course material includes amplifiers, oscillators, pulse and digital circuits and measurement circuits. One hour lecture and six hours of laboratory a week. Prereq.: Junior standing in Physics Department or consent of instructor. 4 q.h.

710. *Thermodynamics.* An elementary level course in the principles and theorems of thermodynamics which are derived from the observable macroscopic quantities of mass, pressure, volume, and temperature. Prereq.: Physics 611 (or Physics 650) and Mathematics 674. 3 q.h.

710L. *Thermodynamics Laboratory.* Experimental work designed to supplement the corresponding lecture course. Three hours per week. Prereq. or concurrent: Physics 710. 1 q.h.

722. *Physical Optics and Advanced Light.* Interference, diffraction, dispersion, polarization, coherence, molecular scattering and absorption of radiation. Prereq.: Physics 611 (or Physics 650) and Mathematics 674. 4 q.h.

722L. *Physical Optics Laboratory.* Experimental work designed to supplement the corresponding lecture course. Three hours per week. Concurrent: Physics 722. 1 q.h.

730. *Electricity and Magnetism.* Electric and magnetic fields, ohmic and non-ohmic circuit components, direct-and alternating-current circuit theory, transients. Prereq.: Physics 611 (or Physics 650) and Mathematics 705. 3 q.h.

730L, 731L, 732L.* *Electricity and Magnetism Laboratory I, II, III.* Laboratory work in the steady state and transient responses of alternating-current circuits, characteristics and uses of non-linear circuit elements including vacuum tubes and solid state devices. Three hours per week. Concurrent: for Physics 730L, Physics 730. 1 + 1 + 1 q.h.

741, 742.* *Electromagnetic Field Theory I, II.* Electric field and potential, charge distributions, polarization of material media, magnetic field and the vector potential, magnetic moments and magnetic polarization of media, introduction to and application of Maxwell's equations. Prereq.: Physics 730. 3 + 3 q.h.

750. *Mathematical Physics.* The mathematical techniques required in the study of classical, statistical, and quantum mechanics,

*Must be taken in sequence.

*Must be taken in sequence.
†Recommended

and field theory. Prereq.: Physics 611 (or Physics 650) and Mathematics 705. 3 q.h.

805, 806, 807.* *Upper Division Physics Laboratory I, II, III.* An advanced undergraduate physics laboratory, designed to supplement the junior-senior lecture courses required of students majoring in physics. The experiments are selected from the fields of mechanics, heat, optics, electricity and magnetism, atomic physics, and nuclear physics. Six hours of laboratory per week. Prereq.: Physics 702, 705, and senior standing. 2 + 2 + 2 q.h.

810. *Introduction to Quantum Mechanics.* The postulates of wave mechanics, the Schroedinger wave equation, and solutions for elementary problems in quantum theory. Prereq.: Physics 702 and 705; Mathematics 706. 4 q.h.

815. *Kinetic Theory and Statistical Mechanics.* The principles and theorems of thermodynamics which are based upon the statistical treatment of non-observable microscopic quantities, atomic and subatomic particles. Prereq.: Physics 710 and Mathematics 706. 4 q.h.

820. *Advanced Quantum and Quantum Statistical Mechanics.* Quantum-mechanical scattering, angular-momentum coupling schemes, hydrogen molecular ion, Thomas-Fermi and Hartree-Fock models; quantum statistics and applications to the theory of metals, superfluidity and superconductivity. Prereq.: Physics 810 and Physics 815. 4 q.h.

822. *Electrodynamics.* Development of relativistic kinematics from the potential form of Maxwell's equations and of the connection between electrodynamics and quantum concepts. Application of tensor methods to electromagnetic theory with emphasis on physical interpretation. Prereq.: Physics 732 and Mathematics 706. 3 q.h.

826. *Elements of Nuclear Physics.* An introduction to the nucleus and subatomic particles, the deuteron, scattering and absorption, nuclear models, radioactivity, alpha, beta and gamma decay, accelerators, nuclear reactions, and elementary particles. Prereq.: Physics 705 + L and Mathematics 705. 3 q.h.

826L. *Nuclear Physics Laboratory.* Experimental work designed to supplement the corresponding lecture course. Three hours per week. Prereq. or concurrent: Physics 826. 1 q.h.

830. *Elements of Solid State Physics.* Selected topics in Solid State Physics: crystal structure, mechanical thermal, and magnetic properties of solids. Prereq.: Permission of instructor. 4 q.h.

835. *Spectroscopy.* Treatment of atomic and nuclear structure based on the analysis of atomic, molecular, x-ray, gamma-ray, and other spectra. Prereq. or concurrent: Physics 810, or permission of instructor. 4 q.h.

835L. *Spectroscopy Laboratory.* Experimental work designed to supplement the corresponding lecture course. Three hours per week. Prereq. or concurrent: Physics 835. 1 q.h.

850. *Special Topics in Physics.* The study of a standard topic at greater depth, of the development of a correlated background for areas of physical knowledge, or the physical and educational experimentation necessary to develop new physics courses. Prereq.: Consent of instructor and department chairman. 2-5 q.h.

Shown below are suggested curricula for complete four-year programs. Students are urged to come to the department office early in their first year to select, and consult with, an advisor from the teaching staff.

Suggested Curriculums for Majors with a Minor in Mathematics

FIRST YEAR	Hrs.
Physics 510, 610+L, 611+L	14
Mathematics 571, 572, 673	14
Chemistry 515, 516, 517†	12
Electives (See note)	9
	49

SECOND YEAR	Hrs.
Physics 704, 705+L	7
Physics 710+L	4
Mathematics 674	4
Mathematics 705, 706	8
English 550, 551	8
Health and Physical Education 590	3
Health Activity Courses	3
Foreign language or electives (See note)	12
	49

THIRD YEAR	Hrs.
Physics 701, 702, 703	9
Physics 730+L, 731L, 732L	6
Physics 741, 742	6
Physics 750	3
Electives (See note)	21
	45

FOURTH YEAR	Hrs.
Physics 805	2
Physics 810	4
Physics 815	4
Physics Elective	3
Electives (See note)	30
	43

NOTE: The electives must satisfy the general University and/or college requirements, Upper Division credit requirements, and the foreign language requirement of the College of Arts and Sciences. Students majoring in any of the degree programs offered by the department are strongly urged to satisfy the college language requirement in French, German, or Russian.

Minimum requirements for the A.B. degree in physics with a minor in mathematics: Physics courses, 46 q.h.: 510, 610+L, 611-+L, 701, 702, 703, 704, 705+L, 710+L, 730-+L, 731L, 732L, 741, 742. Mathematics courses, 22 q.h.: 571, 572, 673, 674, 705.

Minimum requirements for the B.S. degree in physics with a minor in mathematics: Physics courses, 62 q.h.: same as the A.B. above plus courses 750, 805, 810, 815 plus one 800-level physics elective other than 806 or 807. Mathematics courses, 26 q.h.: same as A.B. above plus course 706.

Minimum requirements for the B.S. degree with a combined major in physics and astronomy and a minor in mathematics: Physics courses, 61 q.h.: same as the A.B. above, plus 15 q.h. from the following physics courses — 722+L, 750, 810, 815, 820, 835-+L. (Students interested in planetary or radio astronomy may substitute courses in geology or electrical engineering for up to 12 of these 15 hours with departmental permission.), astronomy courses, 25 q.h.: 608, 700, 701, 702, 800, 801, 802, 805. Mathematics courses, 26 q.h.: same as for the B.S. degree in physics.

Astronomy

Associate Professors Bishop and Young (supervisor).

Lower Division Courses

504. *Descriptive Astronomy.* Introduction to modern knowledge about the universe; astronomical observing methods; the earth and moon and their place in the universe; planets, stars and star systems, galaxies; recent astronomical discoveries. 4 q.h.

608. *Moon and Planets.* A detailed discussion of the moon and planets, with particular emphasis on the geology of the moon. Prereq.: Astronomy 504 or permission of the instructor. 4 q.h.

Upper Division Courses

700, 701, 702*† *Astrophysics I, II, III.* The application of physical principles to the study of stars and planets; stellar distances and dimensions; stellar spectra and chemical composition; nuclear reactions and evolution of stars; the motion and distribution of stars; the Milky Way and other galaxies; cosmology. Prereq.: Physics 611 (or Physics 650) and Mathematics 674. 3+3+3 q.h.

800, 801, 802.* *Observational Astronomy I, II, III.* Observational techniques in astronomy. Photography, photoelectric photometry, photographic darkroom techniques, spectroscopy, methods of data reduction. Some nighttime observatory work included. Prereq.: Physics 704. 3+3+3 q.h.

805. *Research in Astronomy.* Individual investigation performed with faculty guidance. Prereq.: Astronomy 800, 801 and senior standing. 3 q.h.

NOTE: 700- and 800-level astronomy courses are taught in alternate years with Astronomy 700 offered in the fall of odd-numbered years.

POLITICAL SCIENCE AND SOCIAL SCIENCE

Political Science

Associate Professors Binning (Chairman), Boyer and Esterly; Assistant Professor Buss.

A major in political science consists of 45 quarter hours, with the requirement that the student complete at least six hours in each of the four areas: American government, comparative government, international relations, and political theory.

Related minors in history, economics, geography and sociology are valuable to the political science major preparing for graduate study in political science, or for a career in journalism, law, public administration, or the foreign service. The student who plans to do graduate study in political science or who expects to apply to the foreign service should achieve proficiency in at least one modern foreign language.

Lower Division Courses

600. *Elements of Politics.* An analytic ap-

*Must be taken in sequence.

†Note: These courses may be used to complete a physics minor.

proach to the study of political systems, with illustrations drawn from the American experience. 3 q.h.

601. *American National Government.* A general survey of American political structure and process at the national level, with emphasis on the constitutional order and the electoral system. 4 q.h.

640. *Elements of Comparative Government.* An inquiry into comparative politics, using as case studies the British and Soviet political systems. Prereq.: Political Science 601 or Social Science 503. 4 q.h.

660. *Elements of International Relations.* An introduction to basic principles of international politics, law, and organization. Prereq.: Political Science 601 or Social Science 503. 4 q.h.

Upper Division Courses

700. *American Executive.* An examination of the role of the chief executive officer within the governmental framework. The offices of mayor and governor are treated, but primary emphasis is on critical evaluation of the American presidency. Prereq.: Political Science 601. 3 q.h.

701. *American Legislative Process.* An examination of the lawmaking function. Attention is focused on the United States Congress, with limited consideration of state and local government legislative practices. Prereq.: Political Science 601. 3 q.h.

702. *American Judicial Process.* An examination of the American judicial system, its institutional development and its role in policy determination, as evidenced in leading Supreme Court decisions. Limited attention is given the state judicial systems. Prereq.: Political Science 601. 3 q.h.

703. *American Constitutional Law.* An inquiry into constitutional interpretation by the Supreme Court based on examination of leading cases, with particular attention to questions of federalism, executive power, civil liberties, and economic regulation. Prereq.: Political Science 702. 3 q.h.

704. *American Political Parties.* A descriptive analysis of the role of political parties in a democratic society, with emphasis on development of a theory of party and an examination of the history and characteristics of the American party system. Attention is given a quantitatively structured description of the national electorate. Prereq.: Political Science 601. 3 q.h.

706. *Minority Group Politics.* An analytic examination of the politics of minority groups within American society in terms of organization, behavior, objectives, relative influence and power. The politics of black America will be given particular attention. Prereq.: Political Science 601 or Black Studies 600. 3 q.h.

707. *Interest Group Politics.* An analytic examination of the politics of special interests within American society in terms of organization, behavior, objectives, relative influence and power. Interests concerned primarily with governmental economic policy will be given special attention. Prereq.: Political Science 601. 3 q.h.

712. *Political Behavior.* An empirical examination of politics, with consideration of political leadership as related to influence patterns, public opinion, political role and style. Prereq.: Political Science 600 or 601, or Social Science 503. 3 q.h.

714. *Public Opinion.* A descriptive and quantitative analysis of public opinion in terms of its origin and location, content, interpretation and effects, within the American political system. Included is a practicum in opinion polling, requiring field collection of data, statistical analysis, and evaluative summary. Prereq.: Political Science 600 or 601, or Social Science 503. 4 q.h.

715. *Mass Media and Politics.* An analytic examination of the impact of the mass media on voting behavior and public opinion. Attention will also be given to the political aspects of reporting the news, campaigning and the media, government regulation of the media. Prereq.: Political Science 600 or 601. 4 q.h.

717. *Health Care Policy.* Seminar and field work on the politics of health-policy formation and alternative proposals for the organization of health care delivery, manpower, and finance systems; to include on-site inspections of innovative programs, interviews with administrative and planning personnel. Prereq.: Political Science 601 or admission to NOUCOM-YSU program. 3 q.h.

718. *American Public Policy.* An inquiry into the formulation and implementation of public policy in contemporary American society, with emphasis on the role of government in determining the public interest. Prereq.: Political Science 601. 3 q.h.

719. *Politimetrics.* Practical research experience in measuring the impact on society

*Must be taken in sequence.

of government policies and programs, with emphasis on problem modeling and computer applications. Prereq.: Political Science 600 or 601 and 712 or 714. 3 q.h.

720. *Public Administration.* A study of administrative organizations in American federal and state governments, with special attention to their role in the formulation and implementation of public policy as demonstrated in case studies. Prereq: Political Science 601. 4 q.h.

721. *Urban Government.* An introductory study of the structure and politics of urban government with special attention to intergovernmental relationships. Prereq.: Political Science 601. 3 q.h.

722. *State and Local Government.* A study of the political processes and institutions of state and local governments, with special attention to the federal relationship. Prereq.: Political Science 601. 3 q.h.

729. *Evaluation of Community Health Services.* Identical with Sociology 729. 8 q.h.

741. *Soviet Political System.* A study of governmental and party institutions, ideology, and political behavior in the Soviet Union. Prereq.: Political Science 640. 4 q.h.

742. *Politics and Economics of Developing Areas.* A systematic study of political and economic development in the "underdeveloped areas." Prereq.: Political Science 640. 3 q.h.

744. *European Government and Politics.* A comparative study of governmental institutions and political behavior in France and the Federal Republic of Germany. Prereq.: Political Science 640. 3 q.h.

751. *Government and Politics — Latin America.* Prereq.: Political Science 640. 3 q.h.

752. *Government and Politics — Asia.* Prereq.: Political Science 640. 3 q.h.

760. *International Politics.* A systematic analysis of the principles underlying politics among nations and a study of their application to present international problems. Prereq.: Political Science 660. 4 q.h.

761. *United States Foreign Policy.* A study of the formulation and execution of contemporary United States foreign policy, with attention to its basic principles in the 20th century. Prereq.: Political Science 660. 4 q.h.

762. *Soviet Foreign Policy.* A study of the continuity and change in Soviet foreign policy, with attention to objectives, methods, and the influence of a revolutionary ideology. Prereq.: Political Science 660. 4 q.h.

763. *International Law.* Principles of international law as they have developed through custom and usage, international agreement, and judicial decisions. Prereq.: Political Science 660. 4 q.h.

764. *International Organization.* A study of international organizations (including the United Nations) and regional organizations that foster political integration. Prereq.: Political Science 660, or junior standing and consent of instructor. 4 q.h.

765. *Comparative Foreign Policy.* A study of the factors that shape foreign policy, and a comparison of the foreign policies of selected nation states. Prereq.: Political Science 660. 4 q.h.

766. *Latin American Foreign Affairs.* A systematic study of the inter-American system. Attention will focus on the structure and function of the Organization of American States. Recent U.S. policy toward Latin America will be examined, as will the foreign policies of major Latin American countries. Prereq.: Political Science 751 or consent of instructor. 4 q.h.

767. *Asian Foreign Affairs.* A study of the foreign policies of selected countries of Asia. Prereq.: Political Science 660, 752, or consent of instructor. 4 q.h.

780. *Political Thought I.* Political thought of the Greek period (Plato, Aristotle). Prereq.: Junior standing. 3 q.h.

781. *Political Thought II.* Political thought of the medieval period and transition to modern (Machiavelli and Bodin). Prereq.: Junior standing. 3 q.h.

782. *Political Thought III.* Political thought of the modern period (to Marx). Prereq.: Junior standing. 3 q.h.

783. *Political Thought IV.* Political thought of the modern period (from Marx to the present). Prereq.: Junior standing. 3 q.h.

800. *Select Problems, American Government.* This course may be repeated once. Prereq.: Consent of instructor. 3-6 q.h.

840. *Select Problems, Comparative Government.* This course may be repeated once. Prereq.: Consent of instructor. 3-6 q.h.

860. *Select Problems, International Relations.* This course may be repeated once. Prereq.: Consent of instructor. 3-6 q.h.

880. *Select Problems, Political Thought.* This course may be repeated once. Prereq.: Consent of instructor. 3-6 q.h.

Social Science

Associate Professors Dale and Eichenberger; Assistant Professors Gonzalez and Haushalter, Instructor McKean.

Lower Division Courses

501. *Introduction to the Social Sciences.* A scientific approach to the study of human individual and group behavior. The object is to familiarize the student with the contemporary approach to the various social studies, emphasizing anthropology, psychology, and sociology; to develop critical and analytical skills useful in philosophy; and to accumulate valid knowledge in other fields. (For certification and transfer purposes, this is regarded as a course in introductory sociology.) 3 q.h.

502. *Introduction to Economics.* A continuation of Social Science 501, with emphasis on the allocation of economics resources in response to human needs and wants, and on the institutions through which such allocation is made. (For certification and transfer purposes Social Science 502 is regarded as a course in introductory economics.) Prereq.: Social Science 501. 3 q.h.

503. *Introduction to Political Science.* A continuation of Social Science 502, with emphasis on the application of elementary principles of political science. Attention is given the problems of regulating and controlling human behavior, social control functions of formal and informal groups, controls exerted on the international level by government institutions. (For certification and transfer purposes Social Science 503 is regarded as a course in introductory political science.) Prereq.: Social Science 501. 3 q.h.

Major in Combined Social Studies

The program for the combined major in social studies provides appropriate foundation for the study of law, for graduate work in the disciplines which it includes, and for entry into the civil service field. It can also fulfill requirements for teacher certification in the social sciences.

In addition to the major requirements of Social Science 501, 502, 503 and History 605, 606, the social studies major consists of 63 hours in the disciplines of economics, georgraphy, history, political science, and sociology, to be distributed as follows:

A. A minimum of 18 quarter hours in each of two disciplines;

B. A minimum of eight quarter hours in each of the remaining three disciplines.

A minimum of 27 of the additional 63 hours required must be in Upper Division courses.

The student seeking teacher certification in combined social studies should check the School of Education catalog section on teaching fields.

PRE-FORESTRY
PRE-LAW

Department of Political Science, Advisement.

Pre-law advisement is available at the beginning of the student's college study to acquaint the student with the various fields of legal practice which require specialized undergraduate study, and in the junior year to arrange for law school entrance examinations and interviews.

There are no prescribed majors for the pre-law student. The options of a single discipline major, the American studies major, or the combined major in social studies exist. A maximum of 38 quarter hours of study in an approved law school will be accepted toward completion of the combined social studies major if the last 45 hours prior to these are taken at Youngtown State University. The student is cautioned, however, that the majority of accredited law schools accept only students who have completed the bachelor's degree.

Law school admission standards generally require an undergraduate point average of at least 2.8 and placement above the 60th percentile in the Law School Aptitude Test, which is designed to measure capacity for analytic thought and for precision in the use of language. Regional and national law schools may have more rigorious requirements.

PRE-MEDICAL, PRE-DENTISTRY, PRE-OSTEOPATHY, AND PRE-VETERINARY

See Advisors in the Biological Sciences or Chemistry Departments for details of these programs.

The primary aim of these pre-professional students will be to satisfy entrance requirements for their respective professional schools. These requirements are listed in

bulletins from those schools and should be carefully studied. The American Association of Medical Colleges published a book entitled *Medical School Admission Requirements* which summarizes entrance requirements for medical schools in the United States and Canada. Copies of this book are on reserve in the library and in the Biological Science Department.

Pre-medical students may elect either of the following programs:

(1) a biology major with a chemistry minor

2) a chemistry major with a biology minor

Program (1) or (2) is taken by the majority of students accepted into Medical School. A student may elect any other major and minor if desired, but this is recommended only for students who can maintain extremely high grade averages.

See also *The Northeastern Ohio Universities College of Medicine.*

PSYCHOLOGY

Professors Beckman, S. N. Hotchkiss, and Sweeney; Associate Professors S. M. Hotchkiss, Graf, Letchworth, Masaki, and Morrison (chairman); Assistant Professors Atkinson, Cunningham, Dobrich, Gittis, Guterba, Krause, Krishnan, Small, and Watkins; Instructors Kestner, Quinby.

Psychology offers both the Bachelor of Arts and Bachelor of Science Degrees. The Bachelor of Arts degree may be appropriate for students seeking: (1) a general liberal arts degree; (2) paraprofessional employment; (3) certification with a B.A. degree to teach psychology in the secondary schools; (4) preparation for graduate study in psychology in non-experimental areas.

The Bachelor of Science degree is designed for those students who are interested in pursuing graduate work in experimental, bio-physiological, psychopharmacological or related research areas in psychology; but may be appropriate for other areas.

The requirements for the two degrees are:

	Bachelor of Arts		Bachelor of Science	
Psychology	48		63	
Minor	21	(Not specified)	21	(In natural science, math or engineering)
English	8		8	
H.&P.E.	6		6	
Humanities	16		16	
Social Studies	20[1]		20[1]	
Science/Math (12 in science)	16		9	Hrs. in Math. 550 & Computer Science 600 (or their equivs.) (plus 12 Hrs. in science if minor is engineering)
Foreign Language	8[2]		4[2]	
Electives	62		58	or 46 depending on Minor
	188	Qtr. Hrs.	188	Qtr. Hrs.

[1]At least three credits in departments other than Psychology.

[2]See General University requirements, this catalog for details.

BACHELOR OF ARTS — PSYCHOLOGY — 48 Hours:

A. 560, 613 (Statistical Methods I), 615, 723 (Statistical Methods II);

B. 33 hours in courses designated as applicable to major.

BACHELOR OF SCIENCE — PSYCHOLOGY — 63 Hours:

A. 560, 613 (Statistical Methods I), 615, 723 (Statistical Methods II), 724 (Statistical Methods III), 800 and 828. 27 q.h.

B. Two of the series Psychology 760, 761, 762,765. 8 q.h.

C. Four of the following courses: Psychology 700, 734, 735, 760*, 761*, 762*, 765*, 803, 833, 860. 16 q.h.

D. Three of the following courses: Psychology 702, 709, 712, 716, 740, 755, 756, 757, 770, 790, 802, 820, 841, 845, 850, 870. 12 q.h.

(*)A candidate for the B.S. degree must complete two courses from (B) above but may take additional courses in this series (Psychology 760, 761, 762, 765) which may then be used toward completion of (C) above.

As a major, psychology is primarily an Upper Division program. Prospective majors are advised to concentrate upon the completion of the University and college require-

ments during their freshman and sophomore years.

Students seeking certification to teach psychology in the secondary schools should consult with the School of Education for details regarding certification.

Following each course description is a notation telling when that course will be scheduled during the academic year in the day program. To the fullest extent possible evening program scheduling will be the same. Courses may appear with added frequency by student demand. Courses marked with an asterisk (*) are offered in odd years, and with two asterisks (**) in even years.

502. *Workshop in Applied Psychology.* Study of selected contemporary psychology-related topics requiring no previous exposure to psychological theory. The department will announce the topic and determine the credit as based upon frequency and duration of workshop meetings. May be repeated for a total of eight q.h. with change in topics. Not applicable for the psychology major nor for the Social Science requirement. Prereq.: None. 1-4 q.h.

505. *Personal Adjustment.* Based upon a survey of psychological principles as they relate to the individual student, this course seeks to increase self-awareness, self-acceptance, and satisfying interpersonal relationships. *Not applicable to the psychology majors.* 3 q.h.

520. *Cross-Cultural Patterns of Individual Development.* A comparative study contrasting the effects of different cultural and psychological influences upon the development of the individual and his way of perceiving, understanding, and coping with his environment; comparison of the customs, habits, and social mores of foreign cultures and American sub-cultures as they influence the development of the individual in each. *Not applicable to the psychology major.* 3 q.h.

560. *General Psychology.* An overview of psychology, its major sub-areas, and the activities of psychologists in each; basic principles governing the emergence, organization, and maintenance of behavior patterns. *Required for the psychology major.* (Replaces Psychology 501 and 601. Students who have completed 501 or 601 may not take 560 for credit). 4 q.h.

613. *Statistical Methods in Psychology I.* An introduction to basic methods of handling data including frequency distributions; percentiles; measures of central tendency and dispersion; an understanding of correlation and use of graphic methods. *Required for all psychology majors.* Prereq.: *C* or better in Psychology 560. (F,W) 3 q.h.

615. *Introduction to Experimental Psychology.* The application of scientific methodology to problems in psychology. An introduction to apparatus, methods, and techniques with selected experiments to acquaint the student with basic principles. *Required for the psychology major.* Prereq.: *C* or better in Psychology 560 (601) and 613. (W,Sp) 4 q.h.

620. *Woman: A Psychological Study.* A systematic exploration of the psychology of woman including questions of her social and personality development in terms of institutional, interpersonal and intrapersonal factors. Woman will be surveyed in her many roles such as mother, sexual object, consumer, worker and creator. *Applicable to the psychology major.* Prereq.: Psych. 560 (501 or 601) (F) 3 q.h.

692. *Human Sexuality.* An interdisciplinary approach to the study of human sexuality. Holistic approach dealing with questions that concern the college student of today. Includes problems in sex education, the nature of sexuality, the relationship of sex to personal identity, and sexual mobility. Factual information will be given in the areas of physiological reproduction, contraception, veneral disease, sexual dysfunctions, techniques, and response. Listed also as Biology 692, Health Education 692, and Sociology 692. Prereq.: H.&.P.E. 590. Does not count toward general university requirements. 4 q.h.

Upper Division Courses

700. *Social Psychology.* A survey and consideration of underlying psychological principles that give rise to the concept of self in society; includes such topics as interactions; social-cultural reality; group norms; the crowd; public opinion; and propaganda. *Applicable to the psychology major.* Prereq. Psychology 560 or Sociology 600. (F,W,Sp,Su) 4 q.h.

701. *Introduction to Learning.* A discussion of concepts basic to learning; emphasis on the role of reinforcement and techniques, such as operant conditioning, which utilize it. *Applicable to the psychology major only with permission of the chairman.* Prereq. Psychology 560. (Sp) 3 q.h.

702. *Abnormal Psychology.* An examination of patterns of deviant behavior including current systems of classification; classic syndromes; the nature and trend of major maladjustments; and consideration of possible causative factors and methods of prevention and treatment. *Applicable to the psychology major.* Prereq.: Psychology 560 (F,W,Sp,Su) 4 q.h.

703. *Psychology of Religion.* Identical with Religious Studies 756. *Applicable to the psychology major only with permission of the chairman.* Prereq.: See Religious Studies 756. 4 q.h.

704. *Psychology of Music.* Psychological implications in the composition, performance and appreciation of music. Consideration of tests used to predict music aptitude and musical interest. *Not applicable to the psychology major.* Prereq.: Psychology 560. 3 q.h.

707. *The Psychology of Marriage and Family Relations.* Psychological factors contributing to marital success and family stability; an examination of courtship, marriage, child-and-family relations; sexual relations; and mental hygiene. *Applicable to the psychology major.* Prereq.: Psychology 560. (F,W,Sp,Su) 4 q.h.

708. *Psychology of Mental Health.* The principles of societal and individual behavior which contribute to psychological well-being and adequate self-adjustment. *Not applicable to the psychology major.* Prereq.: Psychology 560 (F) 3 q.h.

709. *Psychology of Education.* Principles of psychology as applied to the educational process including characteristics of the individual learner; the classroom; the instructor; methods and techniques; and other characteristics of the learning process. *Applicable to the psychology major.* Prereq.: Psychology 560. (F,W,Sp,Su) 4 q.h.

712. *Industrial Psychology I.* Principles of psychology applied to the area of business and industry including selection and placement, personnel practices, industrial testing, measurement of performance and training. The role of the psychologist in business and industry. *Applicable to the psychology major.* Prereq.: Psychology 560, 613 and junior standing. (F,Sp) 3 q.h.

716. *Industrial Psychology II.* Principles of psychology applied to the area of business and industry including measurement of attitude and morale; motivation; organization; and social aspects of men and work. *Applicable to the Psychology major.* Prereq.: *C* or better in Psychology 712. (W) 3 q.h.

720. *Workshop in Application of Psychological Theory.* Selected psychosocial problems and the application of psychological principles and theories to their solution. May be repeated for a maximum of 12 hours with different course content. Only four q.h. can be applied to the Social Studies requirement. Four q.h. can be applied to the psychology major without permission of the deaprtment chairman. Prereq.: Psychology 560, Topic and credit hours to be announced. 1-4 q.h.

723. *Statistical Methods in Psychology II.* A review of the basic principles of description statistics including measures of central tendency, variability and correlation followed by an introduction to inferential statistics including z and t tests, Chi Square, and simple analysis of variance. *Required for the psychology major.* Prereq.: *C* or better in Psychology 613. (W,Sp) 4 q.h.

724. *Statistical Methods in Psychology III.* A continuation of inferential statistics including complex analysis of variance and nonparametric statistics; additional study of the special correlational techniques and the concepts of regression and prediction. Introduction to the use of the calculator and computer as aids to statistical computation. Recommended for the student preparing to seek an advanced degree. *Applicable to the psychology major.* Prereq.: *C* or better in Psychology 723. (Sp) (*) 4 q.h.

734. *Applied Behavioral Analysis.* This course extends the results of laboratory findings to human behavior with emphasis on development, maintenance, and extinction of behaviors; institutional, industrial, home and educational settings will be considered. Applicable to the psychology major. Prereq.: Psychology 560 or permission of instructor. (Sp) 4 q.h.

735. *Psychology and Group Dynamics.* A historical survey and review of the group dynamics in psychology starting with the originator, Kurt Lewin, and including a discussion of the major theoretical works, research, and application to the behavior of the individual. *Applicable to the psychology major.* Prereq.: 15 hours of psychology including Psychology 613 and 700. (F) 4 q.h.

740. *Psychological Measurement.* Consideration of basic principles used in the construction of psychological tests, scales, and

questionnaires and their use in vocational and educational guidance. *Applicable to the psychology major.* Prereq.: Psychology 560, 613 or consent of instructor. (W) (**) 4 q.h.

745. *The Minority Individual.* An extensive review of the psychological research on minority membership and its effect upon individual development and behavior. *Applicable to the psychology major.* Prereq.: 15 hours in psychology including Psychology 560, 613 and 700. (Sp.) 4 q.h.

755. *Developmental Psychology I (Child).* A study of human development from conception to puberty. Stresses the interaction between innate, biological factors and experience in shaping behavior. *Applicable to the psychology major.* Listed also as Home Economics 705 (in which the classroom study is supplemented by two hours a week of directed observation of children, for a total of five hours credit). Prereq.: Psychology 560 (705). (F,W,Sp, Su) 4 q.h.

756. *Developmental Psychology II (Adolescence).* A study of human development from puberty to adulthood. *Applicable to the psychology major.* Prereq.: Psychology 560. (706). (F, Sp, Su) 4 q.h.

757. *Developmental Psychology III (Adult).* A study of human development from adulthood through old age. *Applicable to the psychology major.* Prereq.: Psychology 560. (W, Sp) 4 q.h.

760. *Perception.* A consideration of the various theories and experimental evidence concerning how an organism increases its ability to extract information from the environment. *Applicable to the psychology major.* Prereq.: Psychology 615. (F) (*) 4 q.h.

761. *Cognition.* This course explores the experimental methods, research findings, and current theories which attempt to explain the means by which the living organism identifies and gives meaning and understanding to perception (visual, auditory, olfactory, kinesthetic, etc.) and the ways by which the resulting act of cognition differs from the basic act of perception. *Applicable to the psychology major.* Prereq.: Psychology 615. (W) (*) 4 q.h.

762. *Verbal Learning and Memory.* This course provides an overivew of the problems, methods, experimental findings and theories stemming from current and classical research on verbal learning and the retention of that learning in temporary and long-range memory registers. *Applicable to the psychology major.* Prereq.: Psychology 615. (F) (*) 4 q.h.

765. *Experimental Social Psychology.* Examination of problems, principles, methods, and techniques underlying the investigation and development of theories of social psychology, participation in demonstrations, experimentation plus report writing. Will require field and/or laboratory work. *Applicable to the psychology major.* Prereq.: Psychology 615 and 700. (Sp) 4 q.h.

770. *Individual Study.* The individual study of a special problem or a review of the literature relating to a specific psychological problem or issue. A written report is required, one copy of which will remain on file in the department. May be repeated up to six hours. *Applicable to the psychology major.* Prereq.: Consent of the instructor student selects. (F,W,Sp, Su) 1-2 q.h.

780. *Psychological Aspects of Disease and Death.* A survey of the primary factors affecting an individual's attitudes toward illness, bereavement, and mortality; an examination of appropriate counseling methods and of the psychological adjustments necessitated by physical illness or bereavement. *Applicable to the psychology major.* Prereq.: Psychology 560. (F,Su) 3 q.h.

790. *Field Work in Psychology.* Supervised placement with a community agency or organization under direction of a psychologist, social worker, psychiatrist or other mental health or educational professional to attain personal growth with respect to some area of psychology within which the student might plan a career or graduate work and to make classwork more meaningful and relevant. Students will be required to write a paper integrating work experience with background reading, and will be rated by their supervisors *in situ. A maximum of three q.h. may be applied to the psychology major.* One q.h. credit is given for each three hours/week of field work for 10 weeks of the quarter. May be repeated up to six q.h. credit. Prereq.: 12 hours in psychology and permission of instructor. 1-3 q.h.

800. *Psychology of Learning.* A study of the learning process with emphasis on factors such as reinforcement, discrimination, generalization, transfer, etc.; an introduction to modern learning theory. *Applicable to the psychology major.* Prereq.: 20 hours of psychology including Psychology 615. (F) 4 q.h.

802. *Personality.* An investigation of the

variables which determine personality. Normal patterns of behavior are discussed and consideration is given to the more prominent theories of personality. *Applicable to the psychology major.* Prereq.: 20 hours of psychology including Psychology 560. (F,Sp.) 4 q.h.

803. *Comparative Psychology.* A study of animal behavior at various levels of the phylogenetic scale. *Applicable to the psychology major.* Prereq.: 20 hours of psychology including Psychology 560. (Sp) (*) 4 q.h.

805. *Interviewing Techniques.* The basic principles, purposes, and problems of interviewing, including practicum and review. *Applicable to the major.* Prereq.: 20 hours of psychology or consent of instructor. (Sp, Su) 4 q.h.

806. *Vocational Guidance.* Techniques of vocational guidance and their application to high school and college students, vocational rehabilitation, and adults in general. *Applicable to the psychology major.* Prereq.: 20 hours of psychology including Psychology 560 and 740 or consent of instructor. (Sp) 4 q.h.

807. *Introduction to Counseling.* A discussion of the role of the pre-professional in helping the clinical and counseling psychologist; theories of adjustment; area resources; referral; professional problems. *Applicable to the psychology major.* Prereq.: Senior standing plus Psychology 560, 702, and 802 or consent of instructor. (W) 4 q.h.

808. *Psychology of Training & Supervision.* Application of psychological theory and research to the problems of on-the-job training and leadership behavior. Will include such topics as motivation and involvement of employees in organization objectives, individual differences in learning and vigilance, and the supervisor's role in problems of personal adjustment and conflict in the work organization. *Applicable to the psychology major only with permission of chairman.* Prereq.: Senior standing including Psychology 712 or consent of instructor. (Sp) 4 q.h.

812. *Group Testing.* An intensive study of group achievement, intelligence and interest tests plus practice on same. *Applicable to the psychology major.* Prereq.: Senior standing, Psychology 560, 613, and 740 plus consent of instructor. (F) 4 q.h.

815. *Individual Testing: Intelligence.* Intensive study of individual intelligence tests including underlying theories and concepts, with classroom practice in proper administration, scoring, and interpretation. Students will be required to participate in practice and administration of intelligence testing. *Applicable to the psychology major.* Prereq.: Senior standing plus 20 hours in psychology including Psychology 560, 613, 740 and consent of instructor. (F) 4 q.h.

820. *Survey Research.* A study of the concepts and techniques used for the sampling and measurement of attitudes and opinions. *Applicable to the psychology major.* Prereq.: 20 q.h. of psychology including Psychology 560, 700, and 723 or consent of instructor. (F) (*) 4 q.h.

823. *Practicum in Survey Research.* An application of the methods of survey research to field problems. Students will plan an actual survey; design the instrument; select the respondents; conduct the survey; and analyze and interpret the results. *Applicable to the psychology major.* Prereq.; Psychology 820 or consent of instructor. (W) (**) 4 q.h.

828. *Physiological Psychology.* The structure-functional relationships of the various divisions of the neural system; their relationships to the organism as a whole, and their contributions to human behavior. *Applicable to the psychology major.* Prereq.: 20 hours of psychology including Psychology 560 or consent of instructor (W) 4 q.h.

833. *Principles of Operant Behavior.* An introduction to the experimental analysis of behavior from an operant viewpoint, emphasizing simple and complex schedules of reinforcement and stimulus control. *Applicable to the psychology major.* Prereq.: Psychology 615 and 723 or concurrently. (W) 4 q.h.

836. *Psychology of the Exceptional Child: General.* A survey of exceptionality including the orthopedically and physically handicapped, sensorially handicapped, socially and emotionally handicapped, and the intellectually exceptional. *Applicable to the psychology major.* Prereq.: Psychology 755 or 756 and senior standing or consent of instructor. (732) (F) 3 q.h.

837. *Psychology of the Exceptional Child: Retarded.* A detailed investigation of the psychological characteristics of the mentally retarded and the disabled learner. Mental retardation and learning disabilities on borderline, mild and severe levels will be considered. *Applicable to the psychology major.* Prereq.: Psychology 755 or 756 and senior standing or consent of instructor. (W) 3 q.h.

838. *Psychology of the Exceptional Child:*

Gifted. A detailed investigation of the psychological characteristics of the gifted; problems of accommodation and adjustment of the gifted, the creative child. *Applicable to the psychology major.* Prereq.: Psychology 755 or 756 and senior standing or consent of instructor. (Sp) (**) 3 q.h.

841. *History of Psychology.* A brief look at the background for scientific psychology, with major emphasis on trends since the mid-19th century. *Applicable to the psychology major.* Prereq.: 12 q.h. in psychology including Psychology 560. (F) (**) 4 q.h.

845. *Issues in Psychology.* A consideration of issues and controversies in psychology both current and long-standing including a thorough review of ethical standards and obligations of the practitioner and/or teacher of psychology at the sub-professional, mid-professional and full-professional levels. *Applicable to the major.* Prereq.: Senior standing and consent of instructor. (Sp) (**) 3 q.h.

850. *Seminar.* Major topics in psychology not covered in listed courses. Offered each quarter with a different topic. *Applicable to the psychology major to a total of three q.h. but may be repeated twice as elective hours.* Prereq.: Senior major in psychology or consent of instructor 3 q.h.

860. *Motivation.* Classical and contemporary theories of motivation. Elaboration of basic drives into motives; acquisition of new drives and goals; dynamics of the elaborated drive structure; motivation in complex situations. Prereq.: 12 q.h. in psychology and junior standing. 4 q.h.

870. *Environmental Psychology.* A study of the functional relationship between individual behavior and the characteristics and attributes of the physical environment and the relevance of this psychological interaction for environmental planning for the regional, city, neighborhood, and individual habitat. *Applicable to the major.* Prereq.: 20 hours of psychology including Psychology 560, 613, and 700 or consent of instructor. (W) 4 q.h.

RUSSIAN

A major in Russian consists of 45 quarter hours above the elementary level. With the consent of the department chairman, some of these hours may be taken in Russian Area Studies.

Courses in Russian literature (615, 808, 809, and 885 if the topic deals with literature) satisfy the humanities requirement.

Lower Division Courses

See pages 36 and 107 for pre-college and college language requirements.

501, 502, 503. *Elementary Russian I, II, III.* Fundamental principles of grammar taught through oral and written exercises and the reading of simple prose. The stress in this course is on the aural-oral facility. The prerequisite for Russian 502 is Russian 501 or equivalent; the prerequisite for Russian 503 is Russian 502 or equivalent. 4+4+4 q.h.

601. *Intermediate Russian I.* Continuation of inductive grammar. Emphasis on readings in prose and poetry. Oral and written practice based on readings. Prereq.; Russian 503 or equivalent. 4 q.h.

602. *Intermediate Russian II.* A continuation of Russian 601. Prereq.: Russian 601 or equivalent. 4 q.h.

604. *Intermediate Russian Conversation.* Intensive practice in common patterns of speech. Emphasis on construction, control and use of idiomatic expressions. A student may not receive credit for Russian 604 if he has received credit for Russian 763. Prereq.: Russian 602 or equivalent. 4 q.h.

611. *Scientific Russian.* A basic course designed to develop expeditiously an ability to read scientific literature in Russian. Prereq.: Russian 503 or equivalent and one year of a laboratory science. 4 q.h.

615. *Intermediate Russian Reading.* Reading and structural analysis of unsimplified selections from literature, journals, and newspapers. A student may not receive credit for Russian 615 if credit received for Russian 762. Prereq.: Russian 602 or equivalent, 4 q.h.

640. *Selected Topics.* Development of language skills through the study of a topic with practical applications to some area such as business, social studies, cultural trends, etc. May be taken three times for credit if the topic is different. Total credit in Russian 640 may not exceed 8 q.h. A maximum of 4 q.h. may be applied to the major. Prereq.: Russian 602 or equivalent or permission of instructor. 2-4 q.h.

Upper Division Courses

715, 716. *Russian Culture and Civilization I, II.* A survey of ideas expressed in Russian literary, philosophical, aesthetic, social, and political writings and their influence on the

formation of Russian thought and culture. I: From the beginnings to the Imperial Period. II: The Imperial Period to the present. Prereq.: Russian 602 or equivalent, or permission of the instructor. 4+4 q.h.

765. *Practical Russian Phonetics.* Theory and practice of Russian speech, pronunciation, stress, rhythm, and intonation. Phonemic and morphemic analysis. Prereq.: Russian 602 or permission of the instructor. 4 q.h.

770. *Advanced Russian Grammar and Composition.* A review in depth of Russian grammar through exercises, translation, original composition, and analysis of stylistic devices of literary works. Prereq.: Russian 602 or permission of the instructor. 4 q.h.

808. *Russian Literature of the 19th Century.* Reading and interpretation of works by Pushkin, Lermontov, Gogol, Turgenev, Dostoevsky, Tolstoy, Chekhov, and Goncharov. Prereq.: Russian 615 or Russian 716. 4 q.h.

809. *Russian Literature of the 20th Century.* Reading and interpretation of works by Gorky, Blok, Mayakovsky, Fedin, Sholokhov, Fadeyev, Pasternak, and others. Prereq.: Russian 615 or Russian 716. 4 q.h.

885. *Special Topics.* Studies in Russian language, literature or civilization ranging from medieval to modern times. Topic is announced each time course is offered. May be taken three times for credit, if content is not repeated. Prereq.: Russian 715 and/or 716, depending on the topic, or consent of the instructor. 2-4 q.h.

SOCIOLOGY, ANTHROPOLOGY AND SOCIAL WORK

Professors Kiriazis (chairman) and Dobbert; Associate Professors Fry, McDonald, Muntean, and White; Assistant Professors Cooper, DiGiulio, Gartland, Kassees, and Moore; Instructor Shutes.

The Department of Sociology Anthropology, and Social Work offers majors or minors in all three areas, as well as offering a two-year program in social services.

I. Sociology

The concentrations in sociology are useful to the professional study of law, social work, teaching or research, and other allied fields requiring work beyond the bachelor's level.

Employment with a bachelor's degree is limited to such areas as high school teaching, some welfare services such as public assistance and child welfare, or some social services in public administration, social security and its allied programs, recreation and health services.

A major in sociology consists of 45 quarter hours. Majors must take Social Statistics 701, Social Research 751, and History of Social Theory 760. The remaining hours are to be selected in sociology, anthropology or social work.

Lower Division Courses

500. *Fundamentals of Sociology.* An introduction to the principles of the science of human societies and groups. The structures, functions and processes bringing about changes in societies, groups, communities, classes, and institutions will be analyzed. 4 q.h.

600. *Principles of Sociology.* A continuation of Sociology 500 with greater emphasis on illustrative material and problem areas. Consideration will be given to the major social institutions. Prereq.: Soc.-Anth. 500. 4 q.h.

601. *Social Problems.* A sociological overview of various contemporary social issues, analyzing significant discrepancies between social standards of expectations and actual social behavior. An attempt will be made to ascertain possible causes, discuss trends, and alternative organizational and possible institutional changes. 4 q.h.

630. *Criminology.* Study of the social context of crime in American society including a review of historical theories offered in explanation of criminal behavior. Cross-listed with Criminal Justice 630. 4 q.h.

Upper Division Courses

700. *Minority Groups.* A survey of the origin and characteristics of ethnic and racial minority groups, with emphasis on the significance of membership in such a group for in-group, out-group, and community solidarity. Prereq.: Soc.-Anth. 500. 5 q.h.

701. *Social Statistics I.* Measurement and interpretation of social data by the use of descriptive techniques. Prereq.: Soc.-Anth. 500 or 602. Cross-listed with Criminal Justice 710. 4 q.h.

702. *Social Statistics II.* Continuation of Sociology 701. The methods of probability theory as a basis for statistical inference, hypothesis testing, correlation, chi-square and variance analysis. Prereq.: Soc-Anth. 701. Cross-listed with Criminal Justice 711. 4 q.h.

703. *Sociology of Aging.* Characteristics of aging, problems for the individual and his family as well as society at large; some basic skills needed for providing services to and for the aged. Prereq.: Soc.-Anth. 500. 4 q.h.

705. *The Family.* Family and kinship systems as a major institution; their development, functions, and relation to other basic institutions as found in different cultures and social strata. Prereq.: Soc.-Anth. 500 or 602. 4 q.h.

706. *Industrial Sociology.* The study of industrial social organizations and change processes which have developed in modern urban societies, with special emphasis on American society. Attention will be given to the repercussions of technological change on groups in society, using a comparative point of view. Prereq.: Soc.-Anth. 600. 4 q.h.

707. *Urban Sociology.* A comparative study of cities of pre-industrial and industrial societies, historical and contemporary. Special emphasis will be placed upon the process of urbanization and changing urban structure and functions. Prereq.: Soc.-Anth. 600. 5 q.h.

708. *Political Sociology.* An analysis of the social conditions that affect government and politics and which may help to determine political order and regulate struggles for power. There is a focus on associations and movements leading to stability or change in a society. Prereq.: Soc.-Anth. 600. 4 q.h.

709. *Social Control.* Means of control in primitive and advanced societies. The role of the family, school, church, clubs, economic institutions, the press, radio, television, and movies. The modification of individual and group behavior by group valuations, praise, ridicule, rewards, punishments, symbols, slogans, and propaganda. Prereq.: Soc.-Anth. 500. 4 q.h.

729. *Evaluation of Community Health Services.* An analysis of contemporary American health care delivery. Each subsystem is considered with respect to its organization, social function, objectives, financing, legal responsibilities, and interactions with other subsystems; these include medical manpower; hospitals and residential care facilities; federal, state, and local health agencies; epidemiology and pathology as it relates to human variation; physiological adaptations and environmental factors; spatial organization, and distance as factors in planning and meeting needs; consumer behavior and inventives in health care. An interdisciplinary course with field observation taught jointly by and cross-listed in the departments of Economics, Geography, Political Science and Sociology/Anthropology; two quarter hours may be counted toward a major, and two toward a minor in any other subjects. Prereq.: Admission to NOUCOM-YSU or Sociology 719 and 745 and Political Science 717, or equivalent. Cross-listed in Economics. Geography and Political Science. 8 q.h.

735. *Juvenile Delinquency.* Social and psychological factors underlying delinquency; the juvenile court and probation; treatment and preventive measures. Prereq.: Soc.-Anth. 600. Cross-listed with Criminal Justice 735. 4 q.h.

740. *Complex Organization.* A survey of theory and research on structures and processes of large-scale organizations; leaderships, control techniques, tensions, bureaucratic pathologies and organizational change. Consideration of industrial-commercial, governmental, religious, military, and educational organizations. Prereq.: Soc.-Anth. 600. 5 q.h.

741. *Social Movements.* An analysis of the role of social movements, intellectual criticism, and socio-economic trends; study of the dynamics of change initiated outside of regular and institutionalized channels, including mobs and crowds. Prereq.: Soc.-Anth. 600. 4 q.h.

742. *Small Group Processes.* A study of small group behavior; influence, attitudes, and values of social microsystems. Prereq.: Soc.-Anth. 600. 4 q.h.

743. *Social Stratification.* A comparative analysis of social stratification systems with a major emphasis on modern Western societies. Prereq.: Soc.-Anth. 600. 4 q.h.

744. *Social Deviance.* A survey of the problems of drug abuse, sexual deviation, crime, and other forms of deviance. Emphasis on various approaches or perspectives to deviant behavior formulated in sociological theory; the study of etiologies and of the methods of social control. Prereq.: Soc.-Anth. 600. 4 q.h.

745. *Medical Sociology.* Social attitudes towards illness. A study of cultural and social factors in disease processes, distribution of diseases, social definition of illness, and organization of the health professions and health facilities. Lectures and field work. Prereq.: Soc.-Anth. 500, or admission to the NOUCOM-YSU program. 3 q.h.

751. *Social Research.* Seminar in methods of obtaining, interpreting, and presenting sociological data. Each student makes an intensive study of an existing situation. Prereq.: Soc.-Anth. 600 or 602. 5 q.h.

755. *Theories of Gerontology.* A review and critical analysis of the current theories of social aspects of aging, and their use in research. Prereq.: Soc.-Anth. 600. 4 q.h.

756. *Aging and Ethnicity.* A comparative study of aging in various America subcultures, demonstrating the differences in status/role systems, demographic distributions, and life styles. Includes methods of dealing with the aged, and related problems. Prereq.: Soc.-Anth. 600. 4 q.h.

757. *Gerontology: Retirement.* The exploration and critical examination of social attitudes toward the process of aging and retirement; to develop an awareness of the need of and avenues for the provision of later life resources. Prereq.: Soc-Anth. 600. 4 q.h.

758. *Industrial Gerontology.* Social aspects of the work-occupational system of the aged as it relates to ultilization of manpower, and the social distribution of resources, both public and private, support programs, and the resultant social conditions. Prereq.: Soc.-Anth. 600. 3 q.h.

760. *History of Social Theory.* The historical development of social theory out of social philosophy with an emphasis on the scientific schools of thought of the 19th and early 20th centuries. Prereq.: Soc.-Anth. 600 or 602. 5 q.h.

761. *Modern Sociological Theory.* An analysis of key schools of sociological theory of the present. Prereq.: Soc.-Anth. 600 or 602. 4 q.h.

774. *Comparative Community Studies.* A comparative study of peasant society as a social type contrasted with primitive and industrial society; the impact of contact, problems of modernization, stability and conflict in developing cultures. Prereq.: Soc.-Anth. 600 or 602. 5 q.h.

787. *Population Movements.* Trends in world population in their relation to history, migration, and urbanization. Human demography and ecology: various measurements of the size, density, and distribution of population as well as their economic and social environments. Listed also as History 787. Prereq.: Junior standing. 4 q.h.

789. *Man and the Technological Society.* An interdisciplinary critical examination of man in the modern technological society from the perspectives of engineering, life, and social science. The topics will be (1) history of technology, (2) the world's available energy and material resources, (3) population dynamics as they interact with nature and the human ecosystem, such as "the green revolution," cybernation, value concepts, and techniques to forecast societal changes. Listed also as Chemical Engineering 789 and Biology 789. Prereq: Junior standing or consensus of instructors. 4 q.h.

898. *Select Problems in Sociology and Anthropology.* Senior readings in sociology and anthropology dealing with selected current problems in theory and methods. Variable credit is given according to the nature and extensiveness of the problems and literature to be consulted. Intended for students planning to enter graduate school. Prereq.: Departmental major in senior year. 1-5 q.h.

II. Anthropology

A major in anthropology consists of 45 quarter hours. Majors must take Social Statistics 701, Social Research 751, History of Anthropological Thought 801, courses in cultural anthropology, archaeology, and physical anthropology, and two area courses. The remaining hours are to be selected in sociology, anthropology, or social work.

Lower Division Course

602. *Anthropology: An introduction.* An explanation of the past and present horizons of anthropology. Specific attention is given to the emergence of man; prehistory and human social and cultural systems. 4 q.h.

Upper Division Courses

711. *Cultural Anthropology.* A cross-cultural comparison of the cultural norms that regulate society. Emphasis is placed on the functional prerequisites for the existence of society and individual demands on society. Prereq.: Soc.-Anth. 602. 4 q.h.

712. *Archaeology.* An introduction to the methods and subject matter of archaeology as it reconstructs paleolithic and prehistoric cultures as inferred from artifacts. Prereq.: Soc.-Anth. 602. 4 q.h.

713. *Social Anthropology.* The origin, diffusion, and continuity of primitive social institutions with their relation to contemporary social phenomena. Prereq.: Soc.-Anth. 602. 3 q.h.

714. *Physical Anthropology I: Human*

Evolution. The physical origins and development of the human species as a member of the primate order and the biological bases of human behavior disclosed by human paleontology and archaeology. Prereq.: Soc.-Anth. 602. 4 q.h.

715. *Physical Anthropology II: Human Variation.* The distribution of man into variant physical types and the casual adaptations of these varieties in relation to evolutionary human ecology. Prereq.: Soc.-Anth. 602. 4 q.h.

716. *Anthropology: Maya, Aztec, and Inca Cultures.* The origins, cultures, and achievements of the classic civilizations of the New World: Aztec, Inca, and Maya. Prereq.: Soc.-Anth. 602. 4 q.h.

750. *Language and Culture.* Identical with Linguistics 750. 4 q.h.

752. *Anthropology: Historical Linguistics.* A survey of the theory and techniques of comparative linguistics with an emphasis on the establishment of genetic relationships, procedures for sub-grouping, internal reconstruction, and glottochronology. Prereq.: Soc.-Anth. 602 or 750. Listed also as Linguistics 752. 4 q.h.

753. *Anthropoligical Linguistics.* An introduction to elementary linguistic theory from an anthropological viewpoint with practical work in phonetics, phology morphology, syntax, and transformational grammar. Prereq.: Soc.-Anth. 602 or 750. Listed also as Linguistics 753. 4 q.h.

770. *African Cultures.* An anthropological analysis of contemporary cultures in Africa. Prereq.: Soc.-Anth. 602. 4 q.h.

771. *Middle Eastern Cultures.* An anthropological analysis of contemporary cultures found in the Middle East. Prereq.: Soc.-Anth. 602. 4 q.h.

772. *Asian Cultures.* An anthropological analysis of ancient and contemporary cultures in Asia. Prereq.: Soc.-Anth. 602. 4 q.h.

773. *Australian and Oceanic Cultures.* An anthropological analysis of ancient and contemporary cultures found in Australia and Oceania. Prereq.: Soc.-Anth. 602. 4 q.h.

775. *North American Indians.* The culture and achievements of the North American Indians. Prereq.: Soc.-Anth. 602. 4 q.h.

776. *South American Indians. The culture and achievements of the South American Indians. Prereq.: Soc.-Anth. 602.* 4 q.h.

777. *Method and Theory in Archaeology.* A survey of past and contemporary theory and methodology in archaeology with an emphasis on recent innovations in the U.S. and Europe. Prereq.: Soc.-Anth. 712. 4 q.h.

778. *Archaeological Techniques.* An introduction to archaeological field methods including surveying, mapping, excavation, and artifact analysis: 220 hours per quarter. Prereq.: Soc.-Anth. 712. 6 q.h.

779. *Primate Ethology.* Survey of the behavioral patterns of contemporary living primates emphasizing the relationships with the behavior patterns of early and modern man. Prereq.: Soc.-Anth. 602. 4 q.h.

780. *Human Paleontology.* A detailed survey of the fossil evidence for human evolution including techniques of measurement and decription of human skeletal remains. Prereq.: Soc.-Anth. 602. 4 q.h.

781. *Archaeological Laboratory Techniques.* Site reconnaissance, artifact analysis and preservation, microwear analysis, analysis of faunal remains, coprolite analysis, archaeological report writing, etc. Some field work may be required. Prereq.: Soc.-Anth. 712 or Permission of Instructor. 4 q.h.

801. *History of Anthropological Thought.* An analysis of the anthropological theories and methodology of the major contributors to contemporary anthropological thought, such as the evolutionist, diffusionist, functional, and multi-linear school. Prereq.: Soc.-Anth. 600 or 602. 4 q.h.

815. *Anthropology: Primitive Religion.* A survey of anthropological approaches to the study of religion, illustrated by a critical consideration of past and present contributions to the field. Included will be a study of selected religious systems, areally and topically. Prereq.: Soc.-Anth. 602. 4 q.h.

820. *Anthropology: African Prehistory.* A survey of the prehistoric development of African cultures south of the Sahara. Prereq.: Soc.-Anth. 712. 4 q.h.

821. *Anthropology: Near Eastern Prehistory.* A survey of the prehistoric and early historic development of Near Eastern cultures with an emphasis on the rise and spread of plant and animal domestication and civilization. Prereq.: Soc.-Anth. 712. 4 q.h.

822. *Anthropology: North American Prehistory.* A survey of the prehistoric development of North American Indian cultures from the Arctic to Northern Mexico. Prereq.: Soc.-Anth. 712. 4 q.h.

823. *Anthropology: European Prehistory.* A survey of the prehistory of Europe from the Lower Palaeolithic through the Iron Age. Prereq.: Soc.-Anth. 712. 4 q.h.

III. Social Work

A major in social work consists of 50 quarter hours. Majors must take Social Statistics 701, Social Research 751, and History of Social Theory 760 (or Social Work Theory and Practice 732), as well as Social Work 620, 621, 722, 725 (twice), and 734 (twice). The remaining hours are to be selected in sociology, anthropology, or social work.

Social Services Technology. A two-year degree in social services technology leads to the degree Associate in Applied Science degree through the College of Applied Science and Technology.

Lower Division Courses

520. *Workshop in Applied Social Work.* Study of selected contemporary social work topics. The department will announce the topic and determine the credit as based on frequency of meetings. May be repeated for a total of eight q.h. with change in topics. Not applicable for the Social Work major nor for the Social Studies requirement. Prereq.: None.

1-4 q.h.

620. *Introduction to Social Work.* A general overview of the development, philosophy, and values of the profession of social work from a historical viewpoint with emphasis on current roles, interventions, trends, and issues. Representatives from various social-work settings will serve as guest lectures. Prereq.: Soc./Anth. 500. 4 q.h.

621. *Human Development and Social Environment.* Relationship between present-day American social structure and cultural patterns in the development of personality throughout the life process. Prereq.: Soc.-Anth. 500 4 q.h.

622. *Helping Relationships.* The basic principles of helping people in human service settings. Preparation of students for helping roles as volunteers, observers, and aides in social work agencies. Knowledge of oneself as an individual and in relation to others. Prereq.: Soc.-Anth. 500. 3 q.h.

692. *Human Sexuality.* An interdisciplinary approach to the study of human sexuality. Holistic approach dealing with questions that concern the college student of today. Includes problems in sex education, the nature of sexuality, the relationship of sex to personal identity, and sexual mobility. Factual information will be given in the areas of physiological reproduction, contraception, venereal disease, sexual dysfunctions, techniques, and response. Listed also as Biology 692, Health Education 692, and Psychology 692. Prereq.: H & PE 590. Does not count toward General University Requirements. 4 q.h.

Upper Division Courses

719. *Health Care Systems.* A sociological analysis of the role of the physican, the nurse, the social worker, and paramedical personnel in a variety of settings including private practice, the hospital, and public agencies. Some attention to federal programs as related to local systems. Lectures and field work. Prereq.: Soc.-Anth. 620, or admission to the NOUCOM-YSU program. 3 q.h.

721. *Social Policy.* A survey of the programs, organizations, and functions of social services, and the effects of government policies upon the administration of these services. May include visits to local agencies. Prereq.: Soc.-Anth. 620. 4 q.h.

722. *Social Casework Methods.* Analysis of the major social casework processes consisting of study, assessment and treatment from both theoretical and case-study perspectives. Role-playing and case discussion will be used to develop beginning casework skills. Prereq.: Soc.Anth. 621 or admission to NOUCOM-YSU program. 3 q.h.

723. *Social Group Work Methods.* Analysis of the major processes employed in social group work; relation of social group work methods to other fields, such as teaching, recreational leadership committee work, and participation in civic and community affairs. Prereq.: Soc.-Anth. 620. 3 q.h.

724. *Community Organization Methods.* Analysis of the major processes employed in community organization and social action for the purpose of achieving a more effective adjustment between social service needs and community resources; relation of community organization methods to areas other than social work, such as civic leadership, industrial planning, political and legal services. Prereq.: Soc.-Anth. 620. 3 q.h.

725. *Field Work in Social Services.* Supervised practice in approved social agencies under the direction of professional social workers, designed to give the student controlled educational experience in social work. The student is required to spend 15 hours

weekly in the agency for each six hours credit. May be repeated for a maximum of 12 quarter hours. Concurrent: Soc.-Anth. 734. Prereq.: 20 q.h. in social work. 6-12 q.h.

726. *The Black Family.* A sociological study of the Black Family. Consideration will be given to the origins of the Black Family in the Americas and the factors pertaining to class, economics, politics, religion, education and law that have affected the pattern of functional and social behavior of the Black Family. Prereq.: Black Studies 600 or Soc.-Anth. 500. 4 q.h.

727. *Black Community.* The Black community will be viewed as part of the larger social system, but which has a uniqueness growing out of the Black Experience in American society. Population, cultural forms and institutional structures will be explored in terms of their uniqueness and in relationship to their social and physical survival functions. An analysis will be made of how the dominant social system restricts or facilitates the self-determination of the Black community. Prereq.: Black Studies 600 or Soc.-Anth. 500. 4 q.h.

728. *Social Services for Children.* Social welfare agencies and services developed by communities for the care and training of children. Development of a conceptual framework for understanding the issues, problems, and policies in children's services. Prereq.: Soc.-Anth. 620 4 q.h.

730. *Social Services and the Aged.* An empirical and analytical base for understanding the policies, problems, and trends in services for the aged. Prereq.: Soc.-Anth. 620. 3 q.h.

731. *Social Services and the Handicapped.* Problems arising from or related to illness and disability; adjustment of handicapped persons. Application of general interventive techniques of working with the handicapped. Exposure to recent research and treatment innovations. Prereq.: Soc.-Anth. 620. 3 q.h.

732. *Social Work Theory and Practice.* Strategies of intervention in problem-solving. Social work concepts and their application to advanced methods in working with client groups. Research relevant to clinical practice and current trends in theory will be analyzed. Prereq.: Soc.-Anth. 620. 4 q.h.

734. *Field Work Seminar.* Provides integration in learning experiences of social work student involved in field work. Coordination between theoretical content and its application to social service assignments in the field. May be repeated once for the baccalaureate degree. Concurrent: Soc.-Anth. 725. 2 q.h.

737. *Social Work Interventions with Family.* Basic theoretical approaches to social work with family members individually, conjointly, and in family groups, using a case-study approach. Study of social service problems of social adjustment seen within various types of social agencies. Prereq.: Soc.-Anth. 722. 4 q.h.

SPANISH

A major in Spanish consists of 45 quarter hours above the elementary level, including Spanish 705, 706, and 717.

Courses in Spanish literature (615, 705, 706, 717, 729, 805, 806, 816, 825, 826, 828, 835, 836, and 885 if the topic deals with literature) satisfy the humanities requirement.

Lower Division Courses

See Pages 36 and 107 for pre-college and college language requirements. Any two 601-level two quarter hour courses (601A, 601B, 601C, 601D, or 601Y) may be taken instead of the 4 q.h. 601; any two 602-level two quarter hour courses (602A, 602B, 602C, 602D, or 602Y) may be taken instead of the 4 q.h. 602.

500A, 500B, 500C. *Elementary Spanish I, II, III.* A competency-based course, identical in content to Spanish 501, 502, 503. Each segment is divided into four units, each unit equivalent to one credit. Each student signs up for the number of credits he feels he can complete each quarter. A total of four credits can be accumulated in each segment. Prereq. or concurrent: for 500B: 500A or 501 or equivalent; for 500C: 500B or 502 or equivalent, or 500A and 500B. 1-4 + 1-4 + 1-4 q.h.

501, 502, 503. *Elementary Spanish I, II, III.* Fundamental principles of grammar taught through oral and written exercises and the reading of simple prose. The stress in this course is on the aural-oral facility. The prerequisite for Spanish 502 is Spanish 501 or equivalent; the prerequisite for Spanish 503 is Spanish 502 or equivalent. 4+4+4 q.h.

601. *Intermediate Spanish I.* Review of grammar through oral and written exercises. Reading of modern prose and poetry. Prereq.: Spanish 503 or equivalent. 4 q.h.

601A. *Grammar.* Practice of Spanish construction through oral and written exercises.

Prereq.: Spanish 503 or equivalent. 2 q.h.

601B. *Beginning Conversation.* Oral practice to develop vocabulary and frequently used idiomatic expressions. Prereq.: Spanish 503 or equivalent. 2 q.h.

601C. *Reading for Comprehension.* Selected readings in a variety of topics to develop the skill of comprehension and to increase passive vocabularly. Prereq.: Spanish 503 or equivalent. 2 q.h.

601D. *Elements of Writing.* Spanish vocabulary building and development of individual expression. Prereq.: Spanish 503 or equivalent. 2 q.h.

601Y. *Intermediate Special Topics I.* Material in Spanish at the 601-level in some specialized area not covered in the other two q.h. courses. May be taken three times for credit if content is not repeated. Prereq.: Spanish 503 or equivalent. 2 q.h.

602. *Intermediate Spanish II.* Continuation of Spanish 601. Prereq.: Spanish 601 or any two different Spanish 601 two q.h. courses, or equivalent. 4 q.h.

602A. *Business Spanish.* An introduction to the specific field of commercial Spanish (recommended for business and secretarial students). Prereq.: Spanish 601 or any two different Spanish 601 two q.h. courses, or equivalent. 2 q.h.

602B. *Introduction to Hispanic Culture.* Selected readings to acquaint the student with the basic characteristics of Spanish-speaking peoples. Prereq.: Spanish 601 or any two different Spanish 601 two q.h. courses, or equivalent. 2 q.h.

602C. *Readings in Hispanic Literature.* Selections from Spanish and/or Spanish-American authors read for content. Prereq.: Spanish 601 or any two different Spanish 601 two q.h. courses, or equivalent. 2 q.h.

602D. *Practical Spanish.* Development of comprehension and expression in Spanish pertinent to professional practice and work (recommended for students interested in nursing, social work, teaching, and other community service). Prereq.: Spanish 601 or any two different Spanish 601 two q.h. courses, or equivalent. 2 q.h.

Spanish

602Y. *Intermediate Special Topics II.* Material in Spanish at the 602-level in some specialized area not covered in the other 2-q.h.-courses. May be taken three times for credit if content is not repeated. Prereq.: Spanish 601 or any two different Spanish 601 two q.h. courses, or equivalent. 2 q.h.

615. *Intermediate Spanish Readings.* An introductory course on the reading of literary texts for their linguistic, stylistic, and literary aspects. Prereq.: Spanish 602 or equivalent. 4 q.h.

640. *Selected Topics.* Development of language skills through the study of a topic with practical applications to some area such as business, social studies, cultural trends, etc. May be taken three times for credit if the topic is different. Total credit in Spanish 640 may not exceed 8 q.h. A maximum of 4 q.h. may be applied to the major. Prereq.: Spanish 602 or equivalent or permission of instructor. 2-4 q.h.

655. *Conversational Spanish.* A course in oral Spanish, with the instructor using the direct conversational approach to help the student speak the language fluently. Topics leading to the use of Spanish in practical everyday situations. Prereq.: Spanish 602 or permission of the instructor. 4 q.h.

Upper Division Courses

705, 706. *Survey of Spanish Literature.* An introduction to the study of Spanish literature, aimed at acquainting the student with the main works, writers, and the principal literary tendencies and movements. First quarter: From the beginnings to 1700. Second quarter: From 1700 to the present. Prereq.: Spanish 615 or permission of the instructor. 4+5 q.h.

717. *Survey of Spanish-American Literature.* An introduction to the study of Spanish-American literature aimed at acquainting the student with the main works, writers, and principal literary tendencies and movements. Prereq.: Spanish 615 or permission of the instructor. 5 q.h.

725, 726. *Review of Spanish Grammar and Composition.* A review of Spanish grammar through analysis of stylistic devices of literary works and through exercises, translation, and original composition. Prereq.: Spanish 602 or equivalent. 4+4 q.h.

729. *Explicacion de Textos.* Detailed examination of poetry and prose to develop skill in perceptive analysis of literature. Prereq.: Spanish 615 or permission of the instructor. 4 q.h.

750. *Spanish Civilization.* A survey of

Spanish culture: the ideas, attitudes, and values definitive of the Spanish character. Includes class discussion for improvement of oral facility. Prereq.: Spanish 602. 4 q.h.

751. *Latin American Civilization.* A survey of Latin American culture: the ideas, attitudes, and values definitive of the Latin American character. Includes class discussion for improvement of oral facility. Prereq.: Spanish 602. 4 q.h.

805. *The Prose of the Golden Age.* A special concentration on *Don Quixote* with general reference to other prose genres of the epoch. Prereq.: Spanish 705 or consent of the instructor. 4 q.h.

806. *The Drama of the Golden Age.* A study of the drama with special emphasis on Lope de Vega. Tirso de Molina, Calderon, Alarcon. Prereq.: Spanish 705 or consent of the instructor. 4 q.h.

816. *Ninteenth Century Spanish Prose.* Study of fiction in Spain during the 19th century. Special emphasis on the renaissance of the novel. Prereq.: Spanish 706 or consent of the instructor. 4 q.h.

825. *Twentieth Century Spanish Prose.* Study of post-modernist and contemporary Spanish prose writers. Prereq.: Spanish 706 or consent of the instructor. 4 q.h.

826. *Twentieth Century Spanish Drama.* The dramatic production in Spain starting with Benavente. Prereq.: Spanish 706 or consent of the instructor. 4 q.h.

828. *Hispanic Poetry.* The study of the poetry of Spain and Spanish-America from the Renaissance of the present. Prereq.: Spanish 705 or 717 or consent of the instructor. 4 q.h.

835. *Modern Spanish-American Prose.* Literary prose in Spanish-America from the middle of the 19th century to the present. Prereq.: Spanish 717 or consent of the instructor. 4 q.h.

836. *Modern Spanish-American Drama.* Study of the 20th century dramatists. Prereq.: Spanish 717 or consent of the instructor. 4 q.h.

850. *Problems in Spanish Syntax and Usage.* A course designed mainly for prospective teachers of Spanish, dealing with the more advanced problems of Spanish grammar and usage. Prereq.: Spanish 725 and 726. 4 q.h.

885. *Special Topics.* Studies in Spanish language, literature, or civilization ranging from medieval to modern times. Topic is announced each time course is offered. May be taken three times for credit, if content is not repeated. Prereq.: Spanish 705 and/or 706 and/or 717, depending on the topic, or consent of the instructor. 2-4 q.h.

UNIVERSITY HONORS SEMINAR

701, 702, 703. *The University Honors Seminar.* A critical investigation of certain ideas underlying civilization, embracing and integrating the particular studies of science, society, and the humanities. The seminar is conducted by two instructors and occasional special lecturers. Meetings are symposia in which individual papers are presented and criticized. Students completing the seminar with distinction are granted special honors by the University. Departmental chairmen will determine what credit can be applied toward the student's major. Limited to students selected by the faculty members participating in the program. 3+3+3 q.h.

ZOOLOGY

See *Biolgical Sciences.*

School of Business Administration

Robert L. Miller, Dean

ORGANIZATION AND DEGREES

The School of Business Administration has four departments: Accounting and Finance, Advertising and Public Relations, Management, and Marketing.

Majors are offered in accounting, advertising and public relations, advertising art, finance, general administration, industrial management, management, fashion or industrial or retail marketing, marketing management, public administration, transportation management, and secretarial studies. Minors are offered in accounting, advertising, finance, management (except when the majors are general administration, industrial management, public administration, or transportation management), and marketing.

The degrees to which courses in the fields may lead are those of Bachelor of Science in Business Administration, the requirements for which are listed below, and the Bachelor of Science in Education with a major in business education, for which see the School of Education. A two-year curriculum leading to the Associate in Applied Business degree through the College of Applied Science and Technology is also offered in most of the above areas of study. See the College of Applied Science and Technology section.

REQUIREMENTS FOR THE DEGREE

Bachelor of Science in Business Administration

It is the student's responsibility to see that all the graduation requirements for the degree sought are satisfied. For the Bachelor of Science in Business Administration degree, these are:

1. The pre-college or preparatory courses, normally taken in high school. These are listed briefly below; for further information see the General Requirements and Regulations section.

2. The courses and other requirements to be completed in the University. They are explained in the General Requirements and Regulations section but are recapitulated below.

The curriculums leading to the degree require a minimum of 186 quarter hours of credit for advertising and public relations, management, fashion marketing, industrial marketing, marketing management, or retail marketing and 194 hours for accounting, advertising art, finance, general administration, industrial management, public administration, transportation management, and secretarial studies, and are designed to be completed in four academic years. A student willing and able to carry heavier loads successfully may finish in less time.*

The student whose needs are not completely met by existing conventional programs may wish to investigate and apply for the Individualized Curriculum Program (see the General Requirements and Regulations section).

R.O.T.C. students are allowed certain modifications of the requirements, as explained in the General Requirements and Regulations section.

*This plan is not encouraged if the student intends to hold a strenuous or time-consuming outside job regularly while enrolled in classes.

PRE-COLLEGE

SUBJECT	Requirements High School Units
English	3
United States history and civics	1
Algebra	2
Geometry	1
Science or additional mathematics	1
Others	8
	16

IN THE UNIVERSITY

COURSE REQUIREMENTS (Other Than the Major and Minor)

UNIVERSITY CORE COURSES		Quarter Hours of Credit
English 550-551 Basic Composition I-II		8
Speech 652 Business and Professional Speech		3
Humanities electives:		8
English: 600-level literature course	4	
Philosophy and Religious studies elective OR humanities elective	4	
Social Studies electives:		20
Economics 520 Principles of Economics I	3	
Economics 621, 622 Principles of Economics II, III	7	
Psy 560 General Psychology	4	
Electives*	6	
Electives*	6	
Science electives:		13
Science electives	8	
Math. 542 Applied Finite Mathematics	5	

AND

*Social Studies electives may be satisfied by acceptable courses for the degree in the following departments: Geography (excluding 503, 603, 604 and 625 which are applicable to the science electives), History, Political Science, Psychology, and Sociology, Anthropology and Social Science.

	Requirements
Liberal arts electives**	5
Health and Physical Education 590 Health Education	3
Health and Physical Education activity courses	3
**The electives are specifically identified in each curriculum.	63

SCHOOL OF BUSINESS ADMINISTRATION CORE COURSES	Quarter Hours of Credit
Accounting 605, 606 Elementary Accounting I, II	10
Economics 624, Economics and Social Statistics I	4
Finance 720 Business Finance	4
Management 511 Introduction to Business	3
Management 704 Legal Environment of Business or Management 715 Business Law I	4
Management 725 Fundamentals of Management	4
Management 750 Human Behavior in Organization	4
Marketing 624 Fundamentals of Marketing	5
	38

REQUIREMENTS IN ADDITION TO COURSES	Quarter Hours of Credit
Completion of the number of quarter hours required for degree	186 to 194

Upper Division status (including completion of any specified preparatory courses not completed at time of entrance).
Major and minor requirements.
See the year-by-year curriculums in the Curriculums section.
Course-level requirements.
Point index requirement.
Residence requirement.
Application for graduation.

NOTE: Students taking courses to satisfy high school deficiencies must take additional credit hours to complete the requirements for the degree.

REQUIREMENTS FOR THE MAJOR AND MINOR

The courses required for the majors in accounting, advertising and public relations, finance, industrial management, management, fashion or industrial or retail marketing, marketing management, and transportation management are stated in the announcements of the Accounting and Finance, Advertising and Public Relations, Management, and Marketing departments. The combined major in advertising art is stated in the announcement of the Advertising and Public Relations Department. The combined majors in general administration and public administration are stated in the announcements of the Management Department. The major in secretarial studies is stated in a separate announcement at the end of the Curriculums section. The year-by-year curriculums that appear in the Curriculums section include all required courses. The minor for this degree must be in a field related to the major, or in one approved by the department chairman of the student's major. A grade of *C* or better is required in each course counted toward the major and minor.

OBJECTIVES

Our responsibility in the School of Business Administration, by the nature of its name, demands that we educate our students for particular areas of employment according to their choice. Consequently, formal diversified programs of study have been designed to accomplish this end.

Although many of our students are preparing for professional competency in one particular area, our students receive a truly broad liberal education. Over half of their academic work is within the scope of liberal arts education and many of the courses in the School of Business Administration have a behavioral science approach in today's ever-changing environment.

The courses taught in the School of Business Administration are varied in nature. Therefore, teaching methodology must conform to the needs and requirements of each individual course and instructor. However, full emphasis is given to the class discussion type method, and exchange of ideas between professor and pupil is encouraged.

COURSES OF INSTRUCTION AND CURRICULUMS

The student should be familiar with the course-numbering system and its significance, as well as the abbreviations used to indicate the amount of credit. These are explained at the end of the General Requirements and Regulations section. Each student is charged with the responsibility to check the catalog for prerequisites for each course the student wishes to take. This will ensure minimum changes of registration on the student's behalf and will alleviate much of the anguish of a broken or confused schedule. Any waiver of a prerequisite is at the discretion of the teacher with the approval of the department chairman.

Curriculums for the several major fields open to business administration students will be found after the course descriptions. Each curriculum contains all the courses prescribed for a major in the field indicated, and enables the student to complete a minor in a specified or related field. It also provides the 186 to 194 quarter hours (as specified) needed for graduation and includes courses that meet all general course requirements and all degree course requirements.

R.O.T.C. students may have certain course requirements waived or modified: See Modification for R.O.T.C. students, in the General Requirements and Regulations section.

ACCOUNTING AND FINANCE

Professors Miller and Ross; Associate Professors Arnold (chairman), Bensinger, Chuey, M. Evans, Grim, Hankins, Magner, McCardel, Petrych, Schneider, Smolen, Urbancic, Volpe and Zetts; Assistant Professors Lacich and Smith; Instructor Gross.

Accounting courses provide a study of record keeping methods and the presentation, analysis, and interpretation of financial and statistical data. Courses covering accounting theory, data processing, cost analysis, consolidated statements, auditing, taxes, and other areas in accounting, are offered for the students interested in this field of specialization. They are designed for students who want to become accountants in business and industrial firms; to prepare for certification through experience in the employ of certified public accountants; to acquire a knowledgeable background in accounting as a tool for careers in business at the executive level; or to enter the teaching profession.

In view of this variety of aims and interests, the student may take either a major or minor in accounting. The curriculum for a major in accounting consists of 45 quarter hours as outlined in the curriculum printed in the Curriculums section. A student majoring in accounting must have a minor of at least 21 or more quarter hours in a related field or in a field approved by the chairman of the Accounting and Finance Department.

A suggested minor in accounting consists of 24-25 quarter hours and generally includes Accounting 605, 606, 701, 702, and a choice of 713 or 813.

The finance concentration consists of courses in financial analysis, finance theory, credit management, insurance, and securities markets. Each student is exposed to each of these areas to some degree. Electives allow the student to pursue the specific aspect of finance that is most appealing. The courses are designed to provide the student with sufficient tools to enter any number of financial areas or to provide sufficient background for working in business and industrial firms.

The curriculum for a major in finance consists of 45 quarter hours in accounting and finance courses as outlined in the curriculum section. A student majoring in finance must have a minor of at least 21 or more quarter hours in a related field or in a field approved by the chairman of the Accounting and Finance Department.

A suggested minor in finance consists of 22-23 quarter hours and generally includes Finance 717, 720, 722, 730, plus 9-10 additional hours.

A grade of C or better in Accounting 606 is prerequisite to all more advanced courses in accounting and finance.

Accounting Sequence
Lower Division Courses

604. *Accounting for Professional Offices.* An introduction to general accounting principles and procedures emphasizing their application to a service related enterprise such as a medical, legal or real estate office. Topics to be covered include the accounting cycle, control of cash transactions, receivables, payables, and payroll accounting. (Not applicable to graduation requirements of School of Business Administration Students.) 5 q.h.

605. *Elementary Accounting I.* Fundamentals of accummulating accounting data and the development of the complete accounting cycle with emphasis upon working papers

and classified financial statements for service, merchandising, and manufacturing operations. Problems supplement the theory, principles, and management applications. 5 q.h.

606. *Elementary Accounting II.* Develop an understanding of how the accumulated accounting data are effectively used by students who will make accountancy a career, as well as for students who will use accounting as a tool in other fields of specialization or in carrying on their personal affairs. A practice set and problems supplement the theory, principles, and management applications. Prereq.: Accounting 605. 5 q.h.

610. *Introduction to Accounting Systems and Data Processing.* This course introduces students to the problems of recording, handling, and processing information, particularly as it is related to the accounting framework. Students are required to learn a basic language (Fortran or Cobol) and also become familiar with hardware and software aspects of electronic data processing. Prereq.: Management 511. 4 q.h.

Upper Division Courses

701, 702. *Intermediate Accounting I, II.* A detailed study of the theoretical background of accounting principles and procedures. Emphasis is placed on the proper reporting of net income, classification of equity by source, various methods of inventory accounting, problems connected with fixed assets and their depreciation, and techniques of analysis of financial operations. Prereq.: *C* or better in Accounting 606. 5+5 q.h.

713. *Basic Cost Accounting.* The role of the accountant in the organization; cost accumulation for product costing; job order costing; cost behavior and volume-profit relationships; responsibility costing; cost structures for control and motivation; the contribution margin approach; non-manufacturing costs; relevant costs for non-routine decision making, and the elementary principles of budget applications. Prereq.: *C* or better in Accounting 606. 5 q.h.

714. *Advanced Cost Accounting.* This course covers estimating, standard and differential costing and the application of these principles in the compilation and preparation of budget data for managerial and administrative purposes. Prereq.: *C* or better in Accounting 713. 3 q.h.

721. *State and Local Taxes.* The theory applicable to state and local taxation concepts is reviewed in detail. Primary emphasis is concentrated on general and specific taxation principles in current use by state and local governmental units located throughout the United States. Prereq.: Junior standing. 3 q.h.

801. *Advanced Accounting.* Partnerships: formation, operation, and liquidation: installment sales; consignments; branch accounting; receivership; joint ventures; consolidations and mergers. Prereq.: *C* or better in Accounting 702. 5 q.h.

807. *Auditing.* Auditing practices and procedures are introduced and related to problems encountered in actual practice. A short audit case is worked through by the student. Prereq.: *C* or better in Accounting 713 and 801. 5 q.h.

810. *Statement Analysis.* The flow of funds as reflected in financial statements. The use of ratios and other indices in interpreting a concern's financial position, operating position trends, and other variations. Prereq.: Accounting 606. 3 q.h.

813. *Federal Tax Theory.* The principles underlying our income tax laws. Emphasis is placed on items included or excluded in determining income subject to tax; sales or exchanges; basis for determining gains or losses; capital assets and treatment of capital gains and losses by all taxpayers; business deductions including bad debt losses, operating losses, depreciation, depletion, installment sales; special problems affecting corporations, capital changes and securities. Prereq.: Junior standing. 4 q.h.

814. *Federal Tax Practice.* Emphasis is placed upon special areas of tax law as it pertains to partnerships, estates and trusts, gift taxes, estate taxes, and payroll taxes. The student is trained in researching tax law; the student prepares tax returns on official tax forms. Prereq.: *C* or better in Accounting 813. 4 q.h.

820. *Governmental and Funds Accounting.* The principles and standards, terminology, and classifications of accounts for governmental organizations and nonprofit organizations. General and specific funds' applications as to budgets, revenues and expenditures, fixed assets, bonded debt and interest and interfund relationships and transfers are reviewed. Prereq.: Accounting 606. 3 q.h.

830. *Introduction to Budgeting.* A study through problem solving and case analysis of

business budgeting. The course is concerned with the basic techniques and tools of budgeting, profit planning, and incremental costs. Prereq.: Accounting 701 or 713. 4 q.h.

840. *Accounting Internship Program.* Observational and participatory accounting and professional business experience under the direction of University faculty members and partners of the accounting firms participating in the program. This program is offered during the winter quarter of each academic year. The candidates will be employed full-time for the entire quarter in the offices of the participating accounting firms. Weekly campus conferences are required, and attendance at these conferences is mandatory. A written evaluation of the job experience is required by students and firms. Prereq.: Accounting major, junior standing, 2.75 accounting average, and 2.50 overall average, and approval of internship committee. 4 q.h.

ACCOUNTING

The accounting curriculum requires a total of 194 hours.

FIRST YEAR	Hrs.
Acctg. 605, 606 Elementary Accounting I, II	10
Econ. 520 Principles of Economics I	3
Engl. 550-551 Basic Composition I-II	8
Math. 542 Applied Finite Mathematics	5
Math. 550 Calculus for Social, Managerial and Life Sciences I	5
Mgt. 511 Introduction to Business	3
Psych. 560 General Psychology	4
Science Elective	4
H&PE 590 Health Education	3
H&PE activity courses	3
	48

SECOND YEAR	Hrs.
Acctg. 610 Introduction to Accounting Systems and Data Processing or Computer Science 600 Introduction to Programming	4
Acctg. 701, 702 Intermediate Accounting I, II	10
Econ. 621, 622 Principles of Economics II, III	7
Econ. 624 Economics and Social Statistics I	4
Engl. 600-level literature elective	4
Mktg. 624 Fundamentals of Marketing	5
Science elective	4
Social Studies electives	8
Speech 652 Business and Professional Speech	3
	49

THIRD YEAR	Hrs.
Acctg. 713 Basic Coast Accounting	5
Acctg. 801 Advanced Accounting	5
Econ. 705 Economics and Social Statistics II	3
Fin. 720 Business Finance	4
Mgt. 715, 716 Business Law I, II	8
Mgt. 725 Fundamentals of Management	4
Mgt. 735 Communications for Management and Business	4
Philosophy and Religious Studies elective or Humanities elective	4
P Rel. 710 Basic Public Relations	3
Liberal Arts elective	3
Electives	6
	49

FOURTH YEAR	Hrs.
Acctg. 807 Auditing	5
Acctg. 813 Federal Tax Theory	4
Acctg. electives (Upper Division)	6
Economics elective (Upper Division)	4
Fin. 722 Insurance Fundamentals	3
Mgt. 737 Management Science or Upper Division electives	4
Mgt. 750 Human Behavior in Organization	4
Mgt. 850 Policy Formulation and Administration	4
Electives (Upper Division)	6
Electives	8
	48

Finance Sequence
Lower Division Course

600. *Personal Finance* The course will emphasize the many diverse financial decisions which an individual will face. Areas such as taxes, insurance, home buying, and borrowing will be examined. 3 q.h.

Upper Division Courses

717. *Real Estate Principles.* Principles of real property ownership and real estate practices; types of deeds, leases, and restrictions; real estate brokerage, selling, and advertising; property management; subdividing and developing; zoning and its effects. Prereq.: Management 704 or 715. 3 q.h.

718. *Real Estate Finance and Problems.* Methods of financing ownership or occupancy of real property. Real estate and real estate paper as a field of investment. Problems involved in appraisal and practical methods of appraisal. Individual research. Prereq.: Finance 717. 3 q.h.

720. *Business Finance.* A study of the financial problems associated with the life

cycle of a business. This course consists of the analysis of problems relating to estimating the financial needs of an enterprise and to evaluating the alternative means of providing temporary and permanent capital. The relationship of current financial decisions with financial policy is analyzed from the viewpoint of management and the investor. Prereq.: Accounting 606. 4 q.h.

722. *Insurance Fundamentals.* The fundamental nature of risk and its influence upon all human activities is studied. Principles of insurance, insurance coverage, and other loss-bearing techniques are examined. Prereq.: Management 704 or 715. 3 q.h.

723. *Life Insurance.* The fundamental nature of life insurance and the principles and technical facts in the field of study. The proper use of life insurance in personal and business planning. Prereq.: Management 704 or 715. 3 q.h.

724. *Credit Management.* The nature, uses, and general functions of credit plus the credit instruments and legal aids for the credit department are presented. Management of the business credit-granting function; management of the consumer credit-granting function; investigation and analysis of mercantile, bank, and foreign credit risks; analysis of financial statements for credit purposes; control of accounts receivable in relation to sales, inventory, and working capital; and the control of credits and collections are evolved. Prereq.: Accounting 606, Management 704 or 715. 3 q.h.

730. *Investment Analysis and Management.* Studies the nature and investment merits of corporate bonds, preferred stocks, and common stocks from the viewpoint of the individual investor. Special factors relating to the analysis of securities of public utilities, banks, and investment companies are also considered. Principles of portfolio management for individual investors are analyzed. Preq.: Junior standing. 3 q.h.

731. *The Stock Market.* Considers organization, operation, and regulation of security market. Practices, procedures, and regulations relating to the listing of securities and to the buying and selling of securities are covered. Prereq.: Finance 730 or consent of the department chairman. 3 q.h.

833. *Regulated Industry Finance.* Financial management in investor-owned regulated industries. Will focus on problems associated with selling debt and equity by public utilities, and surface and air transportation industries in which government regulation is an explicit operating constraint. Prereq.: Finance 720. 3 q.h.

835. *Advanced Business Finance.* The policies and practices required for effectively planning and controlling the sources and uses of a company's funds are analyzed, with emphasis on the adaptation of financial principle promotion, long-term financing, income administration, expansion, and reorganization. Prereq.: Finance 720. 4 q.h.

839. *Security Analysis.* The major emphasis will be on security analysis and investment decision-making utilizing the financial records of business firms. Attention will be given to the critical analysis and interpretation of these financial records. A project involving the application of analytical techniques is a requirement. Prereq.: Accounting 606, Accounting 610 or Computer Science 600, Finance 730 or Accounting 801. 4 q.h.

840. *Financial Institutions.* This course investigates the financial intermediary uses of funds of the contemporary businessman. Specifically, the capital markets and the money markets, instruments, and institutions such as bond syndication, small business investment companies, real estate development and holding companies, and other types of investment companies are analyzed. Prereq.: Finance 720. 3 q.h.

FINANCE

The finance curriculum requires a total of 194 hours.

FIRST YEAR	Hrs.
Econ. 520 Principles of Economics I	3
Engl. 550-551 Basic Composition I-II	8
Math. 542 Applied Finite Mathematics	5
Math. 550 Calculus for Social, Managerial and Life Sciences I	5
Mgmt. 511 Introduction to Business	3
Psych. 560 General Psychology	4
Science electives	8
Soc. 500 Fundamentals of Sociology	4
Elective	3
H&PE 590 Health Education	3
H&PE activity courses	3
	48

SECOND YEAR	Hrs.
Acctg. 605, 606 Elementary Accounting I, II	10
Acctg. 610 Introduction to Accounting Systems and Data Processing or Computer Science 600 Introduction to Programming	4

Econ. 621, 622 Principles of Economics II, III	7
Econ. 624 Economics and Social Statistics I	4
Engl. 600-level literature elective	4
Mktg. 624 Marketing	5
Philosophy and Religious Studies elective or Humanities elective	4
Pol. Sci. 601 American National Government	4
Speech 652 Business and Professional Speech	3
Elective	3
	48

THIRD YEAR	Hrs.
Acctg. 701, 702 Intermediate Accounting I, II	10
Econ. 701 Money and Banking	4
Econ. 705 Economics and Social Statistics II	3
Fin. 717 Real Estate Principles	3
Fin. 720 Business Finance	4
Fin. 722 Insurance Fundamentals	3
Fin. 730 Investment Analysis and Management	3
Mgt. 715, 716 Business Law I, II	8
Mgt. 725 Fundamentals of Management	4
Mgt. 735 Communications for Management and Business	4
P Rel. 710 Basic Public Relations or elective	3
	49

FOURTH YEAR	Hrs.
Acctg. 830 Introduction to Budgeting	4
Econ. 702 Public Finance or Econ. 712 Intermediate Macro-Economic Theory	4-5
Fin. 718 Real Estate Finance and Problems	3
Fin. 723 Life Insurance	3
Fin. 731 The Stock Market	3
Fin. 833 Regulated Industry Finance or Finance or Accounting elective	3
Fin. 835 Advanced Business Finance	4
Fin. 839 Security Analysis or Finance or Accounting elective	4
Mgt. 750 Human Behavior in Organization	4
Mgt. 850 Policy Formulation and Administration	4
Mkgt. 815 Marketing Research or Upper Division elective	4
Electives	7-8
	48

ADVERTISING AND PUBLIC RELATIONS

Associate Professors Seibold (chairman), Flad, Lang, Mamula, and Sekeres; Instructor Simmons.

Advertising courses provide a study of the forms, methods, costs, and uses of advertising. They are designed both for students who plan to enter the advertising field and for those who wish a knowledge of advertising for other purposes.

Public relations courses complement the advertising courses for students who wish to enter any of the following fields; advertising agencies; newspapers, radio and television; or positions in the area of advertising and public relations in commercial firms, any of the nonprofit public service organizations, or governmental agencies.

A major in advertising and public relations consists of 46 quarter hours; it includes 32 quarter hours in the advertising sequence and 14 quarter hours in the public relations sequence as outlined in the curriculum printed in the Curriculums section.

In cooperation with the Art Department, a combined major in advertising art is also offered and consists of a minimum of 75 quarter hours in the advertising and public relations sequences, art, and marketing as outlined in the curriculum printed in the Curriculums section.

A student majoring in advertising and public relations or advertising art must have a minor of at least 21 quarter hours in a related field or in a field approved by the chairman of the Advertising and Public Relations Department.

A suggested minor in advertising consists of 22 quarter hours in the advertising sequence and includes Advertising 631, 632, 725, and 727 plus six additional hours.

Advertising Sequence
Lower Division Courses

631. *Advertising Fundamentals.* A comprehensive study of advertising in the framework of modern business and selling activities, including the various forms of advertising. This course includes the economics, methods, and psychology of advertising, with an introduction to copywriting, visualization, layouts, print production, and typography. This course also deals with media planning and selection, and the proper use of newspapers, magazines, radio and television in the overall advertising campaign. 4 q.h.

632. *Advertising Procedures.* The course includes the study of media, including outdoor advertising, transit advertising, direct mail promotion, films, advertising specialties, premiums, and various supplementary media. Also covered are trademarks, packaging, marketing research, dealer programs, the complete campaign, retail advertising, and industrial advertising. The course concludes with a history of the advertising profession, a study of the advertising management function, and a summary of the various laws and

regulations pertaining to advertising. Prereq.: Advertising 631. 4 q.h.

Upper Division Courses

725. *Advertising Copywriting.* Definition and discussion of the various elements of copywriting. Practical and creative application of copywriting; the writing of headlines, body copy, brand names, trademarks, and slogans, in consumer, industrial, and business publications. Class will meet five hours a week with three hours of lecture and two hours of workshop. Prereq.: Advertising 632. 4 q.h.

727. *Advertising Layout.* Emphasis is on the actual making of layouts; complete layouts that have good attention value, attractive style, clarity and definite sales appeal. Layouts are designed for magazine and newspaper advertisements, direct mail, magazine covers, outdoor posters, packages, and graphic arts in television. Class will meet five hours a week with three hours of lecture and two hours of workshop. Prereq.: Advertising 725. 4 q.h.

811. *Direct Mail Advertising.* The planning and preparation of the major types of direct mail advertising, including the discussion and writing of sales letters, leaflets, folders, brochures, booklets, catalogs, house organs and a study of mimeographing, multigraphing, various types of printing, and engraving. Prereq.: Advertising 725. 3 q.h.

814. *Advertising Case Studies.* Actual case histories from the files of leading business firms. Analysis of these cases and their promotional backgrounds provide an understanding of the practical application of advertising to specific business situations. The student is the decision-making business executive who must resolve various advertising problems. Included are the psychodynamics of creativitity and imagination as vital components of the problem-solving process. Prereq.: Advertising 725. 3 q.h.

815. *Radio and Television Advertising.* The history, organization, and practices of the broadcasting profession from the viewpoints of both the advertiser and the advertising agency, and of the stations and networks. The course includes the consideration of such problems as choosing the station, the time and the method of broadcast, types of programs, the writing and production of various kinds of commercials, and merchandising the campaign to the trade and to the consumer. Prereq.: Advertising 725. 3 q.h.

819. *Retail Advertising.* Methods and procedures used by department stores, hardware stores, drug stores, discount houses, and other retail establishments selling products, goods, or services directly to the public. Preparation of newspaper advertisements, direct mail, point-of-purchase material, displays and, to some extent, radio and television promotion. Merchandise selection, budgeting, month-to-month planning, the use of mat services and canned art, special promotions, community activities, and building of the overall store image. Prereq.: Advertising 727. 3 q.h.

823. *Advertising Problems and Campaigns.* A study of the creative processes which emphasize the ability to express ideas originally and persuasively. The application of fundamental theories and practices to a specific advertising problem, including the development and creation of a complete advertising campaign. This is a highly creative course, and gives the student an opportunity to use his own imagination and ideas in preparing advertisements for all of the media used in modern advertising today. Prereq.: Advertising 727. 4 q.h.

824. *Industrial Advertising.* The analysis, discussion, planning, and preparation of various types of industrial advertising and promotional material. This includes advertisements for industrial and business magazines and trade papers, catalogs, booklets, sales literature, direct mail, purchasing directories, and business reference annuals. Also studied in this course are trade shows, industrial displays and exhibit designing, slide films, motion pictures, and corporate publicity. Presented from the interest-viewpoint of industrial equipment buyers, management executives, and purchasing agents. Prereq.: Advertising 727. 3 q.h.

829. *International Advertising.* Development and growth of international advertising, reflecting the rapid expansion of American manufacturing and distribution in Europe, Asia, and other parts of the world. Promotional methods used to gain acceptance for American products, and the various uses of media to solve the distribution and selling problems in foreign markets. Establishing American agency branch offices; characteristics of multinational markets; cultural and ethnical environment; creative, promotional, and international media strategies; and the economic, social and political effects in this fast-growing field of international advertising,

are reviewed. Prereq.: Advertising 727. 3 q.h.

Public Relations Sequence

710. *Basic Public Relations.* A study of the management function which investigates and evaluates public attitudes, policies, means, and techniques used in the field to earn public understanding and acceptance. Prereq.: Junior standing. 3 q.h.

754. *Media Presentation.* A course that weaves the theory of communications through a study of the fundamentals of journalism (print and broadcast). Surveyed are the organization of news media, the art of interviewing, news-gathering, and the essentials of news writing. The course also looks at news as a valuable consumer commodity in a free society, as this affects the business community. Prereq.: Junior standing. 4 q.h.

756. *Business Publications.* News-gathering and feature writing, with emphasis on the editorial function, particularly as it applies to trade journals and business publications. Each student actively prepares his own material for publication, and takes part in assignments which correlate theory and practice. In addition, the editor works with budget analysis, selection of photos, and choice of type in "dummying-up" trade magazines and business publications. Prereq.: Public Relations 754. 4 q.h.

810. *Advanced Public Relations.* Practical application of the principles of public relations, with attention to organization of ideas, writing for all types of media, psychology and timeliness of presentation, and extemporaneous speaking. Prereq.: Public Relations 710. 3 q.h.

ADVERTISING AND PUBLIC RELATIONS

The advertising and public relations curriculum requires a total of 186 hours.

FIRST YEAR	Hrs.
Art 510 Color and Design I	4
Econ. 520 Principles of Economics I	3
Engl. 550-551 Basic Composition I-II	8
Math. 542 Applied Finite Mathematics	5
Mgt. 511 Introduction to Business	3
Psych. 560 General Psychology	4
Science electives	8
Social Studies electives	8
H&PE 590 Health Education	3
H&PE activity courses	3
	49

SECOND YEAR	Hrs.
Acctg. 605, 606 Elementary Accounting I, II	10
Adver. 631 Advertising Fundamentals	4
Adver. 632, Advertising Procedures	4
Econ. 621, 622 Principles of Economics II, III	7
Econ. 624 Economics and Social Statistics I	4
Engl. 600-level literature elective	4
Mktg. 624 Fundamentals of Marketing	5
Mktg. 625 Salesmanship	3
Speech 652 Business and Professional Speech	3
Humanities elective	3
	47

THIRD YEAR	Hrs.
Adver. 725 Advertising Copywriting	4
Adver. 727 Advertising Layout	4
Art 623 Graphics Design I	3
Art 780 Photography I or Upper Division elective	4
Mgt. 704 Legal Environment of Business	4
Mgt. 725 Fundamentals of Management	4
Mgt. 735 Communications for Management and Business	4
P Rel. 710 Basic Public Relations	3
P Rel. 754 Media Presentation in Business	4
P Rel. 756 Business Publications	4
Liberal Arts elective	3
Electives	5
	46

FOURTH YEAR	Hrs.
Adver. 811 Direct Mail Advertising	3
Adver. 814 Advertising Case Studies	3
Adver. 815 Radio and Television Advertising	3
Adver. 823 Advertising Problems and Campaigns	4
Advertising elective	3
Fin. 720 Business Finance	4
Mgt. 750 Human Behavior in Organization	4
Mktg. 815 Marketing Research	4
Mktg. 820 Sales Promotion or Elective (Upper Division)	3
P Rel. 810 Advanced Public Relations	3
Philosophy and Religious Studies elective or Humanities elective	4
Elective (Upper Division)	3
Elective	3
	44

ADVERTISING ART

The advertising art curriculum requires a total of 194 hours.

FIRST YEAR	Hrs.
Art 510 Color and Deisign I	4
Art 513 Survey of Art or Humanities elective	3
Econ. 520 Principles of Economics I	3
Engl. 550-551 Basic Composition I-II	8

Math. 542 Applied Finite Mathematics	5
Mgt. 511 Introduction to Business	3
Psych. 560 General Psychology	4
Science Elective	4
Social Studies electives	8
H&PE 590 Health Education	3
H&PE activity courses	3
	48

SECOND YEAR	Hrs.
Acctg. 605, 606 Elementary Accounting I, II	10
Adver. 631 Advertising Fundamentals	4
Adver. 632 Advertising Procedures	4
Art 601 Drawing or Art 602 Drawing Techniques	3
Art 611 Printmaking or Art 600-level Elective	4
Econ. 621, 622 Principles of Economics II, III	7
Econ. 624 Economics and Social Statistics I	4
Mktg. 624 Fundamentals of Marketing	5
Science elective	4
Speech 652 Business and Professional Speech	3
	48

THIRD YEAR	Hrs.
Adver. 725 Advertising Copywriting	4
Adver. 727 Advertising Layout	4
Art 606 Painting I	4
Art 623 Graphics Design I	3
Art 624, 625 Graphics Design II and III	6
Art 705 Advanced Drawing	3
Engl. 600-level literature elective	4
Mgt. 704 Legal Environment of Business	4
Mgt. 725 Fundamentals of Management	4
Mgt. 735 Communication for Management and Business	4
Philosophy and Religious Studies elective or Humanities elective	4
P Rel. 710 Basic Public Relations	3
Elective	3
	50

FOURTH YEAR	Hrs.
Adver. 823 Advertising Problems and Campaigns	4
Advertising or Public Relations electives	6
Art 727, 728 Graphics Design IV V	6
Fin. 720 Business Finance	4
Mgt. 750 Human Behavior in Organization	4
Mktg. 733 Furnishings	4
Mktg. 745 Textile Fabrics or Mktg. 750 Industrial Textile Products	5
Mktg. 820 Sales Promotion or Marketing elective (Upper Division)	3
Electives (Upper Division)	9
Elective	3
	48

BUSINESS EDUCATION

For the major in business education, see the School of Education.

MANAGEMENT

Professors Curran (Chairman), Hovey, Kohn, Krishnan and Shuster; Associate Professors Long, Rahim, Rao, Walsh and Wolanin; Assistant Professors Daly, Dastoli, Katz, Provance, Psenicka and Winick.

The Department of Management offers courses in various business subjects which (a) complement those of other departments in the School of Business Administration; (b) provide for the majors/combined majors in (i) Industrial Management, (ii) Management, (iii) Transportation Management, (iv) General Administration, (v) Public Administration, and (vi) program for the completion of a B. S. in Business Administration with a major in Secretarial Studies; and (c) provide for the minor in Management.

The majors in Management and their requirements in Management courses are: Industrial Management, a total of 45 quarter hours; Management, a minimum of 45 quarter hours; and Transportation Management, a total of 45 quarter hours. The combined major in General Administration consists of a minimum of 75 quarter hours in accounting, management, and marketing. The combined major in Public Administration consists of a minimum of 75 quarter hours in accounting, management, political science, and sociology and anthropology. See the curriculums for each of these majors which are printed in the Curriculums section.

A student majoring in General Administration, Industrial Management, Management, Public Administration, or Transportation Management must have a minor of at least 21 quarter hours in a related field or in a field approved by the chairman of the Management Department.

A suggested minor in Management consists of a minimum of 21-23 quarter hours and includes Management 704 or 715, 725, and 750 plus 9-11 additional quarter hours.

The major in Business Education is done under the direction of the School of Education.

Lower Division Courses

511. *Introduction to Business.* An overview of the broad concept of business to provide a foundation for understanding the interrela-

tionship of the various functions of business in order to determine areas of interest and aptitude. 3 q.h.

605. *Transportation Rates I.* The study of shipping documents, freight classifications, shipping rules, tariff publishing rules and regulations. 3 q.h.

606. *Transportation Rates II.* The practical application of rates, tariffs, and classifications. Particular rate problems are used in this application. Prereq.: Management 605. 3 q.h.

Upper Division Courses

704. *Legal Environment of Business.* Various sources of laws, basic legal reasoning and application. Emphasis to be placed upon basic legal concepts of contracts, labor, tax, anti-trust and business organizations, and their relationship to business and society. Prereq.: Junior standing. 4 q.h.

705. *Principles of Transportation.* The historical, economic, and regulatory background of transportation is studied. Emphasis is placed on the economic basis of rates and market centers. The valuation of property assets and their rate of return is given consideration. Prereq.: Economics 622. 4 q.h.

707. *Commercial Motor Transportation.* Passenger and freight operations of road vehicles; financing and leasing of vehicles for delivery; rate-making constructions and economics of motor carrier services, insurance and proper protection for carriage, and liability for cargo and passengers; terminal methods and procedures; and federal, state, and municipal regulations and restrictions as to weight, length, and public liability. Prereq.: Junior standing. 5 q.h.

715. *Business Law I.* A study of business law and its role in modern society. The formation of contracts, the legal requisites of an enforceable agreement, fraud, duress, etc., the transfer of contractural rights, discharge of contracts, relationship between principal and agent, employer and employee, and their responsibilites are studied. Bailments with reference to their nature, classification and termination, carriers are analyzed. The provisions of the Uniform Commercial Code are studied with reference to the sales contract, transfer of titles, warranties, duties, liabilities, rights, and remedies of the parties. Federal Consumer Credit Protection Act (Truth-in-Lending) is discussed. Prereq.: Junior standing. 4 q.h.

716. *Business Law II.* Aspects of commercial paper, requisites and meaning of negotiability, rights and liabilities, defenses and discharge under the Uniform Commercial Code. Bank deposits and collections, personal property and public rights in private property are covered. The partnership: creation, authority of partners, duties, rights, liabilities, and terminations are considered. The corporation with its nature, classification creation and dissolution, stock rights, liabilities, stockholders, bankruptcy and management is analyzed. Real property, deeds, conveyancing, trusts, and mortgages are covered. Prereq.: Management 704 or 715. 4 q.h.

719. *Personnel Selection.* Review of current research in career planning. Emphasis on relationship of job interviewing to the staffing process. Teaches persons to conduct selection interviews. Prereq.: Junior standing in School of Business Administration or consent of the instructor. 3 q.h.

725. *Fundamentals of Management.* This course emphasizes the basic principles of management rather than those involving business organization. It studies the nature of managerial action within an organization, formal and informal structure, process of making decisions, and interrelated activities in management. Prereq.: Junior standing. 4 q.h.

726. *Planning and Controlling.* An in-depth analysis of the relationship between planning and controlling as components of the managing process. Prereq.: Management 725. 4 q.h.

728. *Simulation Techniques in Business.* Introduces the student to the use of simulation techniques and their application in business. Several simple models representing situations in business and other areas which contain elements of risk or uncertainty will be developed. Some of these models will be adapted for computer simulations and the resulting outputs will be used for class discussion and evaluation. Prereq.: Accounting 610, Computer Science 600, or other course in Fortran or equivalent language. 3 q.h.

735. *Communication for Management and Business.* Communication as a means for the coordination and control of organizational activities. Emphasis is placed on internal and external organizational correspondence. Various types of letters and reports are examined and prepared. Prereq.: English 551 and Management 725 or consent of the instructor. 4 q.h.

737. *Management Science.* An under-

standing of methods of management science from an executive or managerial viewpoint, emphasizing formulation of business problems in quantitative terms. Topics such as linear programming, dynamic programming, game theory, Monte Carlo method, probability theory, queueing theory, inventory theory, transportation method, and simulation will be discussed and evaluated. Prereq.: Math. 542, Accounting 610 or Computer Science 600, and Economics 624. 4 q.h.

740. *Office Management and Methods.* A study of office management, its nature and characteristics. Common office work, services, systems, procedures, and methods are analyzed. The role of new technology and automation in the office management is emphasized. Prereq.: Junior standing. 3 q.h.

746. *Industrial Traffic Management.* The nature and function of the traffic manager in industrial organizations; classification, tariffs, and rate formulation, routing, transit privileges, carriers, terminal services, claims procedure, regulations and regulatory procedure, warehousing, material handling, export and import phases of traffic management. Prereq.: Junior standing. 3 q.h.

750. *Human Behavior in Organization.* A study of human factors in the administration function. Emphasis is placed on the contributions of the behavioral sciences to the student of business. Among the topics covered are history of human relations, leadership and its development, labor-management relations, group dynamics, and communication and group processes. Prereq.: Junior standing. 4 q.h.

761. *Information Systems for Management.* A study, from the manager-user point of view, of the application of the systems approach to the design and understanding of dynamic organizations. Includes application of information theory and decision science. Prereq.: Management 725. 4 q.h.

789. *Production Management.* A systematic study of current production theories and practices with particular emphasis on methods analysis, work measurement, wage incentives, production planning and control, plant layout and materials handling, and cost methods. Prereq.: Management 725 and Economics 624. 4 q.h.

804. *Personnel Management.* Deals with objectives, functions, and organization of typical personnel programs, including problems involved in personnel administration. Emphasizes job analysis, job evaluation and description, selection and placement, education and training, safety and health, employee services, employee relations, and the administration of wages and hours. Prereq.: Management 725 and 750. 4 q.h.

808. *Water Transportation.* The history of water transportation is studied. Other objectives of the course are to acquaint the student with the mechanics of making shipments through ocean transport; maritime law; cargo insurance; Federal regulations; and rate conferences. Prereq.: Management 705. 3 q.h.

816. *Problems in Transportation.* Problem study of selected areas in transportation to meet the needs of students having a professional interest in the field. The Interstate Commerce Act is also reviewed for current changes. Prereq.: Management 705. 3 q.h.

820. *Production Control.* An analysis of functions and techniques necessary in planning, routing, scheduling, and controlling flow of materials through various production processes and operations. Prereq.: Management 789. 4 q.h.

850. *Policy Formulation and Administration.* Analysis of typical problems faced by complex organizations. The course will integrate the concepts and techniques learned in the functional areas and apply them from a managerial point of view. Prereq.: Management 725 and 750. 4 q.h.

851. *Problems in Industrial Management.* A series of case problems are presented, analyzed and interpreted covering areas in industrial management. In addition, each student is required to do original research in the field by collecting and analyzing data pertaining to specific problems either at the production or at the administrative level of an industrial enterprise. Prereq.: Management 789. 3 q.h.

852. *Applied Time Series Analysis of Economic and Business Data.* An in-depth analysis of time series models and their applications to problems in economics and business. Emphasis on forecasting. Extensive use of standard computer programs. Prereq.: Econ. 621 and 705. (Cross-listed with Economics 824) 4 q.h.

853. *Economic and Business Data Analysis.* An introduction to the applications of various data analysis techniques for confirming as well as exploring structural relationships among social and economic variables. Topics include interpretation of multiple re-

gression and canonical correlation, principal component analysis, factor analysis and others. The course emphasizes the correct uses of these techniques and the analysis of computer printouts using computer-program packages. Prereq.: Econ. 621 and 705. (Cross-listed with Economics 825.) 4 q.h.

855. *Business Ethics.* Analysis of ethical considerations involved in the management of a business in relation to society, stockholders, customers, employees, competitors, and government. Prereq.: Management 725 and 750. 3 q.h.

860. *Comparative Management.* Comparative study of organization, managerial styles, and leadership in foreign countries based on historical and environmental factors. Analyzing the reasons why managerial activity and the effectiveness of management vary among different business systems. Prereq.: Management 725 and 750. 4 q.h.

870. *Small Business Enterpreneurship.* A study of the small business environment and the problems in starting a business. Students study how small businesses apply the managerial functions in using their resources. Prereq.: Senior standing or consent of the instructor. 4 q.h.

871. *Small Business Practicum.* Students work with actual problems faced by small businesses under faculty supervision. Problems are defined, analyzed and researched. Recommendations are developed and presented to clients for evaluation. Prereq.: Management 870 or permission of the instructor. 4 q.h.

890. *International Business.* Management problems of firms engaged in international business, including the strategy of foreign involvement and control of foreign activities. Emphasis on management issues unique to firms in international operations. Prereq.: Management 725 and 750. 4 q.h.

GENERAL ADMINISTRATION

The general administration curriculum requires a total of 194 hours.

FIRST YEAR	Hrs.
Econ. 520 Principles of Economics I	3
Engl. 550-551 Basic Composition I-II	8
Math. 542 Applied Finite Mathematics	5
Mgt. 511 Introduction to Business	3
Psych. 560 General Psychology	4
Humanities elective	3
Science electives	8
Social Studies electives	8
H& PE 590 Health Education	3
H& PE activity courses	3
	48

SECOND YEAR	Hrs.
Acctg. 605, 606 Elementary Accounting I, II	10
Acctg. 610 Introduction to Accounting Systems and Data Processing or Computer Science.. 600 Introduction to Programming	4
Adver. 631 Advertising Fundamentals	4
Adver. 632 Advertising Procedures	4
Econ. 621, 622 Principles of Economics II, III	7
Econ. 624 Economics and Social Statistics I	4
Engl. 600-level literature elective	4
Mktg. 624 Marketing	5
Mktg. 625 Salesmanship	3
Speech 652 Business and Professional Speech	3
	48

THIRD YEAR	Hrs.
Accounting elective	5
Accounting elective	3-4
Fin. 720 Business Finance	4
Fin. 724 Credit Management or Finance elective (Upper Division)	3
Mgt. 704 Legal Environment of Business	4
Mgt. 705 Principles of Transportation	4
Mgt. 725 Fundamentals of Management	4
Mgt. 735 Communications for Management and Business	4
Mgt. 750 Human Behavior in Organization	4
Mktg. 709 Retail Marketing or Mktg. 720 Industrial Marketing	3
P Rel. 710 Basic Public Relations	3
Philosophy and Religious Studies elective or Humanities elective	4
Elective (Upper Division)	4-3
	49

FOURTH YEAR	Hrs.
Fin. 730 Investment Analysis and Management	3
Mgt. 789 Production Management	4
Mgt. 804 Personnel Management	4
Mgt. 850 Policy Formulation and Administration	4
Mgt. 855 Business Ethics	3
Management elective (Upper Division)	3
Marketing electives (Upper Division)	8
Electives (Upper Division)	11
Electives	9
	49

INDUSTRIAL MANAGEMENT

The industrial management curriculum requires a total of 194 hours.

FIRST YEAR	Hrs.
Econ. 520 Principles of Economics I	3

Engl. 550-551 Basic Composition I-II	8
Math. 542 Applied Finite Mathematics	5
Math. 550 Calculus for Social, Managerial and Life Sciences I	5
Mgt. 511 Introduction to Business	3
Psych. 560 General Psychology	4
Science electives	8
Soc. 500 Fundamentals of Sociology	4
Liberal Arts elective	3
H&PE 590 Health Education	3
H&PE activity courses	3
	49

SECOND YEAR	Hrs.
Acctg. 605, 606 Elementary Accounting I, II	10
Acctg. 610 Introduction to Accounting Systems and Data Processing or Computer Science 600 Introduction to Programming[1]	4
Econ. 621, 622 Principles of Economics II, III	7
Econ. 624 Economics and Social Statistics I	4
Engl. 600-level Literature elective	4
Philosophy and Religious Studies elective or Humanities elective	4
Pol. Sci. 601 American National Government	4
Speech 652 Business and Professional Speech	3
Electives	9
	49

THIRD YEAR	Hrs.
Acctg. 713 Basic Cost Accounting[1]	5
Econ. 705 Economics and Social Statistics II	3
Fin. 720 Business Finance	4
Mgt. 704 Legal Environment of Business	4
Mgt. 705 Principles of Transportation	4
Mgt. 725 Fundamentals of Management	4
Mgt. 735 Communications for Management and Business	4
Mgt. 737 Management Science	4
Mgt. 750 Human Behavior in Organization	4
Mgt. 789 Production Management	4
Mktg. 624 Marketing	5
Mktg. 720 Industrial Marketing[1]	3
P. Rel. 710 Basic Public Relations	3
	51

FOURTH YEAR	Hrs.
Finance elective (Upper Division)	3
Mgt. 804 Personnel Management	4
Mgt. 820 Production Control	4
Mgt. 850 Policy Formulation and Administration	4
Mgt. 851 Problems in Industrial Management	3
Mgt. 855 Business Ethics	3
Management electives (Upper Division) *(See Note)	8
Mktg. 843 Industrial Buying[1]	4
Elective (Upper Division)	6
Elective	6
	45

*NOTE: Major electives to be chosen from the following: Management 728, 746, 761, 860; or Industrial Engineering 705, 711, 712. (See appropriate department section for course descriptions.)

MANAGEMENT

Suggested Curriculum for the Degree of Bachelor of Science in Business Administration with the Major in Management.

The management curriculum requires a total of 186 quarter credit hours.

FIRST YEAR	Hrs.
Econ. 520 Principles of Economics I	3
Engl. 550-551 Basic Composition I-II	8
Math. 542 Applied Finite Mathematics	5
Mgt. 511 Introduction to Business	3
Psych. 560 General Psychology	4
Science electives	8
Social Studies elective	4
Elective	4
H&PE 590 Health Education	3
H&PE Activity Courses	3
	45

SECOND YEAR	Hrs.
Acctg. 605, 606 Elementary Accounting I, II	10
Acctg. 610 Introduction to Accounting Systems and Data Processing or the Equivalent	4
Econ. 621, 622 Principles of Economics II, III	7
Econ. 624 Economics and Social Statistics I	4
Engl. 600-level Literature elective	4
Mktg. 624 Fundamentals of Marketing	5
Philosophy and Religious Studies elective or Humanities elective	4
Pol. Sci. 601 American National Government	4
Speech 652 Business and Professional Speech	3
Elective	3
	48

THIRD YEAR	Hrs.
Acctg. 713 Basic Cost Accounting	5
Fin. 720 Business Finance	4
Mgt. 704 Legal Environment of Business	4
Mgt. 725 Fundamentals of Management	4
Mgt. 735 Communications for Management and Business	4
Mgt. 737 Management Science	4
Mgt. 750 Human Behavior in Organization	4
Mgt. 789 Production Management	4
Management Electives (Upper Division) *(See Note)	8
P Rel. 710 Basic Public Relations	3
Elective	3
	47

FOURTH YEAR	Hrs.
Mgt. 804 Personnel Management	4
Mgt. 850 Policy Formulation and Administration	4
Mgt. 855 Business Ethics	3
Management Electives (Upper Division) *(See Note)	6
Mktg. 815 Marketing Research	4
Electives (Upper Division)	10
Electives	15
	46

*NOTE: Major electives to be chosen from the following: Management 705, 719, 726, 728, 740, 746, 761, 820, 851, 860, 870, or 871. (See department section for course descriptions.)

PUBLIC ADMINISTRATION

The public administration curriculum Requires a total of 194 hours.

FIRST YEAR	Hrs.
Econ. 520 Principles of Economics I	3
Engl. 550-551 Basic Composition I—II	8
Math. 542 Applied Finite Mathematics	5
Mgt. 511 Introduction to Business	3
Psych. 560 General Psychology	4
Science electives	8
Soc. 500 Fundamentals of Sociology	4
Liberal Arts elective	4
Elective	3
H&PE 590 Health Education	3
H&PE activity courses	3
	48

SECOND YEAR	Hrs.
Acctg. 605, 606 Elementary Accounting I, II	10
Acctg. 610 Introduction to Accounting Systems and Data Processing or Computer Science 600 Introduction to Programming	4
Econ. 621, 622 Principles of Economics II, III	7
Econ. 624 Economics and Social Statistics I	4
Engl. 600-level Literature elective	4
Mktg. 624 Marketing	5
Pol. Sci. 601 American National Government	4
Soc. 600 Principles of Sociology or Soc. 711 Cultural Anthropology	4
Speech 652 Business and Professional Speech	3
Elective	3
	48

THIRD YEAR	Hrs.
Acctg. 721 State and Local Taxes or Accounting elective (Upper Division)	3
Econ. 702 Public Finance	4
Fin. 720 Business Finance	4
Mgt. 704 Legal Environment of Business	4
Mgt. 725 Fundamentals of Management	4
Mgt. 735 Communications for Management and Business	4
P Rel. 710 Basic Public Relations	3
Philosophy and Religious Studies elective or Humanities elective	4
Pol. Sci. 720 Public Administration	4
Pol. Sci. 721 Urban Government	3
Pol. Sci. 722 State and Local Government	3
Soc. 708 Political Sociology	4
Electives	5
	49

FOURTH YEAR	Hrs.
Acctg. 820 Governmental and Funds Accounting	3
Finance elective (Upper Division)	3
Mgt. 737 Management Science	4
Mgt. 750 Human Behavior in Organization	4
Mgt. 804 Personnel Management	4
Mgt. 850 Policy Formulation and Administration	4
Mgt. 855 Business Ethics	3
Management elective	3
Electives (Upper Division)	18
Elective	3
	49

TRANSPORTATION MANAGEMENT

The transportation management curriculum requires a total of 194 hours.

FIRST YEAR	Hrs.
Econ. 520 Principles of Economics I	3
Engl. 550-551 Basic Composition I-II	8
Geog. 519 Economic Geography	4
Math. 542 Applied Finite Mathematics	5
Mgt. 511 Introduction to Business	3
Psych. 560 General Psychology	4
Science electives	8
Soc. 500 Fundamentals of Sociology	4
Liberal Arts elective	4
H&PE 590 Health Education	3
H&PE activity courses	3
	49

SECOND YEAR	Hrs.
Acctg. 605, 606 Elementary Accounting I, II	10
Acctg. 610 Introduction to Accounting Systems and Data Processing or Computer Science 600 Introduction to Programming	4
Econ. 621, 622 Principles of Economics II, III	7
Econ. 624 Economics and Social Statistics I	4
Engl. 600-level literature elective	4
Mgt. 605 Transportation Rates I	3
Mgt. 606 Transportation Rates II	3
Mktg. 624 Marketing	5
Speech 652 Business and Professional	

Speech	3
Electives	6
	49

THIRD YEAR	Hrs.
Acctg. 713 Basic Cost Accounting	5
Fin. 720 Business Finance	4
Mgt. 704 Legal Environment of Business	4
Mgt. 705 Principles of Transportation	4
Mgt. 707 Commercial Motor Transportation	5
Mgt. 725 Fundamentals of Management	4
Mgt. 735 Communications for Management and Business	4
Mgt. 746 Industrial Traffic Management	3
Mgt. 750 Human Behavior in Organization	4
Mgt. 789 Production Management	4
Philosophy and Religious Studies elective or Humanities elective	4
Elective (Upper Division)	4
	49

FOURTH YEAR	Hrs.
Finance elective (Upper Division)	3
Mgt. 804 Personnel Management	4
Mgt. 808 Water Transportation	3
Mgt. 816 Problems in Transportation	3
Mgt. 850 Policy Formulation and Administration	4
Mgt. 855 Business Ethics or elective	3
Mktg. 847 Physical Distribution	3
Liberal Arts elective	3
Electives (Upper Division)	12
Electives	9
	47

MARKETING

Professor Almond; Associate Professors Burkholder, Cox (chairman), Deiderick, Mathews, Roussos, and Smith; Assistant Professors Brady, Davis, and Liber.

Marketing courses, industrial and retail, comprise a study of materials and their sources, industrial and retail buying and selling methods, quality analyses, fashions, and methods of promotion. They are designed for the student who wishes to become an owner, purchasing agent, buyer, department manager, manufacturer's representative, stylist, or sales executive.

A major in marketing may be in fashion marketing, industrial marketing, retail marketing, or marketing management. Majors in these fields consist of 45 quarter hours as outlined in the curriculums, printed in the Curriculums section. A student majoring in any of these fields must have a minor of at least 21 quarter hours in a related field or in a field approved by the chairman of the Marketing Department.

A suggested minor in marketing consists of 22-24 quarter hours and includes Marketing 624 and 625 and 14-16 additional hours.

Lower Division Courses

624. *Fundamentals of Marketing.* A general survey, with attention to marketing functions, policies, and marketing institutions involved in the distribution of goods and services, product development and pricing, marketing costs, consumer motivation and buying habits, and governmental regulations. 5 q.h.

625. *Salesmanship.* Knowledge of goods; study of customers and their wants, buying motives and attitudes; planning a sale, meeting objections, closing the sale; cultivation of personality; problems in sales management, organization, planning, and research. 3 q.h.

Upper Division Courses

709. *Retail Marketing.* The entire marketing system considered from the consumer's and management's viewpoint, in theories and practices from the retail managerial approach, with the retailer acting as a consumer's purchasing agent. Consumer attitude toward marketing institutions and their policies, sales promotion, publicity, and public relations as they affect consumer choice, government control as protection to the consumer. Prereq.: Marketing 624. 3 q.h.

713. *Retail Buying.* Study of principles and philosophy that determines excellence in merchandise selection. Management of buying functions, breadth of assortments, depth of stock and development of buying cycles. Gives ethical and legal consideration in buying. Suggests what to buy through consumer behavior, consumer wants, and sales experiences. Designed to provide mastery of the tools that will be used in buying, pricing, stock control, and the analysis of statistical data. Prereq.: Marketing 709 4 q.h.

715. *Management of the Sales Force.* An analysis of the problems facing marketing management in the planning, organizing, and control of the sales force. Cases and problems are used to sharpen analytical techniques in the sales force management areas of organizational structure, selection of salesmen, training, compensation plans, expense plans, morale, stimulation, budgets, quotas, sales territories, routing, analysis and evaluation of sales performance. Prereq.: Marketing 624 and 625. 3 q.h.

720. *Industrial Marketing.* Characteristics of manufacturers' goods, channels of distribution, functions of middlemen, distribution costs, marketing research, government control, and legal limitations. Product policies, service policies, packaging policies, price policies. Industrial advertising organization, planning and budgeting, use of advertising agencies and national advertising media, sales manuals, dealer helps. Prereq.: Marketing 624. 3 q.h.

726. *Effective Consumer Motivation.* Acquaints students with individual and group behavior as it relates to marketing consumer behavior, considered both from the standpoint of the marketing manager and from that of the individual as a consumer. The behavioral sciences serve as a background to provide standards for the social and human evaluation of current marketing activities. Topics covered include: the buyer as a problem solver; buying decision processes and models; measurement of promotional effectiveness and lifestyle analysis. Prereq.: Junior standing. 4 q.h.

731. *Non-Textiles.* Designed to meet the needs of buyers, copywriters, training departments, comparison shoppers, and instructors in consumer and distributive education fields. The principle of planning, selecting and preparing merchandise for promotion through display. The sources of raw materials, manufacturing processes, care, use and selling points of the following types of merchandise are studied: paper products, leather products, furs, jewelry, metals, stones, and cosmetics. 4 q.h.

733. *Furnishings.* A detailed study of furnishings for the home and industries. Consideration is given raw materials, the finished product, quality, selling points, government rulings, and the care of furnishings. The principles of interior illumination and color use. 4 q.h.

745. *Textile Fabrics.* Textile fabrics: cotton, silk, linen, wool, nylon, rayon, and other new materials; methods of dyeing and printing; weaves; twill, plaid, satin, jacquard; tests to distinguish fibers. Government rulings are studied. Uses and wearability of materials are investigated. Swatches of materials are used as illustrations. 5 q.h.

749. *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 includes the study of the fashion market and the psychological and sociological importance of fashion as applied to fabrics. Prereq.: Marketing 745 or consent of the instructor. 5 q.h.

750. *Industrial Textile Products.* The study of the characteristics and specifications of textiles engineered for a specific industrial end use to enable the student to develop a functioning knowledge of textiles, with experiments on fiber, yarn, construction, weaves, and finishes. Industrial Textiles will include such items as upholstery for buses, planes, and automobiles; astronauts' clothing; textiles for operating rooms and specialized clothing as well as the commonly referred-to items: filter cloth, tarpaulins, mail bags, hose, tire and other automotive fabrics, etc. The course would include discussions, visual presentations, projects, reports, observation trips, lectures, guest speakers, and films. Swatches of industrial fabrics are used as illustrations. Prereq.: Junior standing. 5 q.h.

809. *Techniques of Retail Merchandising.* Emphasis on merchandising planning, forecasting, sales, planning markdowns, planning stocks, calculating reorder quantities, planning and controlling expenses, and setting up goal figures as a guide to operations. A collection of up-to-date mathematical problems and cases faced by the retailer are analyzed in making managerial decisions. Prereq.: Marketing 713. 4 q.h.

815. *Marketing Research.* Introduction to the major areas of research in marketing. Attention is given to problem definition, research design, gathering information and analysis to assist marketing management with the decision making process. Both empirical and theoretical concepts are explored. Review of research problems, approaches and trends in industrial retailing, wholesaling, trade association, advertising agency, publishing and consulting firms. Prereq.: Marketing 624 and Economics 624. 4 q.h.

820. *Sales Promotion.* A critical analysis of the range and activities of sales promotion; determining what and where to promote; selecting merchandise for promotion, budgeting, planning, and executing promotional activities; external and internal methods of promotion; and coordination of all sales promotion activities. Prereq.: Senior standing. 3 q.h.

825. *Marketing Management.* A comprehensive study of the management functions

in marketing including organization, planning, research, merchandising, sales, advertising and promotion, marketing channels, and control related to corporate policies and objectives. Management practices covering recruiting, selecting, training, equipping, compensating, and supervising are investigated. Prereq.: Marketing 709 or 720. 3 q.h.

827. *Chain Store Operation.* General merchandising for all types of chain stores; public relations, legal aspects of store operation, organization, personnel work in customer-employee relations, personnel training, buying, managers' most common problems; past, present, and future trends, and other phases. Prereq.: Senior standing. 3 q.h.

831. *Executive Protocol.* A study of the importance of grooming, manners, dress, physical fitness, and personnel relations necessary in today's business world. Emphasis is placed on the courtesies and habits that help develop young men and women into executive material. Prereq.: Junior standing. 2 q.h.

840. *Blueprint Reading.* A study of the basic skills for reading and interpreting blueprints as an aid in industrial purchasing and industrial management. Prereq.: Senior standing. 3 q.h.

843. *Industrial Buying.* A consideration of industrial buying from a purchasing management point of view. Problem areas of bids, control of quality, inventory control, maintaining sources, order points, and integration of the materials management functions with other activities of the firm, are examined. Purchasing, management developments in budgeting, capital equipment determinations, contract cancellations, ethics, make-or-buy decisions, legal aspects, negotiations, and performance evaluation are discussed. Prereq.: Marketing 720. 4 q.h.

845. *International Marketing.* Development of United States trade, foreign trade promotion, organization, export and import procedures and practices. Taught from the viewpoint of the international marketing manager who must recognize differences between markets in various countries as influenced by their particular cultural and economic environment. Prereq.: Marketing 709 or 720 or consent of the teacher. 3 q.h.

846. *Commodity Marketing.* A critical analysis of commodity buying in both the domestic and international markets. The universal role of futures trading and its relation to the local industrial and consumer markets. A simple description of marketing routes, hedging, speculation, price movements, the use of brokers and commission houses in commodity futures trading by the industrial businessman. Prereq.: Marketing 720 or consent of the instructor. 2 q.h.

847. *Physical Distribution.* A consideration of the problems likely to arise in the planning for and movement of goods through channels of distribution from producer to end user. Elements of the logistical system, including transportation modes, plant and warehouse location, and inventory size determinations, are introduced and discussed. Cases and problems are used to sharpen analytical techniques. Final attention turns to the total cost approach of physical distribution analysis and decision making. Prereq.: Economics 624. 3 q.h.

848. *Marketing and Social Responsibility.* Present marketing practices and their impact on the values of society and the impact of social and ethical trends upon marketing. Search for the consumers' interest, the social audits, marketing responsibilities, product safety, ecological considerations, legal restraints and pricing and sales practices. Prereq.: Marketing 624. 3 q.h.

CURRICULUMS

Each curriculum contains all the courses prescribed for a major in the field indicated, and enables the student to complete a minor in a specified or related field. It also provides the 186 to 194 quarter hours (as specified) needed for graduation.

MARKETING

The marketing curriculum requires a total of 186 hours.

FIRST YEAR	Hrs.
Econ. 520 Principles of Economics I	3
Engl. 550-551 Basic Composition I-II	8
Geog. 519 Economic Geography	4
Math. 542 Applied Finite Mathematics	5
Mgt. 511 Introduction to Business	3
Psych. 560 General Psychology	4
Science electives	8
Social Studies elective	4
H&PE 590 Health Education	3
H&PE activity courses	3
	45

SECOND YEAR	Hrs.
Acctg. 605, 606 Elementary Accounting I, II	10
Adver. 631 Advertising Fundamentals	4

Adver. 632 Advertising Procedures	4
Computer Science 600 Introduction to Pro -gramming or Acctg. 610 Introduction to Accounting Systems and Data Processing	4
Econ. 621, 622 Principles of Economics II, III	7
Econ. 624 Economics and Social Statistics I	4
Engl. 600-level literature elective	4
Mktg. 624 Marketing	5
Mktg. 625 Salesmanship	3
Speech 652 Business and Professional Speech	3
	48

Specialization in Industrial Marketing

THIRD YEAR	Hrs.
Acctg. 713 Basic Cost Accounting	5
Adver. 725 Advertising Copywriting or Upper Division elective	4
Mgt. 704 Legal Environment of Business	4
Mgt. 725 Fundamentals of Management	4
Mgt. 735 Communications for Management and Business	4
Mgt. 746 Industrial Traffic Management	3
Mktg. 720 Industrial Marketing	3
Mktg. 726 Effective Consumer Motivation or Marketing elective	4
Mktg. 750 Industrial Textile Products	5
P Rel. 710 Basic Public Relations	3
Liberal Arts elective	3
Electives	6
	48

FOURTH YEAR	Hrs.
Acctg. 810 Statement Analysis or Fin. 724 Credit Management	3
Fin. 720 Business Finance	4
Mgt. 750 Human Behavior in Organization	4
Mktg. 815 Marketing Research	4
Mktg. 825 Marketing Management	3
Mktg. 840 Blueprint Reading	3
Mktg. 843 Industrial Buying	4
Mktg. 845 International Marketing	3
Mktg. 847 Physical Distribution or Marketing elective	3
Marketing electives	6
Philosophy and Religious Studies elective or Humanities elective	4
Elective	4
	45

Specialization in Retail Marketing

THIRD YEAR	Hrs.
Adver. 725 Advertising Copywriting	4
Adver. 727 Advertising Layout or Upper Division elective	4
Mgt. 704 Legal Environment of Business	4
Mgt. 725 Fundamentals of Management	4
Mgt. 735 Communications for Management and Business	4
Mktg. 709 Retail Marketing	3
Mktg. 713 Retail Buying	4
Mktg. 726 Effective Consumer Motivation	4
Mktg. 731 Non-Textiles or Mktg. 733 Furnishings	4
Mktg. 745 Textile Fabrics	5
P Rel. 710 Basic Public Relations	3
Elective	4
	47

FOURTH YEAR	Hrs.
Fin. 724 Credit Management	3
Fin. 720 Business Finance	4
Mgt. 750 Human Behavior in Organization	4
Mktg. 809 Techniques of Retail Merchandising.	4
Mktg. 815 Marketing Research	4
Marketing electives	10
Philosophy and Religious Studies elective or Humanities elective	4
Liberal Arts elective	3
Elective (Upper Division)	3
Elective	7
	46

Specialization in Marketing Management

THIRD YEAR	Hrs.
Fin. 720 Business Finance	4
Mgt. 704 Legal Environment of Business	4
Mgt. 705 Principles of Transportation	4
Mgt. 725 Fundamentals of Management	4
Mgt. 735 Communications for Management and Business	4
Mktg. 709 Retail Marketing	3
Mktg. 715 Management of the Sales Force	3
Mktg. 720 Industrial Marketing	3
Mktg. 726 Effective Consumer Motivation	4
P Rel. 710 Basic Public Relations	3
Marketing electives	5
Philosophy and Religious Studies elective or Humanities elective	4
Liberal Arts elective	3
	48

FOURTH YEAR	Hrs.
Acctg. 810 Statement Analysis or Upper Division Elective	3
Econ. 801 Industrial Organization or Upper Division Elective	4
Mgt. 750 Human Behavior in Organization	4
Mgt. 804 Personnel Management	4
Mgt. 850 Policy Formulation and Administration	4
Mktg. 815 Marketing Research	4

Mktg. 820 Sales Promotion or Marketing elective	3
Mktg. 825 Marketing Management	3
Mktg. 845 International Marketing	3
Mktg. 847 Physical Distribution	3
Marketing elective	3
Electives	7
	45

FASHION MARKETING

The fashion marketing curriculum requires a total of 186 hours.

FIRST YEAR	Hrs.
Art 510 Color and Design I	4
Art 513 Survey of Art	3
Econ. 520 Principles of Economics I	3
Engl. 550-551 Basic Composition I-II	8
Geog. 519 Economic Geography	4
Math. 542 Applied Finite Mathematics	5
Mgt. 511 Introduction to Business	3
Psych. 560 General Psychology	4
Science Elective	8
H&PE 590 Health Education	3
H&PE activity courses	3
	48

SECOND YEAR	Hrs.
Acctg. 605, 606 Elementary Accounting I, II	10
Adver. 631 Advertising Fundamentals	4
Adver. 632 Advertising Procedures	4
Art 601 Drawing	3
Art 602 Drawing Techniques	3
Econ. 621, 622 Principles of Economics II, III	7
Econ. 624 Economics and Social Statistics I	4
Mktg. 624 Marketing	5
Mktg. 625 Salesmanship	3
Speech 652 Business and Professional Speech	3
	46

THIRD YEAR	Hrs.
Adver. 725 Advertising Copywriting	4
Adver. 727 Advertising Layout	4
Computer Science 600 Introduction to Programming or Liberal Arts elective	4
Engl. 600-level literature elective or Humanities elective	4
Mgt. 704 Legal Environment of Business	4
Mgt. 725 Fundamentals of Management	4
Mktg. 709 Retail Marketing	3
Mktg. 713 Retail Buying	4
Mktg. 731 Non-Textiles	4
Mktg. 733 Furnishings	4
Mktg. 745 Textile Fabrics	5
P. Rel. 710 Basic Public Relations	3
	47

FOURTH YEAR	Hrs.
Adver. 819 Retail Advertising	3
Fin. 720 Business Finance	4
Mgt. 750 Human Behavior in Organization	4
Mktg. 749 Fashion Fabrics	5
Mktg. 815 Marketing Research	4
Mktg. 831 Executive Protocol	2
Marketing electives	6
Phil. 710 Aesthetics	4
Soc. 711 Cultural Anthropology	4
Elective (Upper Division)	4
Electives	5
	45

SECRETARIAL STUDIES

NOTE: See the College of Applied Science and Technology section for the first two years of the secretarial studies program. The student, after the completion of the two-year program, may then transfer to the School of Business Administration and satisfy the necessary requirements for the third and fourth years leading to the degree of Bachelor of Science in Business Administration.

Suggested curriculum for the Degree of Bachelor of Science in Business Administration with a Major in Secretarial Studies.

The secretarial studies curriculum requires a total of 194 hours.

THIRD YEAR	Hrs.
Acctg. 713 Basic Cost Accounting*	5
Adver. 631 Advertising Fundamentals	4
Adver. 632 Advertising Procedures	4
Econ. 520 Principles of Economics I	3
Econ. 621, 622 Principles of Economics II, III	7
Econ. 624 Economics and Social Statistics I	4
Engl. 600-level Literature elective	4
Mktg. 624 Fundamentals of Marketing	5
Mktg. 625 Salesmanship	3
Science electives	8
Speech 652 Business and Professional Speech	3
	50

FOURTH YEAR	Hrs.
Acctg. 810 Statement Analysis*	3
Fin. 720 Business Finance	4

Fin. 724 Credit Management	3
Mgt. 725 Fundamentals of Management	4
Mgt. 750 Human Behavior in Organization	4
Mgt. 804 Personnel Management or Management elective 800-level	4
Mktg. 709 Retail Marketing or Mktg. 720 Industrial Marketing	3
P. Rel. 710 Basic Public Relations	3
Philosophy and Religious Studies elective or Humanities elective	4
Electives (Upper Division)**	12
Electives***	3
	47

*The student's qualifications for entering these courses will be determined by the chairman of the Department of Accounting and Finance.

**To be used to complete a minor of 21 or more quarter hours in a related field in courses numbered 600 or above.

***Three hours of electives may be used to satisfy the health and physical education activities requirement.

School of Education

Arnold J. Moore, Dean

ORGANIZATION AND DEGREES

The School of Education is concerned with programs and activities for preparing individuals for a variety of educational positions in schools, colleges, industry, business, welfare, and governmental agencies. It is organized to offer curriculums and/or services for the preparation of: (1) teachers in early childhood, elementary, middle and secondary school classrooms; (2) personnel to serve in various levels of school and administrative positions; (3) supervisory personnel for curricular development and instructional improvement; (4) teachers and other personnel in the area of special education; (5) individuals for a wide variety of guidance and student personnel positions; (6) professional educators in colleges; community, technical, and vocational schools; and governmental agencies.

The School of Education is essentially an Upper Division school comprised of five departments: Foundations of Education; Elementary Education; Guidance, Counseling and Pupil Personnel; Secondary Education; and Special Education. It cooperates with the College of Arts and Sciences, the School of Business Administration, the College of Applied Science and Technology, and the Dana School of Music in preparing teachers for both public and private schools.

Youngstown State University teacher education programs are accredited by the Ohio State Department of Education, the North Central Association of Colleges and Secondary Schools, and the National Council for Accreditation of Teacher Education. The School of Education is responsible to serve as the recommending agent for all Youngstown State University graduates who wish to qualify for Ohio state certification.

Professional courses are offered leading to teacher certification and to the Bachelor of Science in Education degree.

A student has a wide variety of choices if a major in teacher education is selected. This includes elementary education, secondary education and special education.

The elementary education major may pursue specific courses in kindergarten, reading and education media.

If a student majors in secondary education, the student has many teaching fields open. In addition, it is possible to specialize in areas such as art, health, physical education, music, and reading.

The special education major selects one of two programs: Educable Mentally Retarded (EMR) and Learning Disabilities/Behavior Disorder (LD/BD). Candidates for the LD/BD certificate must hold or be eligible to hold some other standard teaching certificate.

Prospective teachers may also be certified on the basis of degrees conferred by the College of Arts and Sciences, College of Fine and Performing Arts, School of Business Administration, and the College of Applied Science and Technology, providing the student meets requirements for admission to Upper Division status in the School of Education and completes the proper preparatory sequences as delineated in the teacher education programs.

The student who wishes to qualify for a B.S. in Education degree enrolls in the School of Education. Upper Division status in the School of Education is obtained upon satisfactory completion of two years of general course requirements at the required level of academic proficiency and upon the demonstration of satisfactory competence in English. Such status must be granted before professional education courses required for certification may be taken.

OBJECTIVES OF TEACHER EDUCATION AT YOUNGSTOWN STATE UNIVERSITY

Having been given the responsibility for the leadership of achieving the functions previously delineated by a commitment to teaching, innovation, and research, the School of Education endeavors to provide for its students and clients:

1. An understanding of the theoretical knowledge about human development, behavior, and learning.
2 The competencies needed to translate the knowledge about the learner and the learning processes into the appropriate teaching behaviors associated with the fostering of student learning and genuine human relationships.
3. A command of the subject matter to be taught and the related fields of inquiry with the ability to use this knowledge in explaining various societal phenomena.
4. A knowledge of the varied instructional materials and media essential for implementing a variety of teaching strategies.
5. Skill in the acquisition of inquiry techniques basic to generalizing knowledge and applying problem-solving approaches to the relevant social issues existing in a pluralistic society.
6. an appreciation of the values and feelings essential for working with individuals and the ability to develop empathic relationships in a wide variety of professional and social roles in diverse educational agencies.
7. An understanding of and commitment to the highest level of professional and ethical treatment of individuals in the exercise of their influence.

REQUIREMENTS FOR THE DEGREES

Bachelor of Science in Education and Bachelor of Arts

It is the student's responsibility to fulfill all the graduation requirements for the appropriate degree. These consist of:

1. The pre-college or preparatory courses for each degree. Typically, these are completed at the high school level. Prior to the junior year, the students must eradicate any deficiencies by a process described in the General Requirements and Regulations section of this catalog.

2. The courses and other requirements to be completed in the University. They are explained in the General Requirements section.

3. The student is required to complete a minimum of 186 quarter hours of credit with a grade point average of at least 2.40 to receive the Bachelor of Science in Education degree.

4. The degree of Bachelor of Science in Education is the degree earned by all students enrolled in the School of Education. It will be awarded only to the student who qualifies for a teaching certificate. Exceptions to this policy can be made only by the Dean of

the School of Education.

5. All students majoring in elementary education and special education must complete requirements in an area of specialization. The term "specialization" is explained in the School of Education section of this catalog under Elementary Education and Special Education.

6. A student must have an average of *C* or better in an area of specialization.

The curriculums leading to the degrees are designed to be completed in four academic years. A student who is willing and able to carry heavier loads successfully or to attend four quarters annually, may finish in less time.

R.O.T.C. students are allowed certain modifications of the requirements, as explained in the General Requirements and Regulations section.

MAJORS IN TEACHER EDUCATION

1. Elementary Education
   (if working for El. Cert. only)
2. Elementary—KP
   (if working for both El. and Kindergarten Certificates)
3. Elementary—EMR
   (if working for both El. and Educable Mentally Retarded)
4. Elementary—LD/BD
   (if working for both El. and LD/BD certifcates).
5. Special Education—EMR
   (if working toward a major in special education and certification in the field of the educable mentally retarded)
6. Secondary
   (use the word Secondary followed by the teaching field major. THUS—
   Secondary—English or
   Secondary—Math., etc.)
7. Secondary—EMR
   (the term EMR may follow if also working for Educable Mentally Retarded certification. THUS—
   Secondary—English—EMR.)
8. Special Subject
   (Secondary Education—
   subject field—special certificate)

Please note that other combinations of designation of major are possible, (e.g., Secondary English—LD/BD or Special Education — EMR-LD/BD.

These designations are based on the certification area(s) which the student is seeking.

PLEASE BE CONSISTENT WHEN DESIGNATING MAJOR.

REQUIREMENTS FOR ADMISSION

The teaching candidate in the University must exhibit better than average grades in all courses, and a capacity for successful tests. The student must complete at least 90 quarter hours of college work with a grade point average of at least 2.40. Upon recommendation of the department chairman, a student may be admitted on probation with a G.P.A. of not less than 2.25. In addition, competence in written and spoken English is required for each candidate in order to qualify for Upper Division status in the School of Education. English competence may be shown by a satisfactory score on a standardized English test, or by satisfactory completion of a three-hour course in English proficiency.

Education 501, Introduction to Education, includes a thorough discussion of requirements for admission to the School of Education, and issues relating to certification. Therefore, this course should be taken during the student's freshman year. A grade of "C" or better is required for this course. It is a prerequisite to any other course in education unless waived by the Dean of the School of Education.

Admission to the University does not guarantee admission to the School of Education or to candidacy for a teaching certificate. The student must apply for admission to Upper Division status in the School of Education. The student must apply for Upper Division status in the School of Education upon the accumulation of 90 quarter hours of Lower Division credit. This application is submitted through the office of the Assistant Dean, School of Education. Approval grants permission to enroll in Upper Division education courses.* Before approval to take Upper Division courses is given, the student is enrolled in the appropriate school, in accordance with the degree or special area involved as follows:

All B.S. in Education candidates are enrolled in the School of Education, regardless of major. Candidates for A.B. or B.S. degrees are enrolled in the College of Arts and Sciences, but must also be admitted to Upper Division status in the School of Education. B. Mus., B.S. in B.A., or B.E. degree candidates are enrolled in the schools awarding the respective degrees, but must be ap-

proved for Upper Division status in the School of Education in order to earn a teaching certificate. Requirements for admission to Upper Division status in the School of Education should normally be met by the end of the sophomore year. Later qualification for such status does not constitute justification for waiving any course prerequisites or planned sequences, and will almost certainly result in prolongation of the preparatory period beyond the normal four years.

With few exceptions, the candidate for the provisional high school certificate must complete the requirements for a major in at least one teaching field; the student may prepare for additional teaching fields either as minors or majors. The student should observe carefully the requirements in the various fields as stated in pamphlets available from the School of Education.

An undergraduate transfer student may be admitted to the School of Education if in good standing in the teacher education program at the previous school, or could have been admitted to the teacher education program, provided that the former school is NCATE-approved. If the institution is not NCATE-approved, the grade point average on the work transferred must meet YSU School of Education admissions requirements. If the grade point average does not meet YSU requirements, the student must earn at least a 2.25 on at least 15 quarter hours of YSU work before being considered for admission to the Youngstown State University School of Education.

REQUIREMENTS FOR STUDENT TEACHING

Application to be assigned to student teaching should be filed with the Student Teaching Office by March 1 of the year preceding the academic year in which student teaching is to be completed. The student must register for the the proper number of hours to the respective student teaching course(s) during the open registration period preceding the quarter in which student teaching is to be experienced. Students anticipating more than one teaching certificate will need to register for more than one student teaching course. To qualify for assignment to student teaching the student must have: a) senior status; b) a G.P.A. of 2.4; c) completed prescribed prerequisites for student teaching and d) an average of 2.67 ("D" grades excluded) in the major/certification area with the course sequence substantially completed.

*Students in other schools may elect Education 708, 873, 874, or 879 with the permission of the School of Education.

REQUIREMENTS FOR CERTIFICATION

Initial Certification. The Dean of the School of Education has the authority to recommend to the State Board of Education all Youngstown State University graduates who qualify for certification in any education program offered by the University. The degrees earned in the School of Education will fulfill certification requirements for kindergarten, primary, elementary, and secondary teaching certification. Students earning degrees in schools other than the School of Education must complete all requirements of the Teacher Education Program in order to be certified. Students may qualify for a four-year provisional certificate in: elementary, secondary, and special fields. All candidates for any teaching certificate must meet the requirements for admission to Upper Division status in the School of Education, but the degree earned may be conferred by any of the University schools or colleges in accordance with the specific requirements for the degree desired. However an undergraduate grade point average of 2.40 must have been obtained if the student is to be recommended for certification by Youngstown State University irrespective of the type of degree received.

Some detailed information pertaining to certification is as follows:

1. The candidate for the elementary certificate may also be certified in kindergarten, EMR, LD/BD, reading or educational media on completion of the appropriate course sequence.

2. The candidate for the secondary education certificate must major in a subject matter teaching field. Additional fields may be added if the required number of hours for certification have been completed.

3. Special subject field candidates are certified to teach the subject appearing on the certificate in grades kindergarten through 12, unless otherwise noted on the certificate or stated in the laws and regulations governing certification. The special subject fields are: visual art, health education, languages, music and physical education.

4. Teaching certificates are processed by the Academic Advisors in the School of Education. The application form is available in the Office of the Assistant Dean of the

School of Education. The student must file an application by the beginning of the quarter in which the requirements are to be completed.

ADVISEMENT

All prospective teachers are advised by the faculty of the school and department in which their major is located; e.g.:

2. Secondary education candidates, and candidates in the special certification fields of art, music, health education, and physical education, are advised at all times by faculty members in their major departments; in addition, after they have been admitted to Upper Division status in the School of Education, they will be assigned advisors in the School of Education who will be responsible for questions dealing with certification and professional education courses.

The student whose needs are not completely met by existing conventional programs may wish to investigate and apply for the Individualized Curriculum Program (see General Requirements and Regulations).

COURSES OF INSTRUCTION AND CURRICULUMS

Each curriculum leads to an Ohio State Provisional Certificate. Minimum requirements for teachers' certificates are determined by the Ohio Department of Education; if those requirements change, they become effective immediately at Youngstown State University. State Department minimal requirements may be and usually are exceeded by University requirements.

ELEMENTARY EDUCATION

Professors Ameduri, Braden, Chrisp, Roderick, and Vanaman; Associate Professors Nichols, Scott, Snozek (chairman), and Steele; Assistant Professors Throop and Tribble.

The curriculum in elementary education at Youngstown State University is a four-year program.

The student who wishes to qualify for a Bachelor of Science in Education degree in elementary education enrolls in the School of Education. All elementary education students are advised by an advisor in the Office of the Assistant Dean of the School of Education. The advisor is available for advising and counseling students concerning the courses essential for admission to professional education course status. Upon satisfactory completion of two years of general course requirements at the required level of academic proficiency and upon the demonstration of satisfactory competence in English, the student is granted Professional Education Course Status in the School of Education. Such status must be granted before qualifying courses for certification may be taken.

Teacher Education Center. A junior level student may apply for participation in a Teacher Education Center (TEC) held in a local school, taking a block of required methods courses. The student is required to spend the entire day in the school for ten weeks where a team of university faculty presents theory and supervises the teaching of lessons. Applications may be obtained from the Department of Elementary Education.

Lower Division Courses

510. *Reading and Study Skills.* Development of college reading, vocabulary, comprehension, and study skills which aid in academic achievement. Includes laboratory experience. 3 q.h.

612. *Reading Laboratory.* Designed for adult readers who wish to improve their reading rates, skills, comprehension, vocabulary, and study skills. Emphasis will be on the reading of technical materials and the utilization of contemporary reading machines to increase speed in reading. 3 q.h.

630. *Pre-school Curriculum.* Organization and administration of the educational program of the nursery school. Particular attention given to curriculum and program planning. 3 q.h.

Upper Division courses

(Open only to students who have been admitted to Upper Divison status in the school of Education.)

705. *Professional Laboratory Experiences: Elementary.* Observational and participatory experiences in actual elementary school situations under the direction of regular school teachers and administrative personnel. Students work as "teachers' aides" in assigned schools for one full school day (or two half-days) each week. Minimum time must be at least six hours weekly, but the full school time involved in two half-day or one full-day schedules must be met even if it exceeds six hours. In addition one hour of campus conference is required weekly. Course should be scheduled during the quarter following admission to Upper Division status in the School of

Education and should precede the basic methods courses. Required of all regular elementary candidates. Prereq.: Admission to Upper Division in the School of Education or consent of the Dean of the School of Education. 3 q.h.

713. *The Teaching of Arithmetic.* Principles and content in the learning of elementary school mathematics and their application to its effective teaching. Required of all elementary candidates. 3 q.h.

714. *The Teaching of Social Sciences in the Elementary School.* An introduction to the "New Social Studies" investigating its rationale, methods, materials, and the acquisition of the supportive instructional strategies and knowledges required of the classroom teacher. Required of all elementary candidates. 3 q.h.

715. *The Teaching of Science in the Elementary School.* Principles in the learning of science and their application to effective teaching. Required of all elementary candidates. 3 q.h.

723. *Career Education-Elementary School.* A study of the philosophy and objectives of elementary career education curriculum, with emphasis on a review of the state Department of Vocational Education's World of Work model programs, kindergarten through grade 6. Students will be required to spend a portion of class time observing the World of Work program in a school setting. An examination of how World of Work is integrated in social studies education will be conducted. The development of simulation games and individualized learning materials relevant to the World of Work curriculum may be required. May be applied to the Social Studies elementary concentration area. 3 q.h.

801. *Purposes and Practices of the Elementary School.* An analysis of current education, its aims, its sources, its strengths, and weaknesses. Current practices are traced to their contributors, with the focus on the means by which modern education promotes the growth of the whole child in a democratic society. 3 q.h.

812. *Language Arts I.* The principles and methods of teaching reading in the elementary school. 3 q.h.

813. *Language Arts II.* Teaching oral and written communication through consideration of listening, speaking, handwriting, spelling, creative and formal writing in the elementary school. 3 q.h.

814. *Language Arts III.* An advanced, in-depth course in unconventional teaching strategies with emphasis on non-book approaches. May include field experiences. Prereq.: Ed. 812 or consent of instructor. 3 q.h.

815. *Seminar in Elementary School Science.* A critical study of current developments in objectives, methods, materials, and evaluation in science education as they affect the elementary science program. The course will include discussions, field trips, demonstrations, and laboratory work. This course may be used as an elective. Prereq.: Ed. 715. 3 q.h.

816. *Diagnosis and Remediation of Elementary School Mathematics.* An in-depth study of diagnosis and remediation as it affects the elementary school mathematics program. It will include discussions, field trips, demonstrations, and laboratory work. Applicable to undergraduate and graduate programs. Prereq.: Ed. 713. 3 q.h.

830. *Early Childhood Education: Part I.* The first in a series of three courses designed to prepare the student for teaching children, pre-school and K-3. A study of the historical, philosophical, sociological and psychological implications of early childhood education. 3 q.h.

831. *Early Childhood Education: Part II.* The second in a series of three courses designed to prepare the student for teaching children, pre-school and K-3. Required for a Kindergarten-Primary certificate. Preparation of a workable environment for the young child with emphasis on his physical, mental and social characteristics. 3 q.h.

832. *Early Childhood Education: Part III.* The last in a series of three courses designed to prepare the student for teaching children pre-school, K-3. A study of teaching procedures, methods, and materials used on the kindergarten level. Areas of curricular investigation include social studies, science, language arts, numbers, and music. 3 q.h.

841. *Supervised Student Teaching: Elementary.* Prereq.: Educ. 705, 713, 812, 813, senior status and approval of the chairman of the Elementary Education Department. 1-15 q.h.

881. *Corrective Techniques in Reading.* A basic course in corrective reading for classroom teachers. Emphasis on the administration and interpretation of group tests and the evaluation and correction of

reading difficulties. 4 q.h.

882. *Developmental and Content Area Reading.* A study of the development of comprehension skills, word attack skills, study skills, and related problems in the content areas from kindergarten through grade 12. Prereq.: Consent ot the instructor. 3 q.h.

884. *Reading Internship.* Supervised experience in reading diagnosis and instruction, including both developmental and remedial pupils, in area schools. Students will teach for two half-days a week in the school reading centers. A two-hour seminar will meet on campus once a week. Prereq.: Ed. 882 and consent of instructor. 4 q.h.

890. *Elementary Education Workshop.* A workshop which provides intensive study and related activity in one of the following elementary curricular areas: arithmetic, science, reading, social studies, or language arts. 1-4 q.h.

894. *Audio-Visual Media.* A synthesis of the theory, practice, and values of communicating with audio-visual media. Demonstrations utilizing filmstrips, slides, audio tapes, overhead transparencies, motion pictures, opaque visuals, graphics, models, displays, and closed circuit television. Laboratory experiences in the preparation of materials and the use of modern media in teaching. 4 q.h.

895. *Cataloging & Classification.* A study of the basic structure of the Dewey Decimal and the Library of Congress classification systems and their use in making books accessible in the school library. Organization and arrangement of the card catalog and forms of entry for various types of printed and audio-visual materials. Cross-listing: Secondary Education 895. Prereq.: Education 894. 4 q.h.

896. *Reference.* A general survey of reference tools especially appropriate to school libraries; such as encyclopedias, periodical indexes and subject area guides in science, social studies, mathematics, language arts, etc. Cross-listing: Secondary Education 896. Prereq.: Education 894. 4 q.h.

897. *Media Center Administration.* Consideration of practical problems in establishing, organizing, and directing a school media center. Location and arrangement of facilities, staffing, scheduling, material selection policies, ordering and processing routines and related problems. The relationship between the media center and the classroom in developing a program to supplement and enrich the curriculum. Cross-listing: Secondary Education 897. Prereq.: Education 894. 4 q.h.

898. *Preparation of Audio-Visual Materials.* Demonstrations and practical experience in the preparation of graphic materials, diazo transparencies, 35 mm slides, filmstrips, audio tapes, and 8 mm films. Cross-listing: Secondary Education 898. Prereq.: Education 894. 4 q.h.

Elementary Education Curriculum

Changes in requirements for elementary education are being developed. The student is obligated to keep in touch with the advisor in order to know of these changes.

CURRICULUM FOR THE BACHELOR OF SCIENCE IN EDUCATION DEGREE WITH THE MAJOR IN ELEMENTARY EDUCATION

First Year	Hrs.
English 550, 551	8
Speech 554	4
Geography 502	4
History 605 or 606	4
History 655 or 656	4
Biology 505	4
Math 515, 516	9
HPE 590	3
Music 521	3
Education 501	3
HPE Activity	1
	47
Education 502 (if required)	3

Second Year	Hrs.
English 650, 708	9
History 661, 662, 663, 611	4
Physical Science	4
Science elective	4
Psychology 601	5
Social Studies electives	6-7
Music 621	4
Humanities	4
HPE 622	1
Electives in Specialization Area	8
	49-50

Third and Fourth Years

Professional Education Courses:

	Hrs.
Education 705 - prerequisite to all Professional Education courses	3
Education 708, 710, 713, 714, 715, 801, 812, 813	26
Education 841 (prerequisites 705, 713, 812, 813)	15

Education 830, 831, 832 (if K-P certification desired)	9

General Education Courses:

	Hrs.
Speech 705	3
HPE 721, 722	7
HPE Activity	1
Music 721	3
Art 760	4
Psychology 755	4
Electives in Specialization Area	5-17

Electives to complete 186-189 quarter hours.

Electives may be taken at any time throughout the four years.

Possible Specialization Areas For Elementary Education

All students majoring in elementary education must complete the requirements in one of the following areas of specialization: (1) English; (2) fine arts; (3) foreign language; (4) health and physical education; (5) language arts; (6) mathematics; (7) media specialist; (8) reading validation, science; (9) social studies.

1. *English.* Forty-five (45) q.h. required, including English 550, 551, 650, 708, Speech 554 and 705. Twenty-one (21) additional q.h. of English, including at least one Upper Division course are required.
2. *Fine Arts.* Thirty-six (36) q.h. required unless Music 521 is waived. Art 760, 767, and Music 521, 621, 721 (total of 16 hours) are a part of the elementary education program. An additional 20 q.h. are required and must include Art (Music) 709, 710, 711, 12 q.h. Philospohy 710, Aesthetics, 4 q.h. may be included.
3. *Foreign Language.* Must total 36 q.h. all in the *same* language. Twenty-four (24) q.h. in one foreign language if the student has two high school credits in the *same* language. In all other cases the student must first take 12 q.h. of elementary language and then take 24 additional q.h. all in the same language.
4. *Health and Physical Education.* A total of 34 q.h. are required. Thirteen (13) are general requirements for graduation and certification. The following courses will be accepted for use as a concentration area: HPE 501R, 502R, 503R, 504R, 506R, 516R, 530R, 531R, 540R, 545R, 601, 690, 762, 763, 780, 790, 791, 792, 793, 797, 880.
5. *Language Arts.* Required courses are Comp. 550, 551; Speech 554, 705; English 650, 708; Education 812, 813, 814, 881, 882. Twelve additional quarter hours are required and must be selected from the following: Education 825, 894, 896; Art 822; Speech 760; English 709, 710.
6. *Mathematics.* Must total 28 q.h. Eighteen (18) additional q.h. of mathematics are required. Required courses are Math 617, 618 (5 and 4 or 9 q.h.). Elective courses are Math 540, 542, 550.
7. *Media Specialist.* Thirty-two (32) q.h. are required, including English 708. Other requirements are English 709 and 710, Education 894, 895, 896, 897, and 898.
8. *Reading Validation (K-12).* Required courses are Comp. 550, 551; Speech 554, 705; English 650, 708; Education 812, 813, 881, 882, 883, 884.
9. *Science.* Must total 36 q.h. Twenty-four (24) additional q.h. of science are required. Additional mathematics courses beyond Math 515 and 516 may be substituted for not more than five of these 24 *additional* q.h. Students selecting this concentration area may take courses in astronomy, biology, chemistry, geology, physical geography and physics.
10. *Social Studies.* Must total 45 q.h. Eighteen (18) additional q.h. are required. The *additional* hours may be taken in history, geography, sociology, economics, or political science. The *additional* hours may be all in one area or in any combination of areas.

Education 723 may also be used for social studies concentration area.

FOUNDATIONS OF EDUCATION

Professor Swan; Associate Professors Baldino (Chairperson), Beckett, Haims, Kirschner, Leck, Pascale and Watkins; Assistant Professor Heym.

Lower Division Courses

501. *Introduction to Education.* Designed to offer students a common core of experiences facilitating learning about schools, their functioning and their various programs. Examination of requirements for admission to the School of Education, issues relating to certification, and some basic principles and issues in the economic, historical, sociological, and philosophical foundations of Ameri-

can schooling. Ten hours of field experiences are required. Prerequisite for any other course in education unless waived by the Dean of the School of Education. 3 q.h.

502. *English for Proficiency.* A course for prospective teachers who need improvement in English usage. This course is required on all programs leading to teacher certification, unless waived on the basis of a suitable score on an approved standardized test. This course counts toward a student's grade point average, but does *not* count as credits for graduation. 3 q.h.

Upper Division Courses

Students who have not been admitted to Upper Division status in the School of Education, or who are not working toward teacher certification may be admitted to Education 708, 710, 872, 873, 875, 876, 877, 879 or 899.

708. *Education and Society.* The school as an interactive institution. Examination of interactions of home, religion, state, economic and cultural norms with schooling plans, problems and procedures. A field experience of 24 hours is required to aid students in further development of an understanding of the effects and functions of formalizing education in American society. Required of all candidates for teaching certificates. 4 q.h.

710. *Educational Measurement and Guidance.* Construction, administration, scoring, and interpreting of objective examinations; selection and administration of standardized tests and scales, and their use in vocational and educational guidance. Required of all candidates for teaching certificates. 4 q.h.

870. *Problems of the Classroom Teacher.* Adjustment of teaching surroundings; seeking practical and acceptable solutions to problems through rethinking of philosophy, instructional methods, and ethics; the professional, legal, and social status of the teacher; teacher-pupil relations, and other problems. 3 q.h.

871. *Pupils' Problems.* The problems of school routine, such as discipline, attendance, public school delinquency, child labor, and school-parent relationship; practical cases. Social agencies as auxiliaries to the school program. 3 q.h.

872. *Statistical Methods in Education.* An introductory course in frequency distributions, measure of central tendency, measure of variability, calculation and meaning of percentiles, the normal curve, reliability and validity of measures and simple correlation. 3 q.h.

873. *Comparative Education.* A survey of the national school systems of selected foreign countries to facilitate comparisons with the U.S. structure. 3 q.h.

875, 876, 877. *Seminar in Foundations of Education.* Various topics of current interest in the Foundations area selected by the staff. 1-4 q.h. each, maximum 15 q.h.

879. *Educational Sociology Seminar.* Students will be required to participate in an extensive field project designed to give them an understanding of minority groups in our population and their cultures. This field experience coupled with seminar sessions will be the basis for a written paper. 2-4 q.h.

880. *Inner-City Educational Workshop.* A survey of some of the more creative and innovative approaches being used in inner-city schools; lectures, discussions, visual aids; nationally recognized experts in the field employed as consultants. A review of economic, social, and psychological forces which have changed our cities, and the educational implications thereof. A critical evaluation of personal attitudes which lead to prejudice, misunderstanding, and fear. Prereq.: Certificated teachers employed in inner-city schools. 3 q.h.

899. *The Community School.* The basic principles in the organization and administration of community school activities. Observations of community schools and their varied programs together with textual and research materials. The Flint Community Schools will receive particular attention. Open to nonmajors. 3 q.h.

GUIDANCE, COUNSELING AND PUPIL PERSONNEL

Professors DiRusso and DiGiulio, Associate Professors Cliness (chairman), Richards; Assistant Professors Convery, Feitler and Levitsky.

The department offers work towards the M.S. in Education degree with specialization in various pupil personnel services, visiting teacher, guidance, and counseling. Students may qualify for State certification in: elementary counseling, secondary counseling, and visiting teacher. A complete listing of program and course descriptions is presented in the YSU Graduate School Catalog.

The Guidance Department offers a limited number of undergraduate elective courses for students planning to become teachers or counselors.

Upper Division Courses

761. *Human Relations and Guidance Skills for Teachers.* Approaches to improving the interpersonal aspects of the learning climate within the classroom. Primary focus is upon facilitating mutual acceptance and understanding among students and teachers, but consideration is given also to amelioration and prevention of behavior problems. Prereq.: Ed 705 3 q.h.

821, 822. *Seminar in Guidance and Counseling,* Study of selected topics chosen by staff, e.g.: career guidance, counseling process, and other contemporary issues in school personnel work. Maximum 12 quarter hours. 1-4 q.h.

823. *Career Education and Career Guidance.* Study of public school career education and career guidance programs; the career education continuum, legislation relating to vocational programs, structures of vocational school programs, historical development, and principles of vocational education and vocational guidance. Also a survey of concomitant services: distributive education, manpower programs, and placement. 3 q.h.

825. *Group Processes in the School.* An introduction to group activities applicable to the needs of students in the school setting. This would include a study of group processes and group dynamics for social and personal problem solving as well as in the general area of individual and group behavior. Also, a study of programs that provide for counselor-teacher cooperation in the development of groups in the classroom. 3 q.h.

SECONDARY EDUCATION

Professors Cobett, Douglass, Hill (Chairman), McCracken, Philipp, Sample, and Solak; Associate Professors Babisch, Boggess, Feldmiller, Knauf, Liptak, Longmuir, and Phillips; Assistant Professors Connelly, Feitler, and Salvner; Instructor Haushalter.

Youngstown State University offers courses leading to high school certification in many fields. Courses and advisors for the major are provided by the Arts and Sciences College department of the same name except in the fields of data processing, driver education, reading, educational media, and science comprehensive, for which advisement is provided entirely by the School of Education.

Similarly, the School of Education assumes full responsibility for advisement and approval of matters dealing with certification requirements (regardless of the degree involved) and for graduation requirements for the Bachelor of Science in Education degree.

With few exceptions, secondary education graduates must major in a *teaching field.* The required professional education courses are designed to meet minimal Ohio State requirements for certification and do satisfy the minor field for graduation but *do not constitute a major* for graduation purposes. They may be expanded into a major upon approval of the chairman of the Department of Secondary Education and the Dean of the School of Education.

Professional courses in secondary education are normally available as regularly conducted campus courses requiring certain sequences and extending over a minimum of four to six quarters. Some modification of the sequential requirement may be anticipated by qualified postgraduate students seeking certification only. Such students enroll in the School of Education regardless of degree held or previous major. The Department of Secondary Education is also conducting some experimental programs in conjunction with cooperating school districts, whereby interested students may complete most of the professional course sequence (including student teaching) in two consecutive full-time professional quarters. These programs operate off-campus, usually require the full-time attendance of participating students at the cooperating school and usually (although not always) preclude scheduling other than education courses during this period. The number of students who can be accepted in such programs is limited and interested individuals should seek information in advance from the department chairman.

Since State requirements in teaching fields are frequently lower in credit hours than the University requirements for a major, it is possible to expand teaching field credentials by adding to the major area certain other minimal preparation areas. Such areas are referred to below as "Additional Teaching Fields" and may supplement the major but not substitute for it. Availability of the teaching areas as majors or Additional Fields, or both, is indicated below.

Teaching Fields

Art (Major for Special Certificate, grades K-

12). For requirements see Department of Art, College of Fine and Performing Arts.

Art (Major for High School Teaching or Additional Teaching Field). For requirements see Department of Art, College of Fine and Performing Arts.

Biological Science (Major) Chem. 515, 516, 517 (12 q.h.) required but hours not included for major. Biol. 506, 507, 508 (12 q.h.), *electives (41 q.h.). Total 53 q.h. The following are required of biology majors working for a B.S. degree and are recommended for those working for an A.B. or B.S. in Ed. degree. They are not counted in the 53 q.h. Chem. 719, 720, 721, Phys. 501, 502, 502L, 503, 503L, Math. 550, 714. Special Methods, Ed. 800G.

Biological Science (Additional Teaching Field) Biol. 506, 507, 508 (12 q.h.), **electives (18 q.h.). Total 30 q.h.

Bookkeeping—Basic Business (Additional Teaching Field for Accounting or General Business Major, School of Business Administration) Acctg. 605, 606, BET 710, 850, Econ. 520, Mgmt. 715 (23 q.h.), electives (10 q.h.) including (5 q.h.) in accounting. Electives to be approved by advisor.

BUSINESS EDUCATION COMPREHENSIVE (Major only) Business Education and Technology 510, 513, 522, 614, 615, 620, 704, 706, 710, 718, 810, 850, Acctg. 605, 606, Econ. 520, 622, Finance 600 (54 q.h.). Any substitutions require permission of Business Education and Technology chairman, and/or the chairman of the Department of Secondary Education. Students who plan to teach shorthand must take BE&T 630, 631, and 830. Students who do not plan to teach shorthand must take 10 additional hours selected from electives. Electives (18 q.h. to be approved by department chairman) from the following areas: BE&T 621, 622, 720, 730, 731, 740, 805, 820, 851, 860, Acctg. 701, 702, 713, 714, Adver. 631, 632, Econ. 621, 704, Finance 720, 724, Geog. 519, Mgmt. 511, 725, 804, Mktg. 624, 625, Math. 452, Pub. Rel. 710, Speech 652, 655.

Chemistry (Major) Chem. 515, 516, 517, 603, 604, 719, 720, 721, 739, 740, 741, 729 (49 q.h.). Check catalog for mathematics and physics prerequisities. Special Methods, Ed. 800G.

Chemistry (Additional Teaching Field) Chem. 515, 516, 517, 603, 604, 719, 720, 721 (34 q.h.).

**The electives are listed under major, above.

Communication Comprehensive (Major only, English or Speech) 90 q.h. minimum are required in the content fields. The candidate may major in English or speech and complete the additional content requirements as indicated below. Alternative courses in the same department may be substituted in the concentration areas and journalism upon approval of the chairman of the department in which the course is offered. Minimum course distribution: major in English or speech (45 q.h. English, 46 q.h. speech), concentration in English for speech major (27 q.h.), concentration in speech for English major (30 q.h.), journalism (15 q.h.), reading (7 q.h.). Total 97 q.h. (English); 95 q.h. (speech). If major is English, the speech concentration should be: Speech 554, 603 (6 q.h.), Speech 560, 750 or 751 (8 q.h.), Speech 561 (4 q.h.), two of the following: Speech 654, 658, 815 (8 q.h.), and Speech 661 (4 q.h.). Total 30 q.h. If major is speech, the English concentration should be: Engl. 610 (4 q.h.), Engl. 611 or 612 (4 q.h.), Engl. 613 or 614 (4 q.h.), Engl. 650 (5 q.h.), and electives in Upper Division English, 760 or above, (10 q.h.). Total 27 q.h. journalism: Engl. 715, 716 (8 q.h.), one of the following: Engl. 721L, 722L, 723L (3 q.h.), Engl. 815 (4 q.h.). Total 15 q.h. Reading: Ed. 882, 883 (7 q.h.). Methods should be Ed. 800E.

Data Processing (Additional Teaching Field only). Advisement is in Department of Secondary Education. (Option 1. Mathematics) Comp. Sci. 600, 601 (9 q.h.). (Option II, Accounting) Acctg. 710 (3 q.h.), BET 710 (3 q.h.), Comp. Tech. 502 (3 q.h.). (Option III, Industrial Engineering) Ind. Eng. 642, 827 (9 q.h.). (Option IV, College of Applied Science and Technology) Comp. Tech. 502, 601, 607 (11 q.h.).

Driver Education. (Additional Teaching Field only, Department of Secondary Education) Ed. 750, 751 (9 q.h.).

*The elective(s) may be any courses applicable to the major. Suggested are Biol. 662, 663, 701, 721, 762, 770, 771, 775, 780, 790.

Earth Science (Major*) Astron. 504, 608, Biol. 506, Chem. 515, Geog. 625, Geol. 505, 506, 602, 604, 607, 701, 705, 811, and six quarter hours of any of the following: Geol. 694, 702, 703, 706, 801, 805. Physics 501, 502 (71 q.h.). Special Methods, Ed. 800G.

Earth Science (Additional Teaching Field*) Astron. 504, Geog. 625, Geol. 505, 506, 602, 604, 607, 701, 705 (30 q.h.).

Economics (Major) Econ. 520, 621, 622,

701, 704, 705, 706, 709, 710, 712, 802, 811 (44 q.h.). Hist. 715 or 716 (4 q.h.) Special Methods, Ed. 800S.

Economics (Additional Teaching Field) Econ. 520, 621, 622, 701, 712, 802, 811 (25 q.h.), Upper Division electives in economics (3-4 q.h.). Hist. 715 or 716 (4 q.h.).

Educational Media (Major for Special Certificate, grades K-12) Educ. 501, 502 (if needed), 704, 706, 708, 710, 800, 894, 895, 896, 897, 898 (43 q.h.), Educ. 847 Media K-12 (9-15 q.h.), Engl. 708, 709, 710 (12 q.h.). All other University requirements for the B.S. in Ed. degree plus additional certification requirements must be met.

Educational Media (Additional Teaching Field only, Department of Secondary Education), Engl. 708, 709, 710, Ed. 894, 895, 896, 897, 898 (32 q.h.).

English (Major only) All English majors must write a long satisfactory critical paper in an Upper Division literature course and the student must be sure that the professor has recorded this fact in the student's file in the English office. Lower Division courses: Engl. 611 or 612 or 613 or 614, 4 q.h. minimum. English majors should take at least one survey course, but no more than two are recommended. Upper Division courses: two Upper Division literature courses are required in any one of the three course areas (Engl. Lit. I, Engl. Lit. II and Amer. Lit.)—in which a survey course has not been taken. All students must take at least three Upper Division literature courses. (In addition to courses in English and American literature, students seeking certification must have course work in world literature.), 11 q.h. minimum. Linguistics: Engl. 755 (5 q.h.), Engl. 757 or 758 (5 q.h.), Advanced Composition: one course from any of the following: Engl. 715, 740, 746, 747 (3 or 4 q.h.). Required 45 q.h. of the above plus Ed. 883 (4 q.h.). Special Methods, Ed. 800E. Total 49 q.h. beyond the composition requirement.

French (Major only) 45 q.h. in college above the elementary level (i.e., two years of French in high school or 501, 502, 503 in college). Suggested sequence: 601, or any two different French 601 2-q.h. courses (unless the student had three years of French in high school, 602, or any two different French 602 2-q.h. courses (unless the student had four years of French in high school), 655, 615, 675, 705, 706, 771, 772, plus electives in 800-level courses and/or 755, 756. Phonetics 869 is strongly recommended. Special Methods should be Ed. 800L.

General Science (Additional Teaching Field only) Biol. 506, 507; Chem. 501, 502; Geol. 807, 808, 809 or 505, 506, 607; Phys. 501, 502 (32 or 35 q.h.). Special Methods, Ed. 800G.

Geography (Major) Consists of a minimum of 45 q.h., of which at least 30 q.h. must be earned in Upper Division courses. Science requirements should be met by Geol. 505 and 506. Econ. 704, 705, 706 are strongly recommended. Other acceptable Upper Division electives are dependent upon the student's area of interest. At least two courses must be selected from each of the three following groups: (Group A) Geog. 502, 603, 625, 730, 805, Geol. 701; (Group B) Geog. 626, 722, 723, 725, 731, 808, 813; (Group C) Geog. 519, 627, 712, 713, 714, 716, 717, 719, 720, 724, 726, 800, 809, Geol. 703. Special Methods, Ed. 800G.

Geography (Additional Teaching Field) Requires a minimum of 30 q.h., at least 12 q.h. being earned in Upper Division courses. At least two courses must be selected from each groups A, B, C as listed in the major above.

German (Major only) 45 q.h. in college above the elementary level (i.e., two years of German in high school or 501, 502, 503 in college). Suggested sequence: any two different German 601 2-q.h. courses (unless the student had three years of German in high school), any two different German 602 2-q.h. courses (unless the student had four years of German in high school), 615, 618, 620, 707, 708, 709, plus electives in 800-level courses and/or 766, 767. Special Methods should be Ed. 800L.

Health Education (Major for Special Certificate, grades K-12) For requirements see Department of Health and Physical Education, College of Arts and Sciences.

Health Education (Additional Teaching Field, High School only) Area A: Biology 551, 552 (8 q.h.). Area B: HPE 680, 701, 794 (9 q.h.). Area C: HPE 601, 690, 790, 791 (14 q.h.). Area D: At least one of the following: Biology 504 or 721, Chemistry 501, HPE 892, Home Ec. 551, Psychology 707, 708, Sociology 705 (3-4 q.h.). HPE 590 and three activity credits are required but are not applicable to the minor.

History (Major only) 52 q.h. taken from the following groups: (Group A) Hist. 605, 606, 655, 656; (Group B) three courses from Hist. 701, 702, 704, 706, 708, 710, 712, 713, 715,

716, 717, 718, 720, 721, 723, 730, 731, 732, 733, 736, 738, 739, 741, 742, 743, 744, 745, 746, 747, 748, 749, 788, 801; (Group C) three courses from Hist. 735, 751, 752, 753, 754, 755, 758, 759, 760, 761, 765, 766, 767, 768, 769, 782, 783, 784, 786, 787, 790, 791, 792, 793, 795, 850, 851; (Group D) three courses from Hist. 611, 661, 662, 663, 770, 772, 775, 776, 777, 778, 779, 780, 781, 796, 797, 798, 799, 800, 811, 812, 813, 820, 821, 822, 860. Special Methods, Ed. 800S.

Home Economics (Major only) Home Econ. 503, 504, 549 or 550, 551, 551L, 601, 604, 652, 705, 706, 707, 762, 763, 770, 780, 800, 850, 852 (59 or 62 q.h.) Biol. 551, 552, 604, Chem. 501, 502, 503, (24 q.h.). In quarters when Home Econ. 800 is not offered, Ed. 800G may be substituted.

Italian (Major only) 45 q.h. in college above the elementary level (i.e., two years of Italian in high school or 501, 502, 503 in college). Suggested sequence: 601 (unless the student had three years of Italian in high school), 602 (unless the student had four years of Italian in high school), 705, 706, 718, 719, 729, 730, 731, plus electives in 800-level courses. Special Methods should be Ed. 800L.

Journalism (Additional Teaching Field only, English) Journ. or Engl. 715, 716, 721L, 722L, 723L, 815 (21 q.h.) electives (9 q.h.) from the following: Speech-Drama 682, Art 780 or repetition(s) of Journ. or Engl. 721L, 722L, 723L. Subject area advisor will be the Supervisor of Journalism in the English Department.

Latin (Major) 45 q.h. in college above the elementary level (i.e., two years of Latin in high school or 501, 502, 503 in college). Suggested sequence: 601 (unless the student had three years of Latin in high school), 602 (unless the student had four years of Latin in high school), 707, 708, 709, 804, 809, plus electives in 800-level Latin courses and/or other courses subject to the approval of the department chairman. The inclusion of Ancient Greek is recommended. Special Methods should be Ed. 800L.

Latin (Additional Teaching Field) 30 q.h. in college above the elementary level (i.e., two years of Latin in high school or 501, 502, 503 in college). Suggested sequence: 601 (unless the student had three years of Latin in high school), 602 (unless the student had four years of Latin in high school), 707, 708, 709, 804, 809, plus electives in 800-level Latin courses and/or other courses subject to the approval of the department chairman.

Mathematics (Major) Math. 571, 572, 673, 674, 701, 725, 727, 730 or 732, 743, 871 (43 q.h.), Com. Sci. 600 (4 q.h.), electives from 700- and 800-level courses (5 q.h.). Special Methods should be Ed. 800M or 800G.

Mathematics (Additional Teaching Field) Math. 571, 572, 673, 725 or 727, 730 or 732 (22 q.h.), electives (10 q.h.) selected from Math. 701, 725, 726, 727, 728, 740, 741, 742, 750 or other 700 or 800 Math. courses with approval of advisor.

Music (Major for Special Certificate for grades K-12, Bachelor of Music in the School of Music). For requirements see School of Music, College of Fine and Performing Arts.

Physical Education (Major for Special Certificate, grades K-12). For requirements see Department of Health and Physical Education, College of Arts and Sciences.

Physical Education (Additional Teaching Field, High School only) Biol. 551, 552, H&PE 501, 502, 506, 516, 545, 595, 601, 765, 780, 795, 850 (32 q.h.), electives, two additional activity courses (2 q.h.), at least four additional credit hours of non-activity course work.

Physics (Major) Phys. 510, 610, 610L, 611, 611L (14 q.h.), electives in physics (31 q.h.). This major does not apply to the B.S. degree but only to the A.B. or B.S. in Ed. degree. B.S. in Ed. candidates must take Chem. 515, 516 (8 q.h.). The following mathematics courses are prerequisite or concurrent for physics majors. Math. 571, 572, 673, 674, 705. Special Methods, Ed. 800G.

Physics (Additional Teaching Field) Phys. 510, 610, 610L, 611, 611L, 704, 704L, 705, 705L. Chem. 515, 516, (30 q.h.) Math. 571, 572 are prerequisites.

Political Science (Major) The major consists of 45 q.h. of which a minimum of 6 q.h. must be taken in each of the following areas: American government, comparative government, international relations, political theory. Special Methods, Ed. 800S.

Political Science (Additional Teaching Field) Pol. Sci. 601, 640, 660, 702, 704, 721, 722 (24 q.h.), Upper Division electives in political Science (6 q.h.).

Reading (Additional Teaching Field only, Department of Secondary Education) Ed.

*Astronomy and geology courses satisfy the science requirement for either A.B. or B.S. degree.

812, 881, 882, 883, 884 (18 q.h.).

Russian (Major only) 45 q.h. in college above the elementary level (i.e., two years of Russian in high school or 501, 502, 503 in college). Suggested sequence: 601 (unless the student had three years of Russian in high school), 602 (unless the student had four years of Russian in high school), 615 (or 604), 715, 716, 765, 770, 808, 809, plus electives in 800-level Russian courses and/or courses in Russian area studies subject to the approval of the department chairman. Special Methods should be Ed. 800L.

Sales-Communication (Advertising and Public Relations or Marketing Major, School of Business Administration or Additional Teaching Field) BET 521, 710, 850, Mgmt. 712, 713, Mktg. 624, 625, Speech 652 (25 q.h.), electives, 4 q.h., in marketing and 5 q.h. to be approved by advisor.

Science Comprehensive (Major only, advisement in School of Education) Astron. 504, 608 (8 q.h.), Biol. 506, 507, 508, 780, 790,(22 q.h.), Chem. 515, 516, 517, 603, 719, 720, 721 (29 q.h.), Geol. 505, 506, 602, 607, 701, 705 (22 q.h.), Physics sequence 501, 502, 502L, 503, 503L (12 q.h.) or Physics sequence 510, 610, 610L, 611, 611L (14 q.h.). Twelve q.h. of 700-800-electives must be taken to meet the University requirements of 60 q.h. of Upper Division work. Preferably this should be in the above areas. Special Methods, Ed. 800G.

Social Psychology (Major*) Psych. 601, 613, 615, 700, 702, 723, 755, 756, 800, 802, 845, (43 q.h.), elective (3 q.h.).

Social Psychology (Additional Teaching Field*) Psych. 601, 615, 700, 701 or 800, 709, 708, 756, 802, 845, (34-35 q.h.).

Social Studies Comprehensive (Major only, Department of Political and Social Science). The comprehensive certificate is valid for history (30 q.h.) and other social science fields below in which 18 q.h. have been completed. A minimum of 90 q.h. is required and at least two courses in each field below are required. The student should consult the University catalog under Social Studies to determine the difference between the certification program and the requirements for the major. (Economics, 18 q.h.), Soc. Sci. 502 (3 q.h.), Econ. 520, 621, 622 (9 q.h.), Upper Division electives (6 q.h.), (Geography, 18 q.h.) Geog. 502, 519 (8 q.h.), electives (10 q.h.). (History, 32 q.h.) Hist. 605, 606, 655, 656 (16 q.h.), any two of the following: Hist. 661, 662, 663, (8 q.h.), Upper Division electives (8 q.h.). (Political Science, 18 q.h.) Soc. Sci. 503 (3 q.h.), Pol. Sci. 601, 640 or 660 (8 q.h.)) 704, 722 (6 q.h.), electives to complete (18 q.h.). (Sociology, 18 q.h.) Sci. 501 (3 q.h.), Soc. 600, 700, 707 (15 q.h.). (Anthropology, 18 a.h.) Soc. 602, 711, 712, 714, 715 (19 q.h.). Special Methods, Ed. 800S.

Sociology (Major) Soc. 600, 701, 751, 760 (18 q.h.) plus 27 additional q.h. selected from the departments of General Sociology, Anthropology, and Social Services. These must include at least one course in each of these areas: Social Problems, Social Organization, Urban and Community Problems, and Family and Marriage. Selected courses from other departments may be added by permission of the department chairman. Comp. Sci. 600 may, in some cases, count toward the major. Special Methods, Ed. 800S.

Sociology (Additional Teaching Field) Soc. 600, 700, 705, 707, 743, 751, 760 (32 q.h.).

Spanish (Major only) 45 q.h. in college above the elementary level (i.e., two years of Spanish in high school or 501, 502, 503, *or 500 ABC* in college), including Spanish 705, 706, and 717. Suggested sequence: 601, *or any two different Spanish 601 2-q.h. courses* (unless the student had three years of Spanish in high school), 602, *or any two different Spanish 602 2-q.h. courses* (unless the student had four years of Spanish in high school), 615, 655, 705, 706, 717, 725, 726, plus electives in 700- and 800-level courses. Special Methods should be Ed. 800L.

Speech (Major for Special Certificate, K-12) Sixty (60) q.h., Fundamental Processes: Speech 554, 603, 604 (if recommended), 606 (10 q.h.), Theory and History of Speech: Speech 560, 750 or 751, 758 (12 q.h.), Forms of Speech: Speech 561, 653, two of the following: Speech 654, 658, 815 (8 q.h.), Speech 661, 670 (8 q.h.). Additional work in fundamental processes, theory and history, and laboratory experience as they apply to the elementary-age child. Courses needed to complete this section may be selected only *after* advisement with the Speech Communi-

*Ed. 710, Psych. 613 or any other basic course in basic descriptions statistics is a prerequisite for Psych. 615. Psych. 800 should be taken after all psychology courses except Psych. 845 with which it may be taken concurrently. Psych. 845 should be taken after completion of all other psychology courses or in the last quarter. The elective must be an Upper Division course applicable to the psychology major.

cation and Theatre Department. Required courses: Speech 760 (4 q.h.), Speech 898 (3-8 q.h.). After all requirements are met, electives may be drawn from the following: Speech 761, 764, 765, 852, 899. Special Methods, Ed. 800E or Ed. 800G.

Speech (Major for High School Teaching or Additional Teaching Field) Forty-five (45) q.h. are required for students seeking the Speech 7-12 certificate. Fundamental Processes: Speech 554, 603, 604 (if recommended), 606 (10 q.h.), Theory and History of Speech: Speech 560, 750 or 751, 758 (12 q.h.), Forms of Speech: Speech 561, 653 (7 q.h.), two of the following: Speech 654, 658, 815 (8 q.h.), Speech 661, 670 (8 q.h.). Total 45 q.h.

Stenography-Typing (Additional Teaching Field only) BET 521, 522, 620, 810, 630, 631, 730, 704, 510 or 805, 850, 830 (33 q.h.).

Typewriting (Additional Teaching Field only) BET 521, 522, 620, 621, 810 (10 q.h.).

Required Courses for a High School Provisional Certificate

Required courses for a high school provisional certificate are listed below. In addition to the major teaching field, additional teaching field (if chosen) and electives, the following courses are required: Ed. 501, 502[1], 704, 706, 708, 710[2], 800[3], 842 or equivalent[4] (35 q.h. including 710 but not 502), Psych. 501 or 601, 709 (7-9 q.h.), Engl. 550, 551 (8 q.h.), Speech 554 (3 q.h.), humanities[5] (8-18 q.h.), science and mathematics[6] (12-22 q.h.), social studies[7] (16-22 q.h.), H & PE 590 and three one-quarter-hour activity courses (6 q.h.)[8].

[1]May be omitted if satisfactory score is obtained on a standardized English test.

[2]This course is not required if a comparable course is included in teaching field.

[3]See 800G, *Special Methods* for differentiation. 800G may be taken where a methods course in the specific field is not offered.

[4]Equivalents in Student Teaching course and variability of quarter hours to satisfy certification areas are: Ed. 843. Supervised Student Teaching: Visual Art, gr. K-12; Ed. 844. Supervised Student Teaching: Music, gr. K-12; Ed. 845. Supervised Student Teaching: Health, gr. K-12; Ed. 846. Supervised Student Teaching: Physical Ed., gr. K-12. A student will register for 15 q.h. of student teaching in the secondary certificate area unless the certificate area is in combination with a special education certificate area. If a combination is sought, then the secondary area may be reduced to 9 q.h. and the special education area reduced to 6 q.h. as approved by the respective departments.

[5]Humanities. The candidate must have completed 8 q.h. in any of the following: Literature courses in English or humanities (600-level or above), courses in a literature in a foreign language (700-level or above), course work in the Department of Philosophy and Religious Studies, or history and/or appreciation courses in the Department of Art, Speech Communication and Theatre or the School of Music. For purposes of certification, at least one course in two of the following program areas is required: (1) fine arts, (2) philosophy, (3) theological studies.

[6]Astronomy, biology, chemistry, geology, physics, and mathematics to be taken in a minimum of two departments. One course must be in mathematics. A minimum of 8 q.h. must be in science, a maximum of 10 q.h. in mathematics.

[7]Social Studies (Department of Economics, Geography, History, Political Science, Psychology, Sociology/Anthropology) are to be taken in a minimum of two departments. Seven or nine q.h. of the 16 will have been taken in Psych. 501 or 601 and 709. The remainder should be in a field other than psychology.

[8]A combined total of 46 q.h. must be taken in humanities, science and mathematics, and social studies.

Upper Division Courses

(Open only to students who have been admitted to Upper Division status in the School of Education.)

704. *Professional Laboratory Experiences: High School.* Observational and participatory experiences under the direction of regular high school teachers and administrative personnel. Students work as "teachers' aides" in assigned schools for one full school day (or two half-days) each week. Minimum time must be at least six hours weekly, but the full school time involved in two half-days or one full-day must be met even if it exceeds six hours. In addition, one hour of campus conference is required weekly. Course should be scheduled during the first quarter following admission to the School of Education and should precede or be scheduled concurrently with Education 706. Required of all regular high school and special teaching certificate candidates. Prereq.: Admission to Upper Division status in the School of Education, consent of the Dean of the School of Education. 3 q.h.

706. *Principles of Teaching.* General methods of high school teaching: classroom procedures, methods utilized by superior teachers, attention to individual differences, measuring the results of teaching, planning the instruction. Required of all secondary and

special fields candidates. Prereq. or concurrent: Education 704. 3 q.h.

750. *Driver Education I.* A consideration of factors pertaining to driver and general traffic safety education. Required for certification of driver education teachers in Ohio. 4 q.h.

751. *Driver Education II.* Consideration of techniques, materials, organization, and evaluation of driver education programs. Includes laboratory experiences with driving simulators and road experiences. Required for certification of driver education teachers in Ohio. 5 q.h.

800G. *Special Methods.* Offered every quarter. A study of the problems involved in the teaching of different high school subjects. Each student specializes in the subject of his main interest. Observation of teaching in secondary schools, reports, and term paper may be required. Each student confers with the chairman of the department of his major teaching subject. (When possible, students should register in the special methods of their teaching field. Education 800B for Business Education will be offered fall and spring quarters. Education 800E for English will be offered winter and spring quarters. Education 800L for foreign languages will be offered in the winter quarter. Education 800M for mathematics will be offered in the winter quarter. Education 800S for social studies will be offered in fall and winter quarters.) This course is prerequisite to Education 842, Student Teaching. Prereq.: Education 706 and senior standing. 3 q.h.

842. *Supervised Student Teaching: High School.* Prereq.: Senior status and completion of Education 704, 706, and 800 or the equivalent methods course in the subject field; a grade average of at least *B* in two-thirds of the minimum subject field requirements for certification with no subject field course grade in the minimum requirements below *C;* and the approval of the chairman of the department of the student's major. 9-15 q.h.

843. *Supervised Student Teaching: Visual Art, grades* K-12. Prereq.: Education 704 and 706, Art 724 and 760, senior status and approval of the chairman of the Art Department. 9-15 q.h.

844. *Supervised Student Teaching: Music, grades* K-12. Prereq.: Education 704 and 706, Music 823, 824, 825; senior status and approval of the director, Dana School of Music. 9-15 q.h.

845. *Supervised Student Teaching: Health, grades K-12.* Prereq.: Education 704 and 706; HPE 701, 794, 796, and 892; senior status and approval of the chairman of the HPE Department. 9-15 q.h.

846. *Supervised Student Teaching: Physical Education, grades K-12.* Prereq.: Education 704 and 706; HPE 680, 700, 750 (men), 761, 762, 765, 780, 785 (women); senior status and approval of the chairman of the HPE Department. 9-15 q.h.

847. *Supervised Student Teaching: Educational Media, grades K-12.* Prereq.: Educ. 704, 706, 800 or equivalent; senior status and approval of the chairperson of Secondary Education Department. See Requirements for Student Teaching under School of Education. 15 q.h.

856. *Diagnosis and Treatment of Reading Disability: Part I.* Selection, administration, and scoring of various individual tests: techniques for evaluating the child with a reading disability. Prereq.: Consent of instructor and Education 882 or 883. 4 q.h.

857. *Diagnosis and Treatment of Reading Disabilities: Part II.* Instructional techniques and procedures for meeting specific needs of the child with reading disabilities. Work with specialized materials, machines, and other equipment used in reading improvement. Prereq.: Education 856 or consent of instructor. 4 q.h.

882. *Developmental and Content Area Reading.* A study of the development of comprehension skills, word attack skills, study skills, and related problems in the content areas from kindergarten through grade 12. Prereq.: Consent of instructor. 3 q.h.

883. *Secondary School Reading.* The teaching of reading in the secondary school. Survey of methods, materials, and programs. The course may include teaching experience in a school setting. This course meets the requirement in reading for certification in teaching English and may be applied toward validation of a high school certificate for teaching reading. 4 q.h.

884. *Internship in Reading.* Supervised experience in reading diagnosis and instruction, including both developmental and remedial pupils, in area schools. Students will teach for two half-days a week in the school reading centers. A two-hour seminar will meet on campus once a week. Prereq.: Education 882, 883, 856, 857 and consent of instructor. 4 q.h.

885. *Teaching Strategies I.* Improving teaching skills of elementary and secondary in-service and pre-service teachers. Emphasis is on clarifying and extending concepts. Prereq.: Consent of instructor or junior standing. 3 q.h.

886. *Teaching Strategies II.* Improving teaching skills of elementary and secondary in-service and pre-service teachers. Emphasis is on interpreting data, developing valid conclusions based on inference, and extending such conclusions to generalizations. Prereq.: Educ. 885. 3 q.h.

887. *Teaching Strageties III.* Improving teaching skills of elementary and secondary in-service and pre-service teachers. Emphasis is on helping students transfer or apply generalizations and learned knowledge to comparable situations. Prereq.: Educ. 886 3 q.h.

891, 892, 893. *Seminar in Secondary Education.* Various topics of current interest in the secondary education area as selected by the staff. Prereq.: Admission to Upper Division status in the School of Education or Graduate School. 1-4 q.h. (15 maximum)

894. *Audio-Visual Media.* A synthesis of the theory, practice, and values of communicating with audio-visual media. Demonstrations utilizing filmstrips, slides, audio-tapes, overhead transparencies, motion pictures, opaque visuals, graphics, models, displays, and closed circuit television. Laboratory experiences in the preparation of materials and the use of modern media in teaching. Prereq.: Upper Division or graduate status. 4 q.h.

895. *Cataloging and Classification.* A study of the basic structure of the Dewey Decimal and the Library of Congress classification systems and their use in making books accessible in the school library. Organization and arrangement of the card catalog and forms of entry for various types of printed and audio-visual materials. Prereq.: Education 894. 4 q.h.

896. *Reference (School Library).* A general survey of reference tools especially appropriate to school libraries; such as encyclopedias, periodical indexes, and subject area guides in science, social studies, mathematics, language arts, etc. Prereq.: Education 894. 4 q.h.

897. *Media Center Administration.* Consideration of practical problems in establishing, organizing, and directing a school media center. Location and arrangement of facilities, staffing, scheduling, materials selection policies, ordering and processing routines, and related problems. The relationship between the media center and the classroom in developing a program to supplement and enrich the curriculum. Prereq.: Education 894. 4 q.h.

898. *Preparation of Audio-Visual Materials.* Demonstrations and practical experiences in the preparation of graphic materials, diazo transparencies, 35 mm slides, filmstrips, audio tapes, video tapes, and 8 mm films. Prereq.: Education 894. 4 q.h.

SPECIAL EDUCATION

Associate Professors Dunsing (chairman), Hoops, Nickelsburg, and Smith.

The Department of Special Education currently offers two teacher certification programs, approved by the Ohio State Department of Education, for teachers of the Educable Mentally Retarded (EMR), and for teachers of children with Learning Disabilities and Behavior Disorders (LD/BD).

Either one or both of the certification areas may be elected within a four-year program of studies leading toward the Bachelor of Science in Education degree. All undergraduate special education students are served by Academic Advisors in the office of the Assistant Dean of Education. These Advisors are prepared to advise and counsel students concerning the requirements for their admission to "upper division status," at which time they become eligible to enroll in professional education courses.

Those students already possessing a bachelor's degree who wish to become certified in one of the special education programs should seek advisement from a faculty member within the department.

Special Education Programs

Educable Mentally Retarded (EMR). Mildly retarded individuals need programs stressing basic academic, independent living, and vocational skills. Professional educators in this field are widely sought, and may function as teachers, consultants, or supervisors.

Learning Disabilities and Behavior Disorders (LD/BD). Many children with low average or higher intelligence cannot function within a normal educational setting because of severe learning or adjustment problems. They need unique, specialized programming designed to help them towards normal achievement. Professional educators in this

behavior; identification of patterns of possible field are also widely sought, and may function as teachers, diagnosticians, consultants, supervisors, or LD tutors. Candidates for the LD/BD certificate must either hold a standard teaching certificate, or earn one concurrently.

Upper Division Courses
(Open only to students who have been admitted to Upper Division status in the School of Education).

802. *Education of Exceptional Children.* A survey of the problems and issues in the education of exceptional children and their characteristics and needs. Field observation required. Prereq.: Junior standing (Formerly 732). 4 q.h.

833. *Teaching Educable Mentally Retarded (Slow Learners).* Problems, techniques, and aids, with opportunity to study individual problems; attention to curricular units, guidance, observation of programs, and planning. 4 q.h.

834. *Teaching the Trainable Mentally Retarded Child.* Materials, equipment and general course of study applicable for severely retarded children. Emphasis on children with intelligence quotients lower than 50. 4 q.h.

848. *Supervised Student Teaching:* Educable Mentally Retarded (EMR), grades K-12. Prereq.: Educ. 705, 802 (732), 833, 851, 852, 853; senior status and approval of the chairman of the Special Education Department; not to be taken for less than eight-week period; see requirements for Student Teaching under School of Education. 6-15 q.h.

849. *Supervised Student Teaching:* Learning Disabilities/Behavior Disorders (LD/BD), grades K-12. Prereq.: Educ. 705, 802 (732), 852, 853, 861, 862, 863, 867; senior status, hold or be eligible to hold an Ohio Standard teaching certificate in some other teaching area; approval of the chairman of the Special Education Department; not to be taken for less than an eight-week period; see requirements for Student Teaching under School of Education. 6-15 q.h.

851. *Principles and Practices in Curriculum Planning and Development for Educable Mentally Retarded (Slow Learners): Social Studies.* Principles, practices, materials and aids in teaching social studies to educable mentally retarded (slow learners); opportunities to study individual problems; attention to curriculum units, guidance and planning; participation in local schools. Prereq.: Education 833 recommended. 3 q.h.

852. *Curriculum Planning and Practices in Special Education-Language Arts.* Principles, practices, materials, and aids for language arts in special education. Diagnostic and evaluative procedures; individual problems; techniques, curriculum units, guidance, planning; tutoring and participation. Prereq.: Education 812, and 833 or 863 recommended. 3 q.h.

853. *Curriculum Planning and Practices in Special Education-Arithmetic.* Principles, practices, and aids for arithmetic in special education. Diagnostic and evaluative procedures; individualized instructional techniques; observation, tutoring, and participation. Prereq.: Education 833 or 863 recommended. 3 q.h.

854. *Preparation, Selection and Adaptation of Instructional Materials in Special Education.* Laboratory experiences in appropriate preparation, selection and/or adaptation of instructional media in special education; utilization of auditory, visual, kinesthetic modes as they relate to problems of the handicapped; emphasis on teacher-made devices and aids, use of materials in alternative classroom settings. Prereq.: Education 802 and 833 or 863 recommended. 3 q.h.

854L. *See description of Education 854.* May be repeated. 1 q.h.

855. *Occupational Orientation and Job Training for Educable Mentally Retarded (Slow Learners).* Background and development of job training programs, covering aspects of occupational adjustment in terms of practical academic experiences and employment opportunities; observation of local employers and programs in local schools. Prereq.: Education 833 and six hours of special education methods or equivalent. 3 q.h.

858. *Education of Gifted or Superior Students—Their Characteristics and Educational Needs.* A course to acquaint the prospective teacher with knowledge of the identification of gifted students, their developmental characteristics, the problems they present and encounter in the usual curriculum pattern, and how the needs of gifted and superior students can be and are being met. Prereq.: Education 802. 3 q.h.

861. *Introduction to Learning Disabilities and Behavior Disorders.* Development of an understanding of the etiology of learning disabilities and multiple causes of disturbed

neurological disability and emotional disturbance; techniques in meeting the needs of learning disabled and disordered individuals.

862. *Clinical Teaching of Children with Behavior Disorders.* A course to acquaint the prospective teacher with methods of managing and instructing children who present behavioral disorders which interfere with the learning process. Prereq. or corequisite: Education 863. 3 q.h.

863. *Education of the Child With Learning Disabilities.* A course to acquaint the prospective teacher with the etiology of learning disabilities, the identification of the manifest patterns indicating possible neurological involvement, the educational implications of learning disability, and how the needs of children who have learning disabilities may be met. Prereq.: Education 802 or 861 recommended. 3 q.h.

864. *Teacher-Parent Consultation.* A course to acquaint the prospective teacher with the special problems faced by a parent of an exceptional child, techniques of reporting to parents, and gaining cooperation without antagonizing the parent. Prereq.: Education 802 and 833 or 863 recommended. 3 q.h.

865. *Workshop in Special Education.* Intensive study and related activities in one or more of the following special education curriculum areas: trainable mentally retarded, educable mentally retarded, learning disability/behavior disorder, multi-handicapped. May be repeated if content is different. 1-6 q.h.

867. *Practicum in Learning Disabilities/ Behavior Disorders.* Intensive experiences with pupils identified as benefiting from a learning disability/behavior disorder program; diagnosis and evaluative teaching strategies and materials; individualized and group instructional techniques. Prereq.: Education 862, 863. May be repeated to maximum of accumulative total of 6 q.h. 1-6 q.h.

868. *Independent Study in Special Education.* Individual work under special education staff guidance; curriculum development or special project in special education areas; individual problems in community agencies or schools. Prereq.: Education 802, 833 or 863, or equivalent. May be repeated to maximum of accumulative total of 6 q.h. 1-6 q.h.

CERTIFICATION PROGRAMS IN SPECIAL EDUCATION

An undergraduate student seeking certification in Special Education (EMR or LD/BD) must complete a specified series of general education courses in addition to the upper division (professional education) courses designed to meet state certification standards. Most students prefer to earn two (or more) certificates, i.e., either in Special and Elementary Education or in Special and Secondary Education. In the case of the certification program in Learning Disabilities and Behavior Disorders, a combined program is mandatory, since the certificate cannot be granted independently of another standard certificate.

Curriculum in Special Education and Elementary Education

A. General Education Requirements

Courses	Cr.
Courses	**Cr.**
English 550, 551	8
English 650	5
English 708	4
Hum. (Engl. 610-616, Phil., etc.)	4
Speech 554	4
Speech 705	4
Psychology 560 (601)	4
Psychology 755	4
Music 521	3
Music 709, 710, or 711	4
Music 721	3
Art 760	4
Art 767	3
HPE 590	3
HPE Activity (622)	1
HPE Activity	1
HPE Activity	1
HPE 722 (p622)	3
HPE 721	4
Mathematics 515	5
Mathematics 516	4
Geography 502	4
History 605 or 606	4
History 655 or 656	4
History 611, 661, 622, or 663	4
PLUS from Economics, Geography, History, Political Science, Social Science, or Sociology	9
Biology 505	4
Physical Science (Chem. 501, Astron. 504, Geog. 503, Geol. 505 or 510, or Physics 500)	4
Elective Science	4

Education 501 3
Education 502 3

B. Upper Division Courses: The student must complete the Elementary Education certification courses plus either those listed for the EMR or LD/BD certificate.

1. Elementary Education

Courses	Cr.
Ed. 705 Prof. Lab. Exper.	3
Ed. 708 Soc. Found. of Ed.	4
Ed. 710 Ed. Meas. & Guidance	4
Ed. 713 Teaching Arithmetic	3
Ed. 714 Teaching Soc. Sci.	3
Ed. 715 Teaching of Science	3
Ed. 801 Purp. & Pract.	3
Ed. 812 Language Arts I	3
Ed. 813 Language Arts II	3
Ed. 841 Stud. Teaching: Elem.	9-15

2. Educable Mentally Retarded

Courses	Cr.
Ed. 802 Ed. Excep. Children	4
Ed. 833 Teaching EMR	4
*Ed. 851 Soc. Stud. for MR	3
*Ed. 852 Sq. Ed. Lang. Arts	3
*Ed. 853 Sp. Ed. Arithmetic	3
Ed. 855 Occup./Job Training	3
Ed. 861 Intr. LD/BD	3
Ed. 864 Teacher-Parent Consult.	3
Ed. 848 Stud. Teaching: EMR	12-15

*Must register with Ed. 854L (1 hr.)

3. Learning Disabilities & Behavior Disorders

Courses	Cr.
Ed. 802 Ed. Excep. Children	4
Ed. 861 Intr. LD/BD	3
*Ed. 852 Sp. Ed. Lang. Arts	3
*Ed. 853 Sp. Ed. Arithmetic	3
*Ed. 863 Ed. of LD Child	3
*Ed. 862 Clinical Teaching	3
Ed. 864 Teacher-Parent Consult.	3
Ed. 867 Practicum in LD/BD	6
Ed. 881 Corrective Reading	4
Ed. 849 Stud. Teach.: LD/BD	12-15

*Must register with Ed. 854L (1 hr.)

C. Specilization: Students must select a 21-hour support area, in consultation with an advisor. Approved areas include Physical Education, Psychology, Sociology/Anthropology, Art, Music, Early Childhood Education, Educational Media, and Reading. Up to nine hours of courses listed above may be applied toward the support area.

Other Curriculum Options: There are four additional classes of students who may be admitted to certification programs in Special Education. For clarity of presentation, they are as follows:

1. Students possessing a bachelor's degree and a certificate in elementary or special education may become certified in one of the above areas by completing the courses listed in B2 or B3.

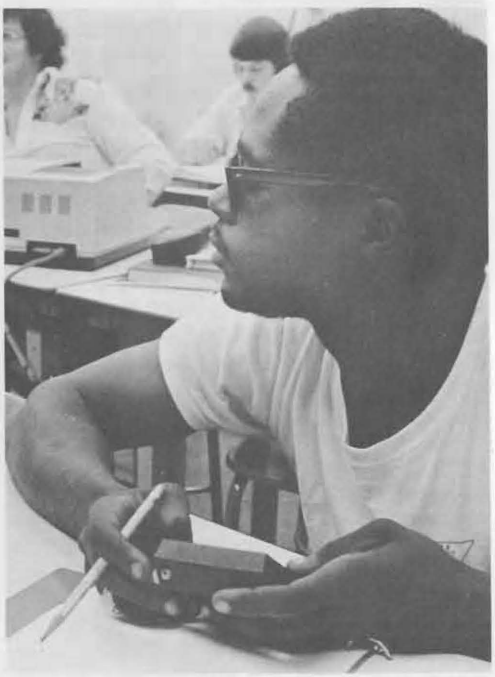
2. Students possessing a bachelor's degree and a High School or Special (Art, Music, etc.) teaching certificate must complete the above, in addition to Ed. 812 and 813. Additional recommended courses include Ed. 713, 714, 715, 814, and 881. Those planning to work in an elementary or middle school setting may wish to take Art 767 and HPE 722.

3. Undergraduate students in Secondary Education must complete everything listed above, in addition to a support area as indicated in item C.

4. Students who possess a bachelor's degree without a teaching certificate should seek advisement from a faculty member in the Department of Special Education.

The William Rayen School of Engineering

George E. Sutton, Dean



ORGANIZATION AND DEGREES

OBJECTIVES

The goal of the William Rayen School of Engineering is, in concert with the goals of Youngstown State University, to provide education and training to prepare the individual for the technical and personal challenges associated with the functions of an engineer in society.

Technology and society change with time, but fundamental principles are timeless. Therefore, the major emphasis is upon ensuring preparation in the physical sciences, engineering sciences, social sciences, and humanities for every student. Individual departmental curricula provide application of the fundamentals appropriate to that particular field of engineering. Because of the temporal nature of our technological society the curricula are under continual study to ensure changes necessary to adapt to professional and societal needs.

Academic standards are sufficiently rigorous to maximize the probability that the individual will find satisfaction through success in the chosen profession.

FACILITIES

The Engineering Science Building is the home of the William Rayen School of Engineering. The use of this building was a gift to the University by the people of Ohio as enacted by the Ohio Legislature in 1965. The building was completed and dedicated in 1968 after the University became Youngstown State University. It contains 171,000 square feet of usable floor space which includes 48 laboratories, 30 classrooms, and eight research and development rooms.

The school's spacious laboratories have modern equipment for standard experiments as well as for advanced study in many fields. There is a 288-seat auditorium, facilities for closed-circuit television, and a computer center. The school also operates a machine shop to construct equipment used in research activities. The ample drawing rooms, classrooms, and offices are entirely modern.

The *Chemical Engineering Unit Operations Laboratories* are located in the Engineering Science Building and the Ward Beecher Science Hall.

There are six laboratories which are equipped with bench scale and pilot plant equipment to be used for heat and mass transfer and chemical reactions. The available facilities include an analog computer, pneumatic controllers, chemical reactor, distillation and absorption columns, double effect evaporator, grinding and crushing mills, rotary and vacuum tumble dryers, vacuum leaf and plate frame filters, extraction units, and a gas chromatograph.

The *Civil Engineering Laboratories* include the following: a concrete laboratory, an environmental engineering laboratory, an incompressible fluids laboratory, a photogrammetry laboratory, a soil mechanics laboratory, a strength of materials laboratory, and a surveying laboratory.

The concrete laboratory is equipped to do routine testing and research related to effects of static, dynamic, and impact loads.

The environmental engineering laboratory is equipped to perform bacteriological, chemical, and physical tests and research on water and waste-water.

The incompressible fluids laboratory is equipped to perform a variety of fluid flow experiments. The equipment includes a self-contained flume, 4' x 3' x 60' long, an 80' x 4' x 4' flow channel, and a constant-head standpipe.

The photogrammetry laboratory is equipped with a Kelsh Plotter and auxiliary equipment.

The soil mechanics laboratory is completely equipped to perform tests and research on soils.

The strength of materials laboratory is equipped to perform strength tests on materials. The equipment includes a 600,000-pound Universal Testing Machine, three 120,000-pound Universal Testing Machines, three torsion machines, as well as a variety of smaller testing machines.

The surveying laboratory is equipped for instruction in the care and use of all surveying instruments and calculating machines.

The *Electrical Engineering Laboratories* include a circuits laboratory, basic electronics laboratory, physical electronics laboratory, quantum electronics laboratory, networks and communications laboratory, switching circuits and communications laboratory, electromagnetic energy conversion laboratory, controls laboratory and fields laboratory, all of which have an ample supply of standard and specialized equipment.

The electronics laboratories contain signal generators; oscilloscopes; equipment for the study of thin films, thick films, and membranes; XY recorders; ruby and helium-neon lasers; vacuum systems; optical benches; monochromators; spectraphotometers; spectrographs; an array of beam-splitters; optical attenuators; and Q-switches.

The communications laboratories contain a variety of signal generators, frequency analyzers, transmission lines, breadboard modules, and a digital computer.

The electromagnetic energy conversion laboratory has available generalized machines, magnetic core devices, rotating amplifiers, torque translators, and a variety of frequency and speed instruments.

The controls laboratory includes a variety of circuit components; amplifiers; analog computers; a function follower; and function generators.

The fields laboratory has available microwave generators, wave guides and meters, antennae, a shielded room, and a

large roof area for tracking radiation and solar experiments.

The *Mechanical Engineering Department* maintains eight laboratories in the Engineering Science Building. Located on the first floor are laboratories for thermodynamics, heat transfer, compressible fluids, internal combustion engines, and photoelasticity. Laboratories for heat power, experimental machine design, and vibrations are located in the basement.

The laboratories in the heat and fluid flow areas of study contain such major apparatus as a steam power plant; subsonic and supersonic wind tunnels; conduction, convection, and radiation heat transfer test units; a 90-horsepower gas turbine with test stand; commercial refrigeration and air conditioning units; various internal combustion engines; steam boiler, engine, and turbine; and gas analyzers.

The laboratories in the mechanical design area of study are equipped with apparatus necessary for static, dynamic, and impact stress analysis by methods employing electrical strain gages, photoelasticity, and brittle lacquers; a long-time creep tester; fatigue testers; vibration sources with analyzers and recorders; and an analog computer.

The *Materials Science laboratories*, located in the basement and first floor of the Engineering Science Building, include a field-ion microscope laboratory, electron microscope laboratory, multi-purpose radioisotope analysis, counting system, diffusion laboratory, radiograph laboratory, X-ray laboratory, phase transformation laboratory, calorimetric laboratory, metallographic laboratory, high pressure and high temperature laboratories, ultrasonic laboratory, electric and magnetic properties laboratory, special process metallurgy laboratory, zone melting laboratory, welding laboratory, electrometallurgy laboratory, alloy preparation laboratory, single crystal laboratory, and a general mineral benefication laboratory.

The various materials science laboratories are equipped for all phases of metallurgical studies with the latest modern equipment, which includes a modified calorimeter with special accessories such as a quartz themometer, sophisticated adiabatic calorimeter and modern electronic devices, heat treatment facilities such as salt pots and electric furnaces; darkroom facilities; large metallographs; microscopes; rolling mills and forming equipment; electron beam zone refiner induction furnaces; grinding equipment; mounting presses; motorized specimen polishers; specimen etching facility; sectioning tools; a collection of over 400 prepared specimens; hardness testers; and high speed cut-off machines.

AWARDS AND PRIZES

Awards and prizes for engineering students are listed in the General Information section of the catalog.

FEES

See *Fees and Expenses* in the General Requirements and Regulations section.

SCHOLARSHIPS AND LOANS

Scholarships and loan funds applicable to engineering students are listed in the General Information section.

ADMISSION

For admission to the William Rayen School of Engineering see *Admission Requirements* in the General Requirements and Regulations section. For courses leading to the degree of Bachelor of Engineering, see the pages that follow.

REQUIREMENTS FOR THE DEGREE

Bachelor of Engineering

It is the student's responsibility to see that all the graduation requirements for the degree sought are satisfied, but it is recommended that the student seek the help of the advisor frequently.

The curricula leading to the degree require a minimum of 198 quarter hours of credit, not including any make-up of high school deficiencies. These must be completed during the first two years of course work.

The student whose needs are not adequately met by any of the curricula may consider the Individual Curriculum Program described under the General Requirements and Regulations section.

A limited offering is available during summer terms, and should be used with the consultation of the advisor.

The table below shows the minimum requirements:

† The student should be familiar with the course-numbering system and its significance, as well as the abbreviations used to indicate the amount of credit. These are explained at the end of the General Requirements and Regulations section.

PRE-COLLEGE

SUBJECT	High School Units
English	3
Algebra	2
Geometry	1
Trigonometry	1/2
Chemistry	1
Mechanical Drawing	1
Other	7-1/2*

(*Solid Geometry and Physics recommended)

IN THE UNIVERSITY
MINIMUM COLLEGE REQUIREMENTS

GENERAL UNIVERSITY	Quarter Hours
Basic Composition	8
Health and Physical Education 590	3
Health and Physical Education Activities	3
Basic Sciences (as specified by the department)	24
Mathematics (as specified by the department)	22
Social Sciences	16
Humanities	8
Total	**84**
ENGINEERING	114*
TOTAL	**198**

*This component shall bring the total minimum degree requirements to 198 quarter hours, and shall satisfy the ECPD requirements of one year of engineering science and one-half year of design, synthesis and systems.

The engineering program can be completed in four academic years by those who are capable of successfully completing the study loads outlined.

COURSES OF INSTRUCTION AND CURRICULUMS†

Engineering 579. Science and Modern Society. An honors course for high school seniors interested in mathematics and the "hard sciences." Scientific developments in major areas and the ecological, economic and cultural impact of their application on society are discussed. 6 q.h.

Engineering 581. Introduction to Engineering. Lectures on activities, practices and career opportunities in the various fields of the engineering profession. Discussion of various engineering curricula as related to the preparation of the engineering student in his/her particular field. 2 q.h.

CHEMICAL ENGINEERING AND MATERIALS SCIENCE

Professors Slawecki (chairman), Ahmed and Sheng; Associate Professors Devletian, Jones and Szirmay.

The chemical engineering program, supplemented with courses in chemistry, physics, mathematics, and engineering, provides a broad preparation for design, operation and management in the chemical, biological, pharmaceutical, and energy conversion industries as well as graduate study leading to research positions in industry and government and to academic careers.

The curriculum may be easily modified for students whose career objectives lie in environmental, nuclear, or biochemical engineering, medicine, or business administration.

Transfer to chemical engineering from other engineering programs, or from chemistry, physics, biology, and mathematics may be accomplished without loss of time or credit during the first two years.

Chemical Engineering

555. *Introduction to Modern Technology.* A comprehensive survey of present and projected future status of modern technology following a brief historical account of technological progress since the industrial revolution. Broad familiarization with technical

terminology and major breakthroughs. Jointly taught with all other engineering departments. 4 q.h.

581. *Introduction to Chemical Engineering.* A survey of chemical engineering. Fundamental concepts and methods of chemical engineering. Laboratory demonstrations of chemical engineering operations. 1 q.h.

680. *Techniques of Chemical Engineering.* A systematic survey of well-established and readily available methods for implementing the usual types of operational or process procedure. Where several techniques may be applicable; the advantages and limitations of each are considered. Prereq.: Math. 673, Chem. 517. 3 q.h.

681R. *Industrial Stoichiometry.* To aid the non-chemical engineer to organize, analyze, and effectively utilize the information inherent in chemically stoichiometric relationships, as they apply to actual plant situations. Prereq.: Math. 572, Chem. 516. 4 q.h.

682, 683, 684. *Chemical Engineering Principles.* Engineering units and dimensions. Methods of analysis and measurement. Perfect gas and real gas relationships. Material and energy balances for both non-flow and flow systems. Cascade theory of staged separation processes. Concepts of reflux, algebraic solutions for linear systems and graphical methods of analysis. Prereq.: Math. 572, Chem. 516. 3+3+3 q.h.

685R. *Corrosion Control Engineering.* Introduction to electrochemical mechanism and theory of corrosion, engineering practices, and criteria for both anodic and cathodic control by anodic rectification. Theory and engineering practices in the use of inhibitors. Prereq.: Math. 673, Chem. 517 or ChE 681R. 4 q.h.

688. *Energy Assessment.* Concept of energy assessment. Technology of energy production that includes coal gasification, liquefaction, magnetohydrodynamics, utilization of shale oil, solar, geothermal, and chemical energy. Nuclear energy utilization. Fuel from wastes. Energy resource distribution and future supply and demand. Simple calculations relating to fuel saving, production, and consumption. Primarily for non-engineering students. May be taken by engineering students as an elective. Prereq.: Chem. 503 or Physics 500. 3 q.h.

720. *Industrial Pollution Control.* Introduction to the thermodynamic and kinetic properties of the atmosphere and to the geophysical aspects of the natural water systems. Chemistry and physics of air and water pollution as related to modern methods for waste control in chemical operations including filtration, ejector aeration, deep well disposal, activated sludge treatment and disposal, and current approach to waste control education and program formulation. Prereq.: Math. 674, Chem. 517, or ChE 681R. 3 q.h.

726. *Elementary Nuclear Reactor Engineering.* Basic engineering science to serve as background material for nuclear reactor design. Nuclear fission as an energy source. Reactor use and classification. Comprehensive discussion of reactor design problems such as neutron distribution in the core, type of moderator, heat removal, and radiation protection. Prereq.: Math. 674, Physics 610. 3 q.h.

771, 772. *Chemical Engineering Thermodynamics.* Development of the concepts and formalisms of thermodynamics and their applications to chemical engineering systems. Real and ideal behavior of single and multi-component systems. Introduction to the thermodynamics of chemical equilibria and phase equilibria. Thermodynamics analysis of processes. Prereq.: ChE 684, Math. 674. 4+4 q.h.

783. *Engineering Plastics.* A survey of the plastics industry from the following standpoints: 1. Mechanisms of formation and the process and operations necessary for their implementation. 2. Relationships of formulation with product properties. 3. Various sources and preparations of monomers. 4. Relative availability of reagent materials and their cost. 5. Polymer classification on a utility basis. Prereq.: Math. 674, ChE 684. 3 q.h.

785, 786. *Transport Phenomena.* Mathematical formulation of conservation laws. Dimensional analysis. Mechanism and fundamentals of momentum, energy and mass transfer from macroscopic point of view with selected applications to analysis and design of chemical engineering equipment. Prereq.: ChE 684, Math. 705. 4+4 q.h.

785L, 786L. *Transport Phenomena Laboratory.* Experimental studies of transport properties and momentum, energy and mass transfer using industrial type equipment. Correlation of data and comparison with theory. Preparation of technical reports. Prereq.: ChE 785 and ChE 786, respectively. 1+1 q.h.

787, 788. *Unit Operations.* Diffusional operations, phase separations such as crys-

tallization, filtration, evaporation, humidification and drying. Membrane separations. Materials handling and mixing. Prereq.: ChE 786. 4+4 q.h.

787L, 788L. *Unit Operations Laboratory.* Experiments in absorption, cascade operations, reaction kinetics, mixing and other chemical engineering operations employing industrial and pilot plant size equipment and instrumentation. Treatment of experimental data, correlations and comparison with theory. Preparation of technical reports. Prereq.: ChE 787 and ChE 788, respectively. 1+1 q.h.

789. *Man and the Technological Society.* An interdisciplinary critical examination of man in the modern technological society from the perspectives of engineering, life, and social science. The topics will be (1) history of technology, (2) the world's available energy and material resources, (3) population dynamics as they interact with nature and the human ecosystem, such as "the green revolution," cybernation, value concepts, and techniques to forecast societal changes. Prereq.: Junior standing, or consent of all instructors. Identical with Sociology 789 and Biology 789. 4 q.h.

800. *Special Topics.* Special topics and new developments in Chemical Engineering. Subject matter, credit hours, and special prerequisites to be announced in advance of each offering. Prereq.: Senior standing in Chemical Engineering or consent of instructor. 1-4 q.h.

801-802-803. *Thesis.* The student prepares a written report of at least 2,500 words on an investigation of a subject selected by the student and agreed upon by the major advisor and department chairman. Three bound copies are required: specifications are available on request. Prereq.: Senior standing. 2+2+2 q.h.

805. *Principles of Biomedical Engineering.* Application of engineering principles and methods of analysis to processes in the human body. Rheological, physical and chemical properties of body fluids. Dynamics of the circulatory system. The human thermal system. Transport through cell membranes. Artificial organs. Prereq.: Biol. 552 or concurrent, advanced standing in chemical engineering or consent of instructor. 4 q.h.

811. *Transport Phenomena III.* An advanced treatment of transport of momentum, heat and mass. Differential balances. Application to the analysis and design of chemical process equipment. Prereq.: CEMS 786 or equivalent background. 4 q.h.

880R, 881R. *Chemical Reactor Design.* Chemical reaction equilibria. Theoretical developments and methods of interpreting experimental data pertaining to chemical kinetics. General design principles and construction features of reactors with application of these principles to the design of specific reactors. Prereq.: ChE 772, Math. 705. 3+3 q.h.

882. *Process Dynamics.* Introduction to automatic control and control loop concepts. Laplace transform techniques. Linear open-loop and closed-loop systems. Root-locus and frequency response methods. Non-linear methods. Process applications. Prereq.: ChE 787, Math 705. 4 q.h.

882L. *Process Dynamics Laboratory.* Experimental studies in process dynamics and control. Simulation of control systems with the aid of an analog computer. Treatment of experimental data with correlation and comparison with theory. Preparation of technical reports. One hour lecture/demonstration plus three hours laboratory. Prereq.: ChE 882. 1+1 q.h.

883. *Mathematical Methods in Chemical Engineering.* The applications of advanced mathematics to the solution of chemical engineering problems. Topics covered include treatment and interpretation of engineering data, formulation of ordinary and partial differential equations governing chemical engineering operations and their solutions by use of numerical and analytical techniques. Prereq.: ChE 786, Math. 705. 3 q.h.

884, 885. *Process and Plant Design.* Presentation of the analytical approach for establishing a technically and economically efficient plant and process design. Demonstration of the importance of proper correlation of laboratory and field data into a reliable and workable basis for projecting cost estimates of pilot and commercial plant "scaleups." Prereq.: ChE 788, 880. 3+3 q.h.

886. *Nuclear Reactor Design.* The steady state reactor core; four-factor equation, resonance escape probability, neutron flux distribution in various geometrics, two-group and multigroup theories. Transient reactor behavior and control; effect of delayed neutrons, fission product poisoning, nuclear fuels, nuclear heat transfer and burnout problems, reactor economy; fuel burnup and power cost. Thermal breeder and fast reactors. Neutron flux

distribution measurements. Radiation detection and monitoring. Prereq.: ChE 726. 4 q.h.

Curriculum for the degree of Bachelor of Engineering with the Major in Chemical Engineering

FIRST YEAR	Hrs.
Engineering 581	2
Chemistry 515, 515L, 516, 516L, 517, 517L, General Chemistry	12
Mathematics 571, 572, 673 Calculus	14
ChE 680 Techniques of Chemical Engineering	3
English 550, 551 Basic Composition	8
Health and Physical Education, Activity	1
Liberal Arts Electives	9
	49

NOTE: Students without background in mechanical drawing must enroll in M.E. 500 Drawing Fundamentals.

SECOND YEAR	Hrs.
Chemistry 719, 720 Organic Chemistry	8
Chemistry Electives	5
ChE 682, 683, 684 Principles of Chemical Engineering	9
Mathematics 674 Calculus	4
Mathematics 705 Differential Equations	4
Physics 510, 610 General Physics	8
IE 642 Engineering Computations	4
Health and Physical Education, Health	3
Health and Physical Education, Activity	1
Soc. 789 Man and the Technological Society	4
Liberal Arts Elective	3
	53

THIRD YEAR	Hrs.
Chemistry 739, 740, 741 Physical Chemistry	12
ChE 771, 772 Chemical Engineering Thermodynamics	8
ChE 785, 785L, 786, 786L Transport Phenomena	10
ChE 787 Unit Operations I	4
MatSci 606 Engineering Materials	4
CE 601, 602 Mechanics	8
Liberal Arts Elective	4
	50

FOURTH YEAR	Hrs.
ChE 787L Unit Operations Laboratory I	1
ChE 788, 788L Unit Operations II	5
ChE 801, 802, 803 Thesis	6
ChE 880R, 881R Chemical Reactor Design	6
ChE 882, 882L Process Dynamics	6
ChE 884, 885 Plant and Process Design	6
EE 714R Circuits and Electronics	4
ChE Electives	9
Technical Elective	4
Health and Physical Education, Activity	1
Liberal Arts Elective	4
	52

Department Technical Electives

	Hrs.
ChE 685R Corrosion Control Engineering	4
ChE 688 Energy Assessment	3
ChE 720 Industrial Pollution Control	3
ChE 726 Elementary Nuclear Reactor Engineering	3
ChE 783 Engineering Plastics	3
ChE 789 Man and the Technological Society	4
ChE 800 Special Topics	1-4
ChE 805 Principles of Biomedical Engineering	4
ChE 811 Transport Phenomena III	4
ChE 883 Mathematical Methods in Chemical Engineering	3
ChE 886 Nuclear Reactor Design	4

NOTE: The student may substitute a minimum of eight quarter hours of Chemical Engineering electives, including ChE 886, for ChE 801-802-803.

Materials Science

The program in materials science is designed to provide the student with a strong foundation of basic concepts fundamental to understanding the behavior of a wide range of engineering materials including steels and alloy steels, non-ferrous alloys, polymers, ceramics, semi-conducting solids, and composite materials. Like other engineering disciplines, materials science is based on sound knowledge of physical sciences, mathematics, and engineering. The program gives the student the background required for employment as a metallurgical engineer or a materials engineer in design, development, research, and technical management or entrance to graduate school for further studies.

The department offers two options: A. Metallurgical Engineering and B. Materials Science, to meet the needs of the students. However, the program of study can be modified for students whose career objectives may best be served by a suitable selection of courses in nuclear engineering, business administration, or other disciplines.

Students from physical and biological sciences, mathematics, and other engineer-

ing disciplines may transfer to materials science during the first two years without loss of time or academic credit.

The department offers a graduate program leading to the degree of Master of Science in materials science. The program is described in the catalog of the Graduate School.

555. *Introduction to Modern Technology.* A comprehensive survey of present and projected future status of modern technology following a brief historical account of technological progress since the industrial revolution. Broad familiarization with technical terminology and major breakthroughs. Jointly taught with all other engineering departments. 4 q.h.

581. *Introduction to Materials Science and Engineering.* Introductory course for freshmen to familiarize them with the field of materials science, the historical background and scientific developments of materials and their applications in modern society and technology; what is materials science and engineering?; professional role of the materials scientists in modern society, technology and science; nature and state of metals, ceramics, glasses, polymer materials and composite materials; general description of production and fabrication and properties of certain materials; uses of materials and topics on modern materials. Lectures and laboratory demonstrations. 1 q.h.

601R. *Introduction to Materials Science I.* Discussions of the basic electronic structure and properties of materials, theory of binding in solids—metals, alloys, semiconductors, ceramics, and plastic materials; electrical and magnetic properties of materials. Election emission: electronic specific heat. Tutorial and computations. Prereq.: Chem. 515 or consent of instructor. 4 q.h.

602R. *Introduction to Materials Science II.* Discussion of crystallography, the elastic and plastic properties of materials, ductile and brittle behavior of metals, plastic deformation, imperfections in crystals, elementary ideas of point defects, dislocations and their basic properties, strain hardening. Recovery, recrystallization, and grain growth. Tutorial and computations. Prereq.: MAT SCI 601R or consent of instructor. 4 q.h.

603R. *Introduction to Materials Science III.* Discussion of phase equilibria and phase diagram. Kinetics of phase changes, diffusionless and diffusion controlled phase transformation. Industrial metallurgy. Principles of heat treatment. Structural materials. Tutorial and computations. Prereq.: MAT SCI 602R or consent of instructor. 4 q.h.

606. *Engineering Materials.* Manufacturing processes, properties and uses of engineering materials such as ferrous and non-ferrous alloys, ceramics, concrete, polymers, and composites. Manufacturing processes to be covered are refining processes, heat treatments, and forming operations. Properties to be discussed are strength and strength-related properties such as hardness, ductility, creep, fatigue; corrosion resistance; and electrical properties. These properties will be related to the engineering applications and uses of various materials. An introduction to testing methods used to measure various properties of materials. Prereq.: For engineering students whose major is other than Materials Science. 4 q.h.

614, 615. *Structure and Properties of Materials I and II.* Structure of pure metals, ferrous, and non-ferrous alloys and their correlation with the previous history, heat treatment, and physical properties. (1 hour lecture + 3 hours laboratory.) Prereq.: Consent of instructor. 2+2 q.h.

620R, 621. *Chemical Principles of Materials Science I, II.* Discussion of the application of physiochemical principles to metallurgical or materials problems. Lecture and laboratory. Computations. Prereq.: Chem. 515 or consent of instructor. 4+3 q.h.

621L. *Chemical Principles of Materials Science Lab.* Laboratory experiments to illustrate the theoretical concepts discussed in MAT SCI 620 and 621. Prereq.: MAT SCI 620 or consent of instructor. 1 q.h.

650R. *Atomic and Molecular Structure of Materials.* Discussion of the atomic structure and molecular structures of materials with particular emphasis on the energy levels and material properties. Nuclear materials and alloy structures and their atomic structure changes in the alloy state. Prereq.: Chem. 515, Math. 673, or consent of instructor. 4 q.h.

730, 731, 732. *Metallography, Heat Treatment, and Pyrometry I, II, III.* Laboratory experiments to determine the effects of heat treatment on the structure, physical, and mechanical properties of ferrous and non-ferrous alloys. (1 hour lecture + 3 hours laboratory.) Prereq.: MAT SCI 615. 2+2+2 q.h.

740. *Mechanical Working and Its Effect on Materials.* General discussion of the different

types of mechanical working processes; rolling, forging, pressing, extrusion, wire drawing, etc., their effects on material properties, fracture mechanics, effect of strain rate and temperature on materials properties. Prereq.: MAT SCI 603R. 2 q.h.

741R. *Evaluation of Materials.* Discussion on the evaluation of materials by destructive and non-destructive testing methods. (3 lecture + 3 lab. hrs.) Prereq.: MAT SCI 740 or consent of instructor. 4 q.h.

780. *Casting, Welding and Solidification.* General discussion of the engineering aspects of welding and solidification of ferrous and non-ferrous alloys. Prereq.: MAT SCI 615. 3 q.h.

781. *Powder Metallurgy.* Scope of powder metallurgy, production of powders, sintering of powders, diffusion bonding, basic theories, application. Prereq.: MAT SCI 615. 3 q.h.

782. *Phase Diagrams.* Discussions and interpretation of phase diagrams of multicomponent systems. Prereq.: MAT SCI 603R. 3 q.h.

783M. *Ferrous and Non-Ferrous Alloys.* Basic scientific principles and theories applied to the design and heat treatment of alloys. Constitution, microstructure, heat treatment, phase distribution, and properties of ferrous and non-ferrous alloys. Prereq.: MAT SCI 615. 3 q.h.

784. *Crystalline Solids.* Discussion of crystallography point lattice and space lattices. Prereq.: MAT SCI 650R. 3 q.h.

791R, 792R, 793R. *Physical Metallurgy I, II, III.* Review of atomic and nuclear structure of materials. Band theory of solids; advanced discussion on electrical conductivity, magnetic properties and thermal properties of materials, different types of solids. Elastic and plastic properties of materials; modes of plastic deformation; slip and twinning; quantitative discussion on deformation mechanism; dislocation theories and their application. Phase diagrams and kinetics of phase transformation. Diffusion controlled and diffusionless phase transformation; theoretical treatment of nucleation and growth processes; diffusion. Lecture and laboratory. Tutorial and computations. Prereq.: MAT SCI 620R or ChE 771 or consent of instructor. 4+4+4 q.h.

815, 816. *Particle Interaction I and II.* Properties of radioactive particles. Interactions of nuclear particles with materials. Principles of detection, applications to engineering materials. (2 hour lecture + 3 hour laboratory.) Prereq.: MAT SCI 650R, 791R. 3+3 q.h.

817. *Management of Nuclear By-Products.* Sources and characteristics of radioactive material, principles and determination of tolerance; standards and regulations; protection from side effects. Prereq.: MAT SCI 815 or ChE 726, or concurrent. 1 q.h.

820, 821. *Principles of Extractive Metallurgy I, II.* Unit operations approach to pyrometallurgical, hydrometallurgical, and electrometallurgical processes used to produce ferrous and non-ferrous metallic materials. Mass and thermal balances are used to analyze the various stages of the above processes. Included in these analyses will be primary and secondary treatments of ores, primary reduction methods, and refining techniques. Computer methods are used in the analyses. Prereq.: ChE 681R, 771; IE 642. 4+4 q.h.

830, 831, 835. *Introduction to Nuclear Materials I, II, III.* Nuclear materials—their fission and fusion; classification of reactors; general theory, design and control of reactors; control systems; instrumentation. Kinetics and dynamic behavior of nuclear reactors; comprehensive theory and design; reactor stability under operating conditions; neutron kinetics and perturbation theory; nuclear heat generation and removal; selection of materials; production and processing of nuclear materials. Prereq.: ChE 726 or equivalent. 3+3+3 q.h.

840. *Modern Research Techniques.* The aim of this course is to familiarize the students with the "tools" of experimental metallurgy. Prereq.: MAT SCI 793R. 1 q.h.

851. *Introduction to Polymer Science.* Discussions of polymer materials with particular emphasis on their characteristics. Bonding mechanisms and composition. Prereq.: Chem. 517 or ChE 681R. 3 q.h.

852, 853, 854. *Advanced Engineering Materials (Non-Metallic) I, II, III.* Discussions on ceramic materials, composites and cermets with special emphasis on atomic bonding; structure of crystalline and non-crystalline solids; diffusion; grain growth; sintering and microstructure. Different types of glasses. Physical and mechanical properties; structure; volume and shear flow; glass-metal interface. Prereq.: MAT SCI 793R. 3+3+3 q.h.

860. *Mechanical Behavior of Materials.* Elastic and plastic behaviors of materials

under stress; theoretical discussions of theory of elasticity; theory of plasticity and laws of plasticity; applications of the theories on the various deformation processes; rolling, wire drawing, and extrusion, design of rolling mills and extrusion dies. Prereq.: MAT SCI 793R, 741R or consent of instructor. 3 q.h.

861. *Applied X-Rays I.* Generation of X-rays; principle of radiography, X-ray absorption; X-ray diffraction; interaction of X-rays with matter; Laue back reflection and transmission; powder diffraction; diffractometer; determination of crystal structure and lattice parameters. (Lecture + Lab.) Prereq.: MAT SCI 793R. 3 q.h.

862. *Applied X-Rays II.* Application of X-rays in physical metallurgy to determine solubility, lattice structure, atom location, grain size, preferred orientation, phase diagrams. (Lecture + Lab.) Prereq.: MAT SCI 861. 3 q.h.

863. *Thermodynamics of Materials I.* Principles of thermodynamics and its applications to materials, metallurgical systems, processes, and alloys. Prereq.: MAT SCI 650R, Math. 705, or consent of instructor. 3 q.h.

864. *Thermodynamics of Materials II.* Applications of thermodynamic principles to materials systems theory of alloys. Prereq.: MAT SCI 863 or ChE 772. 3 q.h.

865. *Advanced Science of Materials.* Structure and properties of materials; theories of binding in solid-free electron theory, based theory, and zone theories, density of states; electrical and magnetic behaviors, theory of alloys phases; structure of alloys. Prereq.: MAT SCI 793R. 3 q.h.

866. *Special Topics.* Discussion of special topics (in metallurgy or material science) which are of current research interests. Prereq.: Consent of instructor. 3 q.h.

871. *Physical Metallurgy IV.* Discussion on theories of corrosion, age-hardening, gases in metals. Prereq.: MAT SCI 793R. 3 q.h.

872. *Refractory Metals and Alloys.* Production and processing of refractory metals; physical and mechanical properties of the metals and their alloys; design of refractory alloys. Prereq.: MAT SCI 793R. 3 q.h.

890. *Metallurgy and Materials Colloquium.* Review of current metallurgical and materials research papers. Prereq.: Consent of instructor. (May be repeated up to a maximum of 4 q.h.) 1 q.h.

891-892-893. *Thesis I, II, III.* The student carries out an investigation on an approved project under the major advisor. The student presents a written report. The project must be formally approved by the department head. Prereq.: Senior standing or 150 q.h. 2-4 q.h. each

Curriculum for the Degree of Bachelor of Engineering with the Major in Materials Science

The section offers two options:

a. Metallurgical Engineering

b. Materials Science

FIRST YEAR	Hrs.
Engineering 581	2
Chemistry 515, 515L, 516, 516L General Chemistry	8
ChE 681R Industrial Stoichiometry	4
Mathematics 571, 572, 673 Calculus	14
Physics 510, 610 General Physics	8
English 550, 551 Basic Composition	8
Health and Physical Education, Health	3
Health and Physical Education, Activity	1
	48

SECOND YEAR	Hrs.
Mathematics 674 Calculus	4
Mathematics 705 Differential Equations	4
Physics 611 General Physics	4
MatSci 601R, 602R, 603R Introduction to Materials Science	12
MatSci 614, 615 Structure and Properties of Materials	4
CE 601 Mechanics I	4
ChE 771 Thermodynamics	4
IE 642 Engineering Computations	4
Soc. 789 Man and the Technological Society	4
Liberal Arts Electives	7
	51

THIRD YEAR	Hrs.
MatSci 740 Mechanical Working of Materials	2
MatSci 741 Evaluation of Materials	4
MatSci 791R, 792R, 793R Physical Metallurgy	12
MatSci 863 Thermodynamics of Materials	3
CE 602 Mechanics II	4
ChE 785, 786 Transport Phenomena	8
MatSci Options Electives	6
Technical Elective	4
Liberal Arts Electives	9
	52

FOURTH YEAR	Hrs.
MatSci 730, 731, 732 Metallography, Heat Treatment and Pyrometry	6

MatSci 820, 821 Extractive Metallurgy	8
MatSci 860 Mech. Behavior of Materials	3
MatSci 861 Applied X-Rays	3
MatSci 891, 892, 893 Thesis	6
EE 714R Circuits and Electronics	4
MatSci General Electives	6
MatSci Options Elective	3
Health and Physical Education, Activities	2
Technical Elective	4
Liberal Arts Elective	4
	49

NOTE A: The student may substitute a minimum of eight quarter hours of Materials Science electives for MatSci 891-892-893.

ELECTIVES

I. General

The student may choose six or more hours from the courses listed below:

MatSci 783M Ferrous and Non-Ferrous Alloys	3
MatSci 784 Crystalline Solids	3
MatSci 862 Applied X-Rays II	3
MatSci 864 Thermodynamics of Solids II	3
MatSci 865 Advanced Science of Materials	3
MatSci 866 Special Topics	3

II. MatSci Options

The student must choose at least nine hours in one of the following options:

Option A: Metallurgical Engineering

MatSci 780 Casting, Welding, Solidification	3
MatSci 781 Powder Metallurgy	3
MatSci 783M Ferrous and Non-Ferrous Alloys	3
MatSci 871 Physical Metallurgy IV	3
MatSci 872 Refractory Metals and Alloys	3

Option B: Materials Science

MatSci 782 Phase Diagrams	3
MatSci 851 Intro. to Poly Sci	3
MatSci 852 Adv. Engr. Matl. I	3
MatSci 853 Adv. Engr. Matl. II	3
MatSci 854 Engr. Matl. III	3

NOTE B: The department offers the following interdisciplinary minor.

NUCLEAR SCIENCE AND ENGINEERING MINOR

The minor is open to all engineering and physical science majors and comprises a minimum of 21 quarter hours including 10 quarter hours of core courses and the rest selected from the list of electives.

Engineering students may substitute a number of their departmental electives or other technical electives with the nuclear engineering courses to obtain the nuclear engineering minor with few or no additional credit hours.

CORE COURSES	Hrs.
ChE 726 Elementary Nuclear Reactor Engineering	3
MatSci 830 Introduction to Nuclear Materials I	3
ChE 886 Nuclear Reactor Design	4
	10

ELECTIVES	Hrs.
ChE 881 Transport Phenomena III	4
ChE 883 Mathematical Methods in Chemical Engineering	3
EE 819R Plasma Dynamics	4
MatSci 817 Management of Nuclear By-Products	1
MatSci 831, 835 Introduction to Nuclear Materials II, III	6
ME 721 Heat Transmission	4
Biology 825 Radioisotopes in Biology	4
Chem. 730 Clinical Radiochemistry	3
Chem. 730L Clinical Radiochemistry Lab	1
Chem. 731 Nuclear Chemistry and Applications	3
Math 706 Differential Equations II	4
Physics 704 Introduction to Modern Physics I	3
Physics 704L Modern Physics Lab I	1
Physics 705 Introduction to Modern Physics II	3
Physics 705L Modern Physics Lab II	1
Physics 826 Elements of Nuclear Physics	3
Physics 826L Nuclear Physics Lab	1

NOTE C: Transfer Students

Transfer students from any two- or four-year academic program at other institutions or at this University, who wish to pursue studies in Chemical Engineering or Materials Science should consult the department chairman for individual counseling in order to arrive at a program of studies fully utilizing their educational background and requiring a minimum of time to satisfy the requirements for the degree of Bachelor of Engineering.

CIVIL ENGINEERING

Professors Cernica and Householder (chairman); Associate Professors Bakos, Bellini, and Ritter; Assistant Professor Kahn.

555. *Introduction to Modern Technology.* A comprehensive survey of present and projected future status of modern technology following a brief historical account of technological progress since the Industrial Revolution. Broad familiarization with technical terminology and major breakthroughs. Jointly taught with all other engineering departments. 4 q.h.

601. *Mechanics I.* Principles of engineering

mechanics as applied to statics with vector applications to resultants of forces, centroids, and centers of gravity, distributed loads, equilibrium, and friction. Prereq.: Math 572, Phys. 510 or concurrent. (F,W) 4 q.h.

602. *Mechanics II.* Physical properties of area and masses, and methods of virtual work and energy with engineering applications. Elementary theory and relationships between load, stress, and strain in tension, compression, torsion, and bending. Combined stresses in members. Prereq.: CE 601. (W,Sp) 4 q.h.

603. *Mechanics III.* Deflection of beams, indeterminate beam analysis, column theory, and connections. Experimental verification of theories of strength of materials. Prereq.: CE 602. (F,Sp) 4 q.h.

604. *Mechanics IV.* This course is intended to: 1) provide an opportunity for two-year technology graduates to continue their education via a four-year engineering program, with a minimum of lost credit; 2) make it possible for *practicing* engineers and technicians to refresh their basic mechanics background; 3) permit transfer from other two-year technology programs to our four-year program. The course covers principles of engineering mechanics as applied to statics, with vector applications to resultants of forces, centroids, distributed loads, equilibrium, friction, moments of inertia, and virtual work. To be followed by elementary theory of relationships between load, stress, strain, torsional shear, and stresses in simple beams, displacements, energy methods, and statically indeterminate structures. Prereq.: Consent of department chairman; or concurrent: Math. 673. 4 q.h.

710. *Surveying I.* The theory of surveying and the use of instruments. Problems in leveling, traversing, and topography. Introduction to circular curves and vertical curves. Prereq.: Math. 503 or equivalent. (F) 4 q.h.

710L. *Surveying I Laboratory.* Field surveying principles and techniques. Uses of transit and level are stressed. Prereq.: Concurrently with CE 710. (F) 1 q.h.

711. *Surveying II.* A study involving the location, design, and construction of transportation systems, including route selection, horizontal and vertical alignment, earthwork calculations and layout. Prereq.: CE710. (Sp) 3 q.h.

711L. *Surveying II Laboratory.* Field and office techniques used in layout of circular, compound, and spiraled horizontal curves, and vertical curves. Prereq.: Concurrently with CE 711. (Sp) 1 q.h.

716. *Fluid Mechanics.* A study of the laws of fluid mechanics and their application as applied to incompressible flow; properties of fluids; fluid statics; kinematics and kinetics of one-dimensional flow; impulse-momentum; and viscous flow in pipes. Course includes a laboratory to illustrate the fluid mechanics principles of incompressible fluids. Prereq.: CE 602, IE 642. (F,W) 4 q.h.

717. *Hydraulics Engineering.* Civil engineering application of fundamental fluid mechanics principles to open and closed channel flow, distribution, systems, storage requirements, economics, extreme value theory, and basic concepts of hydraulic structures. Prereq.: CE 716. (Sp) 4 q.h.

748. *Structural Engineering.* This course is intended to: 1) provide an opportunity for two-year technology graduates to continue their education via a four-year engineering program, with a minimum of lost credit; 2) make it possible for *practicing* engineers and technicians to refresh their basic structural background; 3) permit transfer from other two-year technology programs to our four-year program. The course covers in-depth treatment of dead, live and moving loads, elastic deformations as well as analysis of statically indeterminate structures, including beams, trusses, and frames. Solutions of indeterminate structures using energy methods, including an introduction to design of reinforced concrete and structural steel members—beams, columns. A study of soil properties including classifications, capillarity, permeability, stress and strain and settlement. Prereq.: Consent of department chairman; or concurrent: Math. 673. 4 q.h.

749. *Structural Analysis I.* The determination of shears, moments, and stresses in statically determinate beams, frames, and trusses. Consideration of dead, live, moving, and wind loads. Elastic deflections of simple structures. Introduction to the analysis of statically indeterminate structures using numerical and energy methods. Prereq.: CE 603. (Sp) 5 q.h.

800. *Special Topics.* Special topics and new developments in Civil Engineering. Subject matter, credit hours, and special prerequisites to be announced in advance of each offering. Prereq.: Senior standing or consent of instructor. May be repeated to a maximum of 8 q.h. 1-4 q.h.

810. *Transportation I.* Principles of highway and traffic engineering, to include administration, economic studies, finance, highway design standards, traffic characteristics, accidents, traffic studies, signalization, traffic markings and markers, highway capacity, long range and route planning, and construction planning and supervision. Laboratory provided for field studies of traffic speeds, volumes, intersection delays, intersection operations, and signalization. Prereq.: CE 710. (F) 4 q.h.

811. *Transportation II.* Design methods for flexible, rigid, and other wheel-supporting pavements to include investigation, testing, and preparation of sub-grade, base course materials and selection, and characteristics of various pavement mixtures. Laboratory provided for the design, proportioning, preparation, and testing of various paving mixtures. Prereq.: CE 810, CE 881 or concurrent. (W) 4 q.h.

829. *Civil Engineering Materials.* A course designed to introduce to the student the various materials available to the civil engineer for design and construction work. Materials to be studied include structural grade and high-strength steels, reinforcing bars, structural aluminum, cements, asphalts, aggregates, brick, block, timber, plastics and glass. Prereq.: CE 603. (W) 4 q.h.

833. *Fluid Mechanics & Hydraulic Engineering.* This course is intended to: 1) provide an opportunity for two-year technology graduates to continue their education via a four-year engineering program, with a minimum of lost credit; 2) make it possible for *practicing* engineers and technicians to refresh their basic fluid mechanics background; 3) permit transfer from other two-year technology programs to our four-year program. The course covers a study of the laws of fluid mechanics and their applications as applied to incompressible flow, kinematics and kinetics of one dimensional flow, impulse-momentum, viscous flow in pipes, open and closed channel flow, distribution systems, storage requirements, extreme value theory and basic concepts of hydraulic structures. Prereq.: Consent of department chairman; or concurrent: Math.673. 4 q.h.

834. *Environmental Engineering I.* A study of the elements of water purification systems and sewage treatment plants, including discussions of physical, chemical, and biological treatment processes. Laboratory studies are used to demonstrate certain aspects of water chemistry. Prereq.: CE 717, ChE 681R. (F) 4 q.h.

835. *Environmental Engineering II.* A study of certain aspects of environmental problems, including discussions on air pollution control, industrial waste treatment, and selected topics in public health. Prereq.: CE 834 or consent of instructor. (W) 4 q.h.

849. *Structural Analysis II.* Analysis of statically indeterminate beams, trusses, bents and multistory frames, utilizing concepts of strain energy, virtual work, slope-deflection, and moment distribution. Introduction to matrix methods of analysis using force and displacement methods. Prereq.: CE 749. (F) 4 q.h.

853. *Design I.* An introduction to the design of reinforced concrete and structural steel. Included are the design of beams, columns, tensile members, and connections. Prereq.: CE 749. (W) 5 q.h.

854. *Design II.* The application of structural analysis theory to the design of reinforced concrete and steel structures including beams, girders, slabs, walls, frames, and truss members, in accordance with assigned specifications, for elastic and ultimate strength (plastic) design. Prereq.: CE 853. (Sp) 4 q.h.

860-861-862. *Thesis: Engineering Thesis.* The student prepares a written report of at least 2,500 words on an investigation of a subject selected by either the student or the faculty advisor. Three bound copies are required; specifications are available on request. For credit, the thesis must be accepted by both the dean and the advisor. Prereq.: Senior standing. 2+2+2 q.h.

873. *Transportation III.* Comprehensive transportation planning based on engineering and urban planning principles. Studies of existing and anticipated population, land use, economic base, travel characteristics, and transportation networks are included. Network design is based on the level of service concept. Prereq.: CE 810. 4 q.h.

875. *Hydrology.* A study of the properties, distribution, and behavior of water in nature as it appears in its three forms: precipitation, surface water, and sub-surface water. Hydrologic design of hydraulic structures. Prereq.: CE 716. (Sp) 4 q.h.

877. *Systems Engineering.* System approach to engineering design and operations involving deterministic and probabilistic models; linear programming, critical path

scheduling, and competitive strategies and their application to construction planning and other engineering problems. Prereq.: Math. 705. 4 q.h.

879. *Civil Engineering Analysis.* Application of mathematical and numerical methods to the systematic analysis and development of problems in the field of Civil Engineering. Prereq.: CE 849. 4 q.h.

880. Advanced Structural Analysis. Matrix formulation and solution of complex structural problems; force and displacement methods using flexibility and stiffness-coefficient matrices. Prereq.: CE 849. 4 q.h.

881. *Soil Mechanics.* Properties of soil, classification, capillarity, permeability, stress and strain, consolidation and compressibility, seepage. Prereq.: Math 674; CE 749. (F) 3 q.h.

881L. *Soil Mechanics Laboratory.* Typical soil testing procedures and physical testing of soil samples. Prereq.: Concurrently with CE881. (F) 1 q.h.

882. *Soil and Foundation Engineering.* Analysis and design of foundation structures; retaining walls, abutments, piers, piles, and footings; bearing pressures, movements and stability including embankments. Prereq.: CE 881, CE 853. (Sp) 4 q.h.

Curriculum for the Degree of Bachelor of Engineering with the Major in Civil Engineering

FIRST YEAR	Hrs.
Engineering 581	2
Math##	14
ME 501 Engrg. Drawings*	3
Basic Science##	16
Social Studies##	6
H&PE Activities Courses	3
CE 710 Surveying I	4
CE 710L Surveying I Lab	1
	49

SECOND YEAR	Hrs.
Math##	8
CE Mechanics	12
Social Studies##	7
H&PE 590 Health Education	3
English Composition	8
IE 642 Engineering Computations	4
Geology 611 Geoiogy for Engrs.	4
Chem. Engr. 681R Stoichiometry	4
	50

THIRD YEAR	Hrs.
CE 810 Transportation	4
CE 716 Fluid Mechanics	4
ME 641 Dynamics	4
Humanities##	8
ME 603 Thermodynamics I	4
IE 824 Engineering Economy	4
EE 714R Circuits & Electronics	4
Social Studies##	3
CE 749 Structural Analysis I	5
CE 717 Hydraulics Engineering	4
CE Selective Course 1**	4
	48

FOURTH YEAR	Hrs.
Thesis	6
CE 834 Environmental Engrg. I	4
CE 881 Soil Mechanics	3
CE 881L Soil Mechanics Lab	1
CE 853 Design I	5
CE 829 Civil Engrg. Materials	4
CE Selective Course II**	4
CE 882 Soil & Foundation Engrg.	4
Basic Science##	4
Technical Electives#	16
	51

*Students deficient in high school mechanical drawing must take ME 500 and ME 501 in lieu of ME 501.

**Civil Engineering Selective Courses:

The student must take the following selective courses depending upon the area of concentration within the civil engineering curriculum:

SELECTIVE COURSE I:

Transportation	CE 711 and CE 711L
Structures	CE 849
Environmental	CE 875

SELECTIVE COURSE II:

Transportation	CE 811
Structures	CE 854
Environmental	CE 835

#Technical Elective: A student may choose any technical course from Upper Division engineering, mathematics, science or business administration, for which the student has the prerequisites and the advisor's approval.

##These courses are to be selected with the consent of the departmental advisor.

NOTE: Only courses in the elective areas of the CE curriculum may be taken on a credit/no credit basis.

NORMAL DAY OFFERINGS

Winter	Spring	Fall
601	602	601*
602*	603*	603
716*	711	710*
811	711L	710L*

829*	717*	716
835	749*	810*
853*	854	834*
861	862	849
880	875	860
	882*	881*
		881L*

*These courses will not be offered during the day if they are offered during the night, unless it is a multi-section course.

NORMAL NIGHT OFFERINGS

77, 81, etc. 602	603	601
716	882	810
853		860
		710
		710L
78, 82, etc. 602	603	601
716	862	834
861	711	
	711L	
79, 83, etc. 602	603	601
716	717	710
829		710L
80, 84, etc. 602	603	601
716	711	881
	711L	881L
	749	

CERTIFICATE PROGRAM IN SURVEYING

A Certificate In Surveying Program is available for those persons seeking immediate technical knowledge in the field of surveying. The following basic areas are considered essential to such a program:

1. Mechanical, Civil, Architectural, and Basic Drawing Fundamentals. Surveyors must present their field measurements in the form of topographic maps, planemetric maps, allotment or subdivision layouts, profiles, etc., and thus, a strong background in drawing fundamentals is essential.
2. Surveying Techniques, Theory, and Practice.
3. Computer Fundamentals. With computer access as close as any office telephone (time sharing applications) and the widespread efficient application of computers in the surveying area such a background is not only desirable but essential.

The Civil Engineering Department administratively monitors this program.

CURRICULUM REQUIREMENTS

CE 710 Surveying I	5 q.h.
Drafting*	7
Math**	9
Computer Programming***	12
Speech 652 Bus. & Prof. Speaking	3
English 550 Basic Comp. I	4
CE 711 Surveying II	4
Geog. 731 Intro. to Cartography	4
Total	**48 q.h.**

*Recommended drafting courses include ME 501, ME 504 and DD 602. Courses to be selected with consent of advisor.

**Recommended Math courses include Math 570, 571, 572 and 670. Courses to be selected with consent of advisor.

***Recommended Computer Programming courses include CPT 601, 602 and 603 and IE 642. Courses to be selected with consent of advisor.

ELECTRICAL ENGINEERING

Professors Siman (Chairman) and Alexander; Associate Professors Foulkes, Kramer, Skarote; Assistant Professors Munro, Sendaula.

555. *Introduction to Modern Technology.* A comprehensive survey of present and projected future status of modern technology following a brief historical account of technological progress since the Industrial Revolution. Broad familiarization with technical terminology and major breakthroughs. Jointly taught with all other engineering departments. 4 q.h.

601. *Basic Circuit Theory I.* Basic principles of linear circuits. Circuit concepts and laws, methods of analysis, network theorems. Power in DC circuits. Transients in RC and RL circuits. Magnetic circuits. Prereq. or concurrent: Math 572. (F) 3 q.h.

602. *Basic Circuit Theory II.* Sinusoids, phasors, complex numbers. Analysis of AC circuits, phasor diagrams, impedance and admittance, resonance. Power in AC circuits. Magnetic circuits with AC signals. Prereq.: EE 601 or concurrent Math 673. (W) 3 q.h.

603. *Basic Circuit Theory III.* Manual inductance and transformers. Frequency response and transfer functions. Three phase circuits. Fourier series applications to non-sinusoidal periodic signals. Fourier transforms and Laplace transforms in circuit analysis. Prereq.: EE 602. (Sp) 3 q.h.

611. *Instrumentation and Computation Laboratory I.* Theory and applications of laboratory instruments. Laboratory experimentation. Digital computer techniques using ECAP or equivalent. Prereq. or concurrent: EE 601 or equivalent. (F) 1 q.h.

612. *Instrumentation and Computation Laboratory II.* Theory and applications of laboratory instruments. Laboratory experimentation. Digital computer techniques using ECAP or equivalent. Prereq.: EE 611. (W) 1 q.h.

613. *Instrumentation and Computation Laboratory III.* Theory and applications of laboratory instruments. Laboratory experimentation. Digital computer techniques using ECAP or equivalent. Prereq.: EE 612. (Sp) 1 q.h.

701. *Linear Network Synthesis and Design.* RC and LC driving-point impedances. Lossless two-ports and active two-ports with applications to filter design. Sensitivity analysis. Computer-aided design. Prereq.: EE 603, 613 and IE 642. 3 q.h.

702. *Fundamentals of Logic Circuit Design.* Number systems, theory and applications of Boolean algebra. Analysis of switching devices and circuits. Minimization of Boolean functions, tabular minimization of single- and multiple-output circuits. Prereq.: EE 707. 3 q.h.

703. *Control Systems Analysis.* Analysis of continuous-time systems using transfer-function and state-variable methods. Introduction to discrete-time systems. Compensation of continuous-time systems. Prereq.: EE 603. 3 q.h.

703L. *Control Systems Laboratory.* Laboratory experiments and exercises designed to accompany EE 703. Must be taken concurrently with EE 703. Prereq.: EE 613. 1 q.h.

704, 705, 706. *Field Theory: Analysis, Applications and Design I, II, III.* Vector relations, static electric fields, dielectric materials, boundary conditions, field mapping, steady electric currents and their magnetic fields, and motion of charged particles. Ferromagnetics, time changing electric and magnetic fields, Maxwell's equations, field and circuit theory relationships, plane waves, and Poynting-vector energy relations. Transmission line theory, terminated lines, impedance matching and transformation, waveguides, simple antenna systems, and group and phase velocity. Must be taken concurrently with 704L, 705L, and 706L, respectively. Prereq.: Math 705. 3+3+3 q.h.

704L, 705L, 706L. *Field Theory Laboratory I, II, III.* Laboratory experiments and exercises, and boundary-value computer problems to accompany EE 704, 705, and 706. Must be taken with EE 704, 705, and 706, respectively. Prereq.: IE 642. 1+1+1 q.h.

707, 708. *Electronic Circuit Analysis and Design I, II.* Terminal characteristics of electronic devices such as diodes, bipolar junction transistors, and field-effect transistors. Bias and small-signal models. Single- and multi-stage amplifiers. Power amplifiers. Frequency response. Feedback. Oscillators. Prereq.: EE 603. 3+3 q.h.

707L, 708L. *Electronic Circuit Laboratory I, II.* Laboratory experiments and exercises designed to accompany EE 707 and 708. Must be taken concurrently with EE 707 and 708, respectively. Prereq.: EE 613. 1+1 q.h.

709. *Communication Systems.* Signal analysis. Power spectral density. Design and analysis of modulation, detection, selection, and transmission circuits and systems. Must be taken concurrently with 709L. Prereq.: EE 708. 3 q.h.

709L. *Communication Systems Laboratory.* Laboratory experiments and exercises designed to accompany EE 709. Must be taken concurrently with EE 709. Prereq.: EE 708L. 1 q.h.

714R. *Circuits and Electronics.* Basic circuit analysis; steady state circuit analysis, electric networks, transient response, passive network and transfer functions. Electronic circuits; diodes and power conversion, tube and transistor models, linear equivalent circuit, special amplifier circuits, wave shaping and instrumentation. Prereq. or concurrent: Math. 572 or equivalent. 4 q.h.

715R. *Electrical Devices.* Introduction to the basic principles of analysis of electromechanical devices, study of automatic feedback control, instrumentation, and analog computers. Prereq.: EE 714R or permission of Electrical Engineering chairman. 4 q.h.

800. *Seminar.* Special topics, new developments. Prereq.: Senior standing. 1-4 q.h.

801-802-803. *Thesis.* The student prepares a written report of at least 2,500 words on an investigation of a subject selected by the student and agreed upon by the major advisor and the department chairman. Prereq.: 150 hours of degree credit completed. Conferences scheduled as required. 2+2+2 q.h.

805R. *Quantum Electronics.* Electronic energy levels in quantum electronic devices; energy transitions in crystalline and gaseous media. Applications to semiconductors, maser, and lasers. Three hrs. lecture and 3 hrs. laboratory. Prereq: EE 706, 708. 4 q.h.

807R. *Pulse, Digital, and Switching Circuits.* The generation and processing of nonsinusoidal waveforms in active and passive devices and circuits. (Pulse, digital, and switching waveforms.) Prereq.: EE 709, 702. 4 q.h.

808R. *Electronic Circuits Signals and Systems.* A continuation of Electrical Engineering 709 with emphasis on problems arising from communications and electronics areas. Correlation of classical differential equations approach to time and frequency domain interrrelationships with Fourier and Laplace methods, and applications of these concepts to problems in communications and control arts. Numerical methods, including impulse-train techniques. Prereq.: EE 709. 4 q.h.

810R, 811R. *Electrical Energy Conversion I and II.* An examination of lumped parameters electromechanics as related to Electromagnetic Field Theory; uses transducers and rotating machines to present fundamental concepts in engineering practice. Magnetic diffusion and charge relaxation fields and moving media. Must be taken concurrently with 810L and 811L, respectively. Prereq. or concurrent: EE 705. 3+3 q.h.

810L, 811L. *Electrical Energy Conversion Laboratory I and II.* Required experimental work designed to accompany the corresponding lecture courses. Must be taken concurrently with the corresponding lecture courses. 1+1 q.h.

812R. *Molecular Engineering.* Treatment of materials of electrical engineering in terms of atomic, nuclear, and molecular phenomena. Interaction between electromagnetic fields and materials; classical treatment and quantum effects; particle statistics in thermal equilibrium. Conduction in metals, semiconductors, and super-conductors; electric and magnetic polarization; ferroelectricity and ferromagnetism; electromechanical and magnetic mechanical effects; influence of material properties on energy storage, conversion, and control. Three hrs. lecture and 3 hrs. laboratory. Prereq.: EE 706, ME 641. 4 q.h.

813R, 814R. *Logic Circuit Theory I, II.* Synthesis of switching circuits using Boolean algebra, coding, combinational and sequential switching circuits. Each 3 hrs. lecture and 3 hrs. laboratory. 4+4 q.h.

815R. *Energy Radiation and Propagation.* Dipole, loop, aperture, reflector, lens, surface wave, and other antennas; array theory; radiation resistance, directivity, and input impedance traveling wave antennas. Prereq.: EE 706. 4 q.h.

817. *Control Analysis II.* Linear and nonlinear control system conpensation techniques in the time and frequency domain. Signal flow diagrams input-output control systems, compensations to eliminate the effects of parameter variations. Prereq.: EE 703. 4 q.h.

819R. *Plasma Dynamics.* The application of plasmakinetic theory; charged particle interaction; waves in plasma; plasma oscillation; magnetic fluid dynamics; plasma gyrations to electrical problems. Prereq.: EE 706, ME 641. 4 q.h.

820. *Modern Control Theory.* Introduction to the design of linear feedback control systems for minimum time response. Design of feedback system with bang-bang control and minimum fuel constraints. Design of linear system with free and semi-free configurations for minimum mean square error. Prereq.: EE 703. 4 q.h.

822. *Analog-Digital Hybrid Computation.* An examination of analog, hybrid and related digital computer techniques for solving problems associated with real physical systems. Three hrs. lecture and 3 hrs. laboratory. Prereq.: Fortran and Math. 673 or permission of the instructor. 4 q.h.

823. *Microprocessor Design and Applications.* Analysis of modern storage devices, microprocessor architecture, potential applications and limitations, implementation, peripheral devices, interfacing, and typical microcomputer applications. Prereq.: EE 813R. 4 q.h.

831. *Solar Energy Engineering.* Fundamentals of systems that use solar energy as an energy input. Analysis of collection methods and energy conversion, transmission, storage and utilization. Application examples from direct heating and cooling and electrical generation. Environmental implications of the utilization of solar energy. Prereq.: Physics 610, Math. 674, EE 714R or EE 603. 4 q.h.

832. *Solar Energy Systems, Synthesis and Optimization.* Synthesis, analysis and optimization of systems and subsystems of a solar energy installation. Small scale (residental/business) systems, direct heating and cooling and electricity generation. Large-scale solar-powered electrical generating plants/farms. Prereq.: EE 831. 4 q.h.

840. *Electric Power Systems.* Basic networks and transmission lines, balanced and

unbalanced faults; fault studies and load flow studies employing computers; control of system generation components, stability and protection of power systems. Prereq. or concurrent: EE 811R, or permission of Electrical Engineering chairman. 4 q.h.

850. *Communications Systems II.* Signal detection in noise. Averages, sampling spectral analysis, shot noise, the Gaussian process, linear systems, noise figures, optimum linear systems, nonlinear devices. The direct method. Nonlinear devices; the transform method, detection of signals. Prereq.: EE 808R. 4 q.h.

Curriculum for the Degree of Bachelor of Engineering with the Major in Electrical Engineering

The Department of Electrical Engineering offers a major in Electrical Engineering and allied fields. Electrical theories are applied to problems of energy storage, propagation, conversion, and control.

The department offers a variety of topics in which a student can specialize. These areas of specialization are as follows:

Computer Design
Control Systems
Electromagnetic Field Theory
Electronics
Energy Conversion
Power Systems
Solar Energy

The Electrical Engineering Bachelor of Engineering degree major requires 45 hours. An additional 22 quarter hours of design, synthesis, and systems; 43 quarter hours of general engineering; 24 quarter hours of basic science; 22 quarter hours of mathematics (beyond trigonometry); 24 quarter hours of social studies and humanities (eight of which must be humanities); six quarter hours of health and physical education; eight quarter hours of English (Basic Composition I and II); and seven quarter hours of electives generally in the area of science, mathematics or engineering are required. These are to be determined in consultation with an Electrical Engineering advisor.

A minor is offered by the Department of Electrical Engineering. Students desiring to minor in electrical engineering may see an electrical engineering advisor.

A quarter-by-quarter arrangement of courses for each individual student is compiled and approved in consultation with the student's electrical engineering advisor.

The student must carefully plan the program as it is currently impossible to offer each course every quarter and many courses must follow in specific sequences. Normally expected day-time offerings are:

FALL	WINTER	SPRING
601	602	603
611	612	613
701	702	703
704	705	703L
704L	705L	706
707	708	706L
707L	708L	709
810R	811R	709L
810L	811L	8XX*
8XX*	8XX*	

EVENING TRACK

An "evening track" to the degree is designed for the student who is unable to attend classes on a full-time basis. The scheduling of the Electrical Engineering courses is arranged to help the student complete the sequences as quickly as possible. The time needed is greatly reduced by careful use of all quarters, including summers. Electrical courses required for the degree Bachelor of Engineering in Electrical Engineering may be completed in about two years by following the evening track with two courses per quarter.

The sequence of EE courses will start in the summer of the odd numbered years and will follow the pattern shown below:

EVENING TRACK

	WINTER	SPRING	SUMMER I	SUMMER II	FALL
1978			704	705	706
			704L	705L	706L
					8XX*
1979	810R	601	602	603	701
	810L	611	612	613	707
	8XX*	811R	8XX*		707L
		811L			
		8XX*	Repeat two-year cycle.		
1980	702	703			
	708	703L			
	708L	709			
		709L			

Suggested Electrical Engineering Curriculum

FIRST YEAR	Hrs.
Math. 571, 572, 673 Calculus I, II, III	14

Chemistry 515, 516 General Chemistry I, II	8
ME 501 Engineering Drawing	3
General Engineering Elective	3
IE 642 Engineering Computations	4
Engineering 581	2
English 550, 551 Basic Composition I, II	8
Social Studies Elective	3
H&PE 590 Health	3
H&PE Activities	2
	50

SECOND YEAR	Hrs.
Math. 674 Calculus IV	4
Math. 705, 706 Differential Equations I, II	8
CE 601 Mechanics I	4
ME 603 Thermodynamics	4
ME 641 Dynamics	4
General Engineering Elective	3
Physics 510, 610 General Physics I, II	8
EE 601, 602, 603 Basic Circuit Theory I, II, III	9
EE 611, 612, 613 Instrumentation and Computation Laboratories I, II, III	3
H&PE Activity	1
	48

THIRD YEAR	Hrs.
EE 701, 702 Circuit Analysis I, II	6
EE 703 Control Systems Analysis	3
EE 703L Control Systems Laboratory	1
EE 704, 705, 706 Field Theory I, II, III	9
EE 704L, 705L, 706L Field Theory Laboratory I, II, III	3
EE 707, 708 Electronic Circuit Analysis	6
EE 707L, 708L Electronic Circuit Laboratory I, II	2
EE 709 Communication Systems	3
EE 709L Communication Systems Laboratory	1
Science Elective	4
General Engineering Elective	4
Social Science Electives	6
	48

FOURTH YEAR	Hrs.
EE 810R, 811R Electrical Energy Conversion I, II	6
EE 810L, 811L, Electrical Energy Conversion Laboratory I, II	2
EE Electives	20
Science Elective	4
Humanities Electives	8
Social Studies Electives	7
EE 801, 802, 803 Thesis I, II, III	6
	53

*8XX refers to an EE Elective.

Department Technical Electives

	Hrs.
EE 800 Seminar	1-4
EE 805R Quantum Electronics	4
EE 807R Pulse, Digital and Switching Circuits	4
EE 808R Electronic Circuits Signals and Systems	4
EE 812R Molecular Engineering	4
EE 813R, 814R Logic Circuit Theory I, II	8
EE 815R Energy Radiation and Propagation	4
EE 817 Control Analysis II	4
EE 819R Plasma Dynamics	4
EE 820 Modern Control Theory	4
EE 822 Analog-Digital Hybrid Computation	4
EE 823 Microprocessor Design and Applications	4
EE 831 Solar Energy Engineering	4
EE 832 Solar Energy Systems, Synthesis and Optimization	4
EE 840 Electric Power Systems	4
EE 850 Communication Systems II	4

INDUSTRIAL ENGINEERING

Professor Sorokach (chairman); Associate Professors Driscoll and Kearns; Assistant Professor Maul.

555. *Introduction to Modern Technology.* A comprehensive survey of present and projected future status of modern technology following a brief historical account of technological progress since the Industrial Revolution. Broad familiarization with technical terminology and major breakthroughs. Jointly taught with all other engineering departments. This course will be cross-listed in all five departments of the School of Engineering. 4 q.h.

642. *Engineering Computations.* Flow diagramming and problem layout of elementary engineering problems. Solutions will be obtained when possible using programmable desk calculators. Fortran language will be employed to solve a wider variety of more complex engineering problems on a digital computer. Prereq. or concurrent: Math. 674, Physics 510. 4 q.h.

700. *Industrial Organization and Management.* The general principles of industrial organization and management. Prereq. or concurrent: Math. 743 or consent of department chairman. (F) 5 q.h.

705. *Value Engineering.* The application of fundamental engineering techniques and learned skills to a variety of product designs, with objective of identifying the unnecessary costs in the designs. Prereq.: Junior standing. (W) 4 q.h.

711. *Methods I.* Fundamentals and elements of motion study. Construction and use of process charts and operations analysis. Work simplification and standardization. Characteristics of motions and basic divisions of accomplishment. Prereq. or concurrent: IE 700. (W) 3 q.h.

711L. *Methods I Laboratory.* Techniques of examining task performance from which process and other charts are constructed and analyzed with the object of work simplification. Taken concurrently with IE 711. 1 q.h.

712. *Methods II.* Tools and methods of time study. Practice in making time study observations. Determination of constant and variables. Leveling for efforts and skill allowances for delays and fatigue. Construction and use of formula standards. Time studies are made of actual plant operations. Prereq.: IE 711. (Sp) 3 q.h.

712L. *Methods II Laboratory.* Techniques of examining task performance from which time studies are made, and standard times and productivity may be determined. Taken concurrently with IE 712. 1 q.h.

715. *Industrial Engineering Analysis I.* An introduction to the engineering design process and the survey and application of quantitative methods and decision making techniques engineers apply to the design and evaluation of industrial processes and systems for assuring reliability of performance. Emphasis on the philosophy of engineering design; problem definition, search for alternative solutions and specification of the final solution. Prereq.: Math. 705. 4 q.h.

721. *Job Analysis and Evaluation.* The fundamentals and techniques of job descriptions, job specifications, salary determination, and the use of charts in setting up labor grades, locality surveys, and merit ratings for purposes of wage determinations. The mechanics of making a plant job evaluation. Prereq.: IE 700. (F) 3 q.h.

750. *Introduction to Engineering Relations.* The interaction of engineering practices and society. Regulatory considerations in the preparation and criticism of contracts and specifications. Emphasis on the interrelationship of engineering systems with law, society, and ethics. Prereq.: Junior standing. (F) 4 q.h.

800. *Production Planning and Control.* The fundamentals and techniques of planning and control required in the coordination of product engineering, production engineering, material control, expediting, purchasing, scheduling, and dispatching. Plant capacity and plant layout. Prereq.: IE 700. (W) 4 q.h.

801. *Facilities Design.* The application of engineering techniques to the analysis, design, and justification of a production facility which may be product or service oriented. Equipment selection, process flow, material flow and material handling will be considered in the design of a system which is economically feasible and compatible with the processing requirements. The system design will involve field investigation, acquisition and analysis of data, and preparation of drawings. Prereq.: IE 712, IE 800, IE 824. 4 q.h.

810. *Special Topics.* Special topics and new developments in Industrial Engineering. Subject matter, credit hours, and special prerequisites to be announced in advance of each offering. Prerequisites: Senior standing in Industrial Engineering or consent of instructor. 1-4 q.h.

820. *Quality Control.* Objective of statistical quality control in manufacturing through sampling methods. Control charts for variables attributes, and defects per unit. A statistical approach to acceptance procedures. Applications of statistical quality control to various types of manufacturing operations. Prereq. or concurrent: Math. 743. (Sp) 5 q.h.

824. *Engineering Economy.* An introduction to the analysis and evaluation of factors that affect the economic success of engineering projects. Topics include basic accounting, interest, depreciation, cost classification, comparison of alternatives, make-buy decisions, and replacement models. Prereq.: Math. 673. (W) 4 q.h.

825. *Advanced Engineering Economy.* An extension and application of the topics considered in Industrial Engineering 824. Such extensions will be applied to such areas as decisions under assumed certainty, decisions under risk, replacement policies, bidding and purchasing policies. Prereq.: IE 824, and Math. 743. (Sp) 4 q.h.

827. *Industrial Engineering Analysis.* The use of algorithmic and simulation languages in the solution of complex engineering problems. Intended to provide background and techniques for the solutions of such problems numerically. Deterministic models of linear and non-linear systems will be considered. Simulation of inventory, queueing, and material handling systems will be examined. Prereq.: IE 642, Math. 743. (Sp) 5 q.h.

841-842-843. *Industrial Engineering Thesis.* The student prepares a written report of at least 2,500 words on an investigation of a subject selected by the student and agreed upon by the major advisor and the department chairman. Prereq.: 150 hours of degree credit completed. Conferences scheduled as required. 2+2+2 q.h.

850. *Introduction to Operations Research.* An introduction to the techniques used in operations research in the formulation of deterministic models used in the analysis of various industrial engineering problems. Inventory, scheduling, queueing, replacement, transportation, and assignment models will be considered. Prereq.: IE 700, Math. 743. (F) 4 q.h.

851. *Linear Programming.* Model formulation and the development of algorithms for the solution of linear type problems encountered in industrial engineering. The Simplex technique, revised simplex technique, duality, and degeneracy will be considered. Decomposition techniques will be introduced. Preq.: IE 700. (W) 4 q.h.

Curriculum for the Degree of Bachelor of Engineering with the Major in Industrial Engineering

FIRST YEAR	Hrs.
Math Calculus I, II	9
Physics General I	4
English Basic Composition I, II	8
Social Studies Electives	9
ME 501 Engineering Drawing	3
Engineering 581	2
Health and Physical Education Activities	3
Chem General I, II	8
Health and Physical Education 590	3
	49

SECOND YEAR	Hrs.
Math Calculus III, IV	9
Math Differential Equations I	4
Physics General II	4
IE 642 Engineering Computations	4
CE 601, 602, 603 Mechanics I, II, III	12
Basic Science Elective	8
MAT SCI 606 Materials	4
Humanities Elective	4
	49

THIRD YEAR	Hrs.
Math Statistics I	4
IE 700 Indust. Org. and Mgmt	5
IE 711, 712 Methods I, II and Labs	8
IE 715 Analysis I	4
IE 721 Job Evaluation	3
IE 705 Value Engineering	4
IE 824 Engineering Economy	4
IE 825 Advanced Engineering Economy	4
ME 603 Thermodynamics	4
ME 641 Dynamics	4
EE 714R Elec. Engr.	4
Social Studies Elective	3
	51

FOURTH YEAR	Hrs.
IE 841, 842, 843 Thesis I, II, III	6
IE 750 Intro. Engineering Relations	4
IE 800 Production Planning	4
EE 715R Elect. Engineering	4
IE 820 Quality Control	5
IE 827 Ind. Engr. Analysis	5
IE 850 Intro. Operations Research	4
IE 851 Linear Programming	4
IE 801 Facilities Design	4
Social Studies Electives	4
Engineering Elective	4
Humanities Elective	4
	52

MECHANICAL ENGINEERING

Professors D'Isa (chairman), Tarantine and Pejack; Associate Professors Morris and Petrek; Assistant Professors Arnett and Damshala.

500. *Drawing Fundamentals.* Instruction in the use of drafting instruments. Introduction to blueprint reading, orthographic projection, freehand sketching, sections, conventions, auxiliary and pictorial drawing. Intended for students who have not had at least one year of high school drawing or the equivalent in drafting experience. Not applicable for credit toward the Bachelor of Engineering degree. 3 q.h.

501. *Engineering Drawing.* Applications of orthographic projection, auxiliary and oblique views, and sections and conventions: dimensioning: detail and assembly drawings. Graphs and graphic computations. Prereq.: ME 500 or equivalent. 3 q.h.

504. *Graphic Science and Design.* Principles of conceptual design. Fundamentals of descriptive geometry including intersections and developments. Charts, graphs, nomographs, graphical computations. Six hours of combined lecture and laboratory per week. Prereq. or concurrent: ME 501. 4 q.h.

555. *Introduction to Modern Technology.* A comprehensive survey of present and

projected future status of modern technology following a brief historical account of technological progress since the Industrial Revolution. Broad familiarization with technical terminology and major breakthroughs. Jointly taught with all other engineering departments. (Identical with ChE 555, CE 555, EE 555, IE 555, and MAT SCI 555.) 4 q.h.

580. *Basic Engineering Concepts.* An introduction to the engineering career and its role as a profession. Discussion of the preparation of an engineering career, including some of the tools of analysis such as slide rule, error analysis, sketching, and computers. Introduction to the various aspects of the engineering design process and problem solving. 3 q.h.

603. *Thermodynamics I.* Thermodynamic properties of gases and vapors and their relationships in energy transformations. The first law; equations of state; compression and expansion processes; entropy; the second law. Introduction to thermodynamic cycles and efficiencies of power plants and other devices. Prereq. or concurrent: Math. 673. 4 q.h.

604. *Thermodynamics II.* Availability and irreversibility in thermodynamic processes and cycles; relations among thermodynamic properties. Mixtures and solution; psychometry. Introduction to phase and chemical equilibrium. Prereq.: ME 603. 4 q.h.

641. *Dynamics.* Basic relationships of the kinematics of particles and rigid bodies. Kinetics of particles, groups of particles, and rigid bodies using Newton's laws of motion, work-energy and impulse-momentum techniques. Vector notation used where applicable. Prereq.: CE 601. 4 q.h.

720. *Heat Transfer I.* A study of the fundamental laws of heat conduction. Steady and unsteady-state one- and two-dimensional conduction problems solved both analytically and numerically. Three hours lecture and two hours laboratory per week. Prereq.: Math. 706, IE 642, or concurrent: ME 604. 4 q.h.

721. *Heat Transmission.* The fundamentals of heat transfer by conduction, convection, and radiation, followed by investigations of combinations of these modes of heat transfer. (Not intended for students having ME 720.) Prereq.: Math. 705. 4 q.h.

731. *Thermofluid Mechanics.* The fundamentals of incompressible fluid flow, including applications of the momentum equation and Bernoulli's equation to flow through pumps, pipe networks, and open channels; loss coefficients. Review of the first law of thermodynamics; thermodynamic processes and cycles; the concept of entropy and the second law of thermodynamics. Intended as (1) a review course for transfer students from other baccalaureate mechanical engineering programs; (2) a review course for entering students who have completed a two-year mechanical engineering technology program; and (3) a refresher course for practicing engineers. Prereq. or concurrent: Math. 673 and consent of department chairman. 4 q.h.

750. *Strength of Materials III.* Analysis (including Mohr circle representation) of stresses and strains at a point. Introduction to classical elasticity; boundary value problems in rectangular Cartesian and cylindrical polar coordinates, energy method of Castigliano. Prereq.: CE 603 or concurrent: Math. 706. 3 q.h.

800. *Special Topics.* Special topics and new developments in mechanical engineering. Subject matter, credit hours, and special prerequisites to be announced in advance of each offering. May be repeated to a maximum of eight credit hours. Prereq.: Junior standing in mechanical engineering or consent of instructor. 1-4 q.h.

801-802-803. *Mechanical Engineering Thesis.* The student prepares a written report on an investigation of a subject selected by the student and agreed upon by the major advisor and the department chairman. Prereq.: 150 hours of degree credit completed. Conferences scheduled as required. 2+2+2 q.h.

804. *Applied Thermodynamics.* Application of principles of thermodynamics to power, refrigeration, and energy conversion devices. Optimization and design of thermal systems. Prereq.: ME 604. 4 q.h.

804L. *Applied Thermodynamics Laboratory.* Experiments involving basic measurement techniques, power and refrigeration cycles, and other thermodynamic phenomena. Analysis of fossil fuels. Prereq. or concurrent: ME 604. 1 q.h.

810. *Introduction to Biomedical Engineering.* Applications of engineering principles to the human body and to systems of the body. Topics introduced will include the respiratory, cardiovascular and digestive systems, along with temperature regulation mechanisms and prosthetics. Prereq.: Senior standing or consent of instructor. 4 q.h.

821. *Heat Transfer II.* A study of the fundamental principles of heat transfer by convection and radiation. Empirical relations for forced and natural convection systems. Condensation and boiling heat transfer. Heat exchangers. Radiation problems including the influence of both the material properties and the geometrical arrangement of the bodies involved. Three hours lecture and two hours laboratory per week. Prereq.: ME 720. 4 q.h.

822. *Internal Combustion Engines.* Thermodynamics analysis of internal combustion engine and gas turbine cycles; fuels, carburization, emissions, and the effect of supercharging on internal combustion engine performance. Prereq.: ME 604, Math. 706. 3 q.h.

823. *Refrigeration and Air Conditioning.* The application of thermodynamic, fluid flow, and heat transfer principles to domestic and industrial refrigeration systems for purposes of material processes and human comfort. Prereq.: ME 604. 3 q.h.

824. *Thermofluid Processes in Environmental Systems.* Analysis of heat, mass, and momentum transport in environmental, geophysical, and ecological processes. Design applications include systems for waste heat removal, solid particulate control, and thermal regulatory devices. Discussion of measurement techniques. Prereq.: ME 721 or 821, or consent of instructor. 4 q.h.

830. *Fluid Mechanics.* The theory of one-dimensional compressible flow. The control volume approach to the conservation of mass, energy, and momentum integral equations. An introduction to differential analysis and non-viscous flow theory. Prereq.: CE 716 or concurrent: Math. 706. 4 q.h.

830L. *Fluid Mechanics Laboratory.* Experiments on compressible fluid flow in the subsonic and supersonic regions. Taken concurrently with ME 830. 1 q.h.

842. *Dynamics of Machinery.* Application of analytical mechanics with particular emphasis on machines. Gyroscopic motion analysis and other advanced topics. Prereq.: ME 641. 4 q.h.

851. *Strength of Materials IV.* Theories of failure for metals. Introduction to plasticity, creep, impact, and fatigue of metals. Prereq.: ME 750. 4 q.h.

851L. *Strength of Materials IV Laboratory.* Static and dynamic electrical strain gage applications. Introduction to photoelasticity. Theory of brittle lacquers. Prereq. or concurrent: ME 750. 1 q.h.

860. *Machine Design I.* The design and use of machine elements such as shafts, keys, couplings, springs, screws, and welded connections. Prereq.: ME 750. 3 q.h.

860L. *Machine Design I, Laboratory.* Practical design problems, each incorporating the design of several machine elements. Taken concurrently with ME 860. 1 q.h.

861. *Machine Design II.* A continuation of Machine Design I, including brakes, clutches, belts; lubrication; ball and roller bearings; spur, bevel, worm, and helical gears; and flywheels. Selected application of Castigliano's Theorem. Prereq.: ME 860, 860L. 3 q.h.

861L. *Machine Design II, Laboratory.* Practical design problems involving all of the subjects covered in Machine Design I and II. Specifications for gearing and materials are introduced in the design problems. Taken concurrently with ME 861. 1 q.h.

862. *Human Factors in Mechanical Design.* A mechanical design course emphasizing aesthetics, safety, and the comfort of the human body as criteria; human sensory processes as design factors; topics such as vehicular safety devices, prostethic devices, and household appliances are considered. Prereq. or concurrent: ME 750. 4 q.h.

870. *Mechanical Vibrations.* The behavior of the lumped system with one and two degrees of freedom including applications (such as: vibration isolation, Seismic instruments, etc.). Methods of analyzing lumped systems with many degrees of freedom. Prereq.: CE 603, ME 641, Math 706. 4 q.h.

870L. *Mechanical Vibrations Laboratory.* Experiments involving mechanical systems and some electrical analogies. Analog computer simulation of vibration systems is introduced. Taken concurrently with ME 870. 1 q.h.

872. *Engineering Acoustics.* The nature of sound and its propagation; analysis and control of sound and noise production in mechanical equipment; transmission and absorption of sound in engineering materials, ultrasonics, structural acoustics, basic measurements and equipment. Prereq.: ME 641. 4 q.h.

872L. *Engineering Acoustics Laboratory.* Applications of acoustics instrumentation such as sound level meters, filters, frequency analyzers, level recorders and tape recorders

to problems involving room acoustics, sounds in pipes, noise barriers and machinery noise. Taken concurrently with ME 872. 1 q.h.

881. *Engineering Analysis.* An integration of the fundamental facts, principles, and laws of mathematics, science and engineering, and their utilization in a rigorous training in methods of analysis and solutions of engineering problems. Prereq.: Math. 705, ME 641, senior-level standing. 4 q.h.

882. *Mechanical Engineering Problems.* Modeling, design, and analysis of mechanical engineering devices or systems utilizing modern methods and techniques. Solution of problems by use of analytical, numerical, and statistical techniques. Prereq: IE 642, Math. 706, senior-level standing. 4 q.h.

892. *Control Theory.* Introduction to the principles of automatic control of electro-mechanical and hydraulic systems using Laplace transform methods. Discussion of system stability. Prereq.: Math. 706. 4 q.h.

Curriculum for the Degree of Bachelor of Engineering with the Major in Mechanical Engineering

FIRST YEAR	Hrs.
Math. 571, 572 Calculus I, II	9
Physics 510, 610 General Physics I, II	8
English 550, 551 Basic Composition I and II	8
ME 501 Engineering Drawing	3
ME 504 Graphic Sci. & Design	4
IE 642 Engineering Computations	4
Engineering 581	2
ME 580 Basic Engineering Concepts	3
Health and Physical Education 590 Health Education	3
H&PE Activity	3
Elective (Social Studies)	4
	51

SECOND YEAR	Hrs.
Math. 673, 674 Calculus III, IV	9
Math. 705 Differential Equations I	4
Physics 611, General Physics III	4
CE 601, 602, 603 Mechanics I, II, III	12
ME 603, 604 Thermodynamics I, II	8
ME 641 Dynamics	4
Chem. 515, 516 General Chemistry I, II	8
	49

THIRD YEAR	Hrs.
Math. 706 Differential Equations II	4
ME 705 Strength of Materials III	3
ME 860, 860L Machine Design I, Lab	4
EE 714R, 715R Circuits and Electronics, Electrical Devices	8
CE 716 Fluid Mechanics	4
ME 720 Heat Transfer or ME 721 Heat Transmission*	4
MatSci 606 Engineering materials	4
Sociology 789 Man and the Technological Society	4
IE 824 Engineering Economy	4
Elective (Social Studies)	3
Elective (Mechanical Engineering)	5
Elective (Science)	4
	51

FOURTH YEAR	Hrs.
ME 801, 802, 803 Thesis	6
ME 881 Engineering Analysis	4
Elective (Social Studies)	5
Elective (Humanities)	8
Electives (Mechanical Engineering)	26
	49
Total	**200**

ELECTIVES

Departmental Electives	Hrs.
800 Special Topics	1-4
804 Applied Thermodynamics	4
804L Applied Thermodynamics Laboratory	1
ME 810 Introduction to Biomedical Engineering	4
821 Heat Transfer II	4
822 Internal Combustion Engines	3
823 Refrigeration and Air Conditioning	3
824 Thermofluid Processes in Environmental Systems	4
830 Fluid Mechanics	4
830L Fluid Mechanics Laboratory	1
842 Dynamics of Machinery	4
851 Strength of Materials IV	4
851L Strength of Materials IV Laboratory	1
861 Machine Design II	3
861L Machine Design II Laboratory	1
862 Human Factors in Mechanical Design	4
870 Mechanical Vibrations	4
870L Mechanical Vibrations Laboratory	1
872 Engineering Acoustics	4
ME 872L Engineering Acoustics Laboratory	1
882 Mechanical Engineering Problems	4
892 Control Theory	4

At least four ME laboratory courses are required as electives. ME 821 may be included for laboratory credit.

*Students electing ME 720 are expected to take ME 821 as an ME elective.

Areas of Specialization

Each student is required to concentrate at least seventeen (17) of the Mechanical Engi-

neering elective hours in an area of specialization.

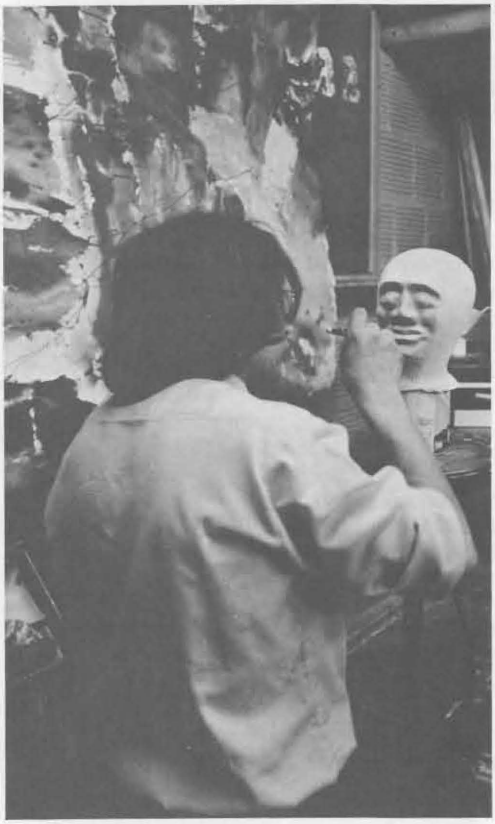
Three ongoing specialty areas offered are: Mechanics of Rigid and Deformable Solids (ME 842, ME 851*, ME 851L, ME 861*, ME 861L, ME 862, ME 870* and ME 870L), Heat and Fluid Flow (ME 804*, ME 804L, ME 821*, ME 822, ME 823, ME 824, ME 830* and ME 830L), and Energy and Environment (ME 804, ME 804L, ME 822, ME 823, ME 824, ME 862, ME 872 and ME 872L). If one of the first two of these areas is selected for specialization, the courses followed by an asterisk (*) are required in the area.

Two additional specialty areas are available with individual approval by the department curriculum committee: Biomedical Studies and Plant Engineering. Interested students should consult their faculty advisor for a program of courses.

With the Energy and Environment, Biomedical Studies, and Plant Engineering specialty areas, certain select out-of-department courses, not to exceed eight (8) quarter hours, may be approved by the department curriculum committee as substitution for Mechanical Engineering electives.

Transition Programs

Students wishing to transfer to the Mechanical Engineering baccalaureate degree program from any two- or four-year academic program should consult the department chairman for special counseling. The department has developed transition programs designed to utilize the student's previously acquired knowledge and minimize the time required to fulfill the Bachelor of Engineering degree requirements.



College of Fine and Performing Arts

William R. McGraw, Dean

ORGANIZATION AND DEGREES

The College of Fine and Performing Arts consists of the Department of Art, the Department of Speech Communication and Theatre, and the Dana School of Music. The degrees granted include the Bachelor of Arts (A.B.), Bachelor of Music (Mus.B.), Bachelor of Fine Arts (B.F.A.), and Bachelor of Science in Education (B.S. in Ed.) in conjunction with the School of Education.

The activities of the College are conducted primarily in the new Fine and Performing Arts Center, Bliss Hall. This 6.5 million dollar structure houses the administrative offices of the College as well as classrooms, studios, laboratories and performance areas serving most of the curricular and co-curricular programs in Art, Speech Communication/ Theatre and Music. Additional activities are held in the Dana Recital Hall, Stambaugh Auditorium, Powers Auditorium, and Clingan-Waddell Hall.

REQUIREMENTS FOR DEGREES

PRE-COLLEGE

SUBJECT	HIGH SCHOOL UNITS			
	A.B.	Mus.B.	B.F.A.	B.S. in Ed.
English	3	3	3	3
U.S. History and Civics	1	1	1	1
Foreign Language	2	—	—	—
Algebra	1	—	—	—
Geometry	1	—	—	—
Math (any)	—	1	1	1
Science	1	1	1	1
Others*	7	10	10	10

*French, German or Italian is recommended for the student intending to major in voice.

Musical performance ability adequate for undertaking college-level music courses.

IN THE UNIVERSITY
COURSE REQUIREMENTS FOR THE B.F.A. AND MUS.B. DEGREES*

BASIC COURSES	Quarter Hours of Credit
English 550-551	8
Health and Physical Education 590	3
Health and Physical Education activity courses	3

AREA COURSES

SOCIAL STUDIES 16-22

Course work in two or more of the following departments: Economics, Geography (excluding 503, 603, 625, and 730 which are applicable to the science requirement), History, Political Science, Psychology, Sociology, Black Studies, and Social Science.

HUMANITIES 8-18

Course work in two or more of the following areas: Literature courses in English, foreign language; course work in the Department of Philosophy and Religious Studies; or history and/or appreciation courses in the College of Fine and Performing Arts.

SCIENCE/MATHEMATICS 12-22

This requirement includes a minimum of 8 hours of science.

PROFESSIONAL COURSES

These are listed under the appropriate department or school curriculums.

REQUIREMENTS IN ADDITION TO COURSES

Upper Division status (including completion of any specified preparatory units lacking at entrance)
Major and minor requirements
Course-level requirements
Point index requirement
Residence requirement
Completion of quarter hours appropriate to the degree
Application for graduation

*For A.B. and B.S. in Ed. requirements, see appropriate sections of this catalog.

COURSES OF INSTRUCTION AND CURRICULUMS‡

ART

Professor Naberezny; Associate Professors Babisch, Bright, Ives, Juhasz, Lepore, Lucas, Maddick, Mitchell, Walusis, Zonal (Chairman); Assistant Professors Ryska and Ulrich, Instructors Fantauzzi and Moseley.

The Department of Art offers courses which will satisfy major requirements in art for the degrees of Bachelor of Fine Arts, Bachelor of Arts, Bachelor of Science in Education, and Associate in Arts.

For the Bachelor of Fine Arts degree, the program in studio arts is designed to familiarize the student with the basic concepts in art and the language of form. Concentration is given to the development and involvement of the student with the processes and practices of art. A minimum of 186 quarter hours is required for the B.F.A. degree. The curriculums for the studio arts majors are listed below.

For the Bachelor of Arts degree, the curriculums in art history, studio art and commercial art are listed below. The art history major is required to complete a minimum of 45 quarter hours beyond the 500 level. The studio art major is required a minimum of 81 quarter hours of art and the commercial art major a minimum of 79 quarter hours.

Students majoring in art who wish to qualify for the Provisional Special Certificate in art are required a minimum of 79 quarter hours, of which at least 18 are to be in art history. These students, after completing two years of satisfactory study (a point average of at least 2.40), may apply for admission to the School of Education. (Other requirements for admission are listed under the School of Education section.) NOTE: No minor is required for the Special Certificate.

A student wishing to acquire a teaching field in art which will qualify the student for high school teaching only will find a curriculum of courses listed below. Education requirements for this teaching field may be acquired from the School of Education.

‡The student should be familiar with the course-numbering system and its significance, as well as the abbreviations used to indicate the amount of credit. These are explained at the end of the General Requirements and Regulations section.

BACHELOR OF FINE ARTS CURRICULUM

The major areas to which the B.F.A. degree applies are painting, sculpture, printmaking, commercial art, crafts and general art.

General University requirements for this degree may be found at the beginning of the College of Fine and Performing Arts section.

All studio arts majors are required to complete the following courses:

		q.h.
510	Color & Design I	4
511	Color & Design II	4
513	Survey of Western Art I	3
514	Survey of Western Art II	3
600	Theory of Art	3
601	Drawing	3
602	Drawing Techniques	3
606	Painting I	4
611	Woodblock/Monoprint *or*	
612	Serigraphy	4
623	Graphic Design I	3
705	Advanced Drawing	3
	Art History Electives	9

In addition to the above list, specific courses for each major are listed below.

STUDIO ART (PAINTING MAJORS)

		q.h.
703	Painting II	5
803	Painting III	10
800	Studio Prob. (Painting)	10
	Studio options	19
	General electives	36

STUDIO ART (SCULPTURE MAJORS)

		q.h.
725	Ceramics I	3
730	Sculpture I	4
731	Sculpture II	5
812	Sculpture III	10
800	Studio Prob. (Sculpture)	10
	Studio options	12
	General electives	36

STUDIO ART (PRINTMAKING MAJORS)

		q.h.
611	Woodblock/Monoprint	4
612	Serigraphy	4
721	Printmaking (Lithography)	4
722	Advanced Serigraphy	5
780	Photography I	4
821	Printmaking (Etching)	5-10
800	Studio Prob. (Printmaking)	10
	Studio Options	7
	General Electives	36

STUDIO ART (COMMERCIAL ART)

		q.h.
624	Graphic Design 2	3
625	Graphic Design 3	3
716	*or* 717 Interior Design	3
727	Graphic Design 4	3
728	Graphic Design 5	3
729	Graphic Design 6	3
750	*or* 751 Architectural Des.	3
780	Photography I	4
800	Studio Problems	10
	Studio Options	9
	General Electives	36

STUDIO ARTS (CRAFTS MAJORS)

		q.h.
725	Ceramics I	3
726	Ceramics II	3
767	Arts & Crafts	3
770	Jewelry I	4
771	Jewelry II	4
810	Advanced Ceramics I	3
811	Advanced Ceramics II	3
822	Puppetry & Stage Des.	3
823	Fabrics & Weaving	3
800	Studio Problems	3
	Studio Options	5
	General Electives	36

STUDIO ART (GENERAL ART MAJORS)

		q.h.
800	Studio Problems	10
	Studio options	34
	General electives	36

BACHELOR OF ARTS CURRICULUMS

See General Requirements at the beginning of the Arts and Sciences section.

Studio Art

Required Courses—Art 510, 511, 513, 514, 600, 601, 602, and at least 58 quarter hours of art electives of which nine are to be in art history.

ART HISTORY

Required Courses—Art 513, 514, 600 (Philosophy 710), and 38 hours of Art History Electives.

COMMERCIAL ART

Required courses—Art 510, 511, 513, 514, 600, 601, 602, 611 *or* 612, 623, 624, 625, 705, 716 *or* 717, 727, 728, 729, 750, 780, 800 and nine hours of Art History Electives.

BACHELOR OF SCIENCE IN EDUCATION CURRICULUMS

See General Requirements at the beginning of the School of Education section.

PROVISIONAL SPECIAL CERTIFICATE IN ART EDUCATION

Required Courses—510, 511, 513, 514, 600, 601, 602, 606, 611 *or* 612, 623, 716 or 750, 724, 725, 730, 760, 767, 770, 801, 822 *or* 823, and 17 hours of Art electives of which nine hours are to be in Art History. Art 801 must be taken during the senior year.

Provisional High School Certificate in Art Education

Required Courses—Art 510, 511, 513, 514, 601 or 602, 611 or 721 or 821, 606 or 623, 770,767,716 or 750, 724, 725, 730, and five or six hours of art electives.

NOTE: Art 724 (School Arts—Secondary) substitutes for Ed. 800 as the special methods course; counted as a professional course.

Lower Division Courses

510. *Color and Design I.* Two-dimensional experiments with various kinds of materials and media. A study of the formal elements and their present-day relationships. Six hours lab. (F,W,Sp,Su) 4 q.h.

511. *Color and Design II.* Three-dimensional experiments with various kinds of materials. Utilization of the formal elements in three-dimensional design. Eight hours lab. Prereq.: Art 510. (W,Sp) 4 q.h.

513. *Survey of Western Art I.* Introduction to the principles of art; the media, techniques, terminology, and value judgment in fine arts outlined. Survey of art in western culture from prehistoric and ancient periods to 1150. 3 q.h.

514. *Survey of Western Art II.* From middle ages through Renaissance and Baroque-Rococo periods to the end of the 19th century. (W,Sp) 3 q.h.

515. *Survey of Non-Western Art.* Survey of art in pre-Columbian Americas, India, China, Africa, Japan, and Oceania from their beginnings to approximately 15th century. Attention is given to the philosophical and religious background information. (Sp) 3 q.h.

600. *Theory of Art.* An examination of the theories and philosophical implications of form in the visual arts with emphasis on con-

temporary thought. Required of all art and art education majors. Prereq.: Art 513 and 514. (W, Sp) 3 q.h.

601. *Drawing.* Traditional study of the human figure and objects. Attention to the significance of line, the relation of shapes and their organization in established space. Perspective as it pertains to two-dimension studies in the visual arts. Six hours lab. Prereq.: Art 510. 3 q.h.

602. *Drawing techniques.* An exploration of the expressive and organizational functions of the elements of drawing through varied media and techniques. Six hours lab. Prereq.: Art 510. 3 q.h.

606. *Painting I.* Experimenting with old and new techniques in painting. The student is encouraged to see significantly rather than imitatively, and to develop an explorative interest in techniques. Eight hours lab. Prereq.: Art 601 or 602. (F, W, Sp, Su) 4 q.h.

610. *Color & Design III.* A review and continuing study of design concepts. Studio problems in advanced composition and the utilization of color as a primary structural element. Required of all Studio Art majors. Six hours lab. Prereq.: Art 510. 3 q.h.

611. *Woodblock & Mono Printing.* Experimenting with woodblock and mono printing techniques. One hour lecture; seven hours lab. Prereq.: Art 601 or Art 602. 4 q.h.

612. *Serigraphy.* Experimenting with silk-screen techniques. One hour lecture; seven hours lab. Prereq.: Art 601 or Art 602. 4 q.h.

623. *Graphic Design I.* Introduction to Art in Advertising, such as trademarks, symbols, letterheads, logotypes, posters, billboards, magazine ads, packaging, illustrations and television commercials. Creative thinking will be emphasized along with techniques and media necessary for producing ideas visually. One-hour lecture; five hours Lab. Student is advised to take Art 611 (Printmaking). Prereq.: Art 510. 3 q.h.

624. *Graphic Design 2.* Introduction to the practice of techniques and tools used in the production of layouts in design and illustration. Emphasis on type, perspective use of grid for reductions, enlargements, distortions, and exact renderings will be developed. Limitations will be placed on color expenses, and deadlines. One-hour lecture; five hours lab. Student is advised to take Art 611 (Printmaking). Prereq.L Art 623. 3 q.h.

625. *Graphic Design 3.* Problem-solving experiences and practice of type and their use. Designing types and using established type styles to create purely typographic layouts. One-hour lecture; five hours lab. Student is advised to take Art 780 (Photography I). Prereq.: Art 624. 3 q.h.

Upper Division Courses

703. *Painting II.* Continuation of individual exploration of techniques and development of personal tendencies. Ten hours lab. Prereq.: Art 606. (F,W,Sp,Su). 5 q.h.

705. *Advanced Drawing.* Study in composition, space division, the plastic means. Six hours lab. Prereq.: Art 601 or 602. (W,Sp) 3 q.h.

706. *Renaissance Art.* Review of formalism, mysticism, and classicism; the new humanism from 1400 to 1575. Studying the great artists and their connection with the history and philosophy of the times. 3 q.h.

707. *United States Art.* Development of the fine arts in the United States from the Colonial period till the advent of Modern movement (1913). Lectures and slides will include the developments of painting, sculpture, architecture, and the minor arts. Prereq.: Art 514. 3 q.h.

708. *Baroque/Rococo Art.* Study of European art from 1575 to 1800; styles and trends developed from the Renaissance. Survey of the academic, eclectic, natural, and classicist movements. 3 q.h.

709, 710, 711. *History and Appreciation of Art and Music I, II, and III* (General). Illustrated lectures on art and music to develop the cultural growth of the non-art and non-music student. A survey of the art and musical forms, comparisons of compositional styles and discussion of the developments, influences, and experiments of the important periods to date. No prior training in art or music required. (Not intended for art majors.) Listed also as Music 709, 710, 711. (F,W,Sp,Su) 4+4+4 q.h.

712. *Medieval Art.* Survey of Early Christian, Byzantine, Romanesque, and Gothic painting, sculpture, and architecture. 3 q.h.

713. *Nineteenth Century European Art.* Survey of the important movements of the nineteenth century with special attention to the artists of neoclassicism, romanticism, realism, and naturalism. 3 q.h.

714. *Ancient Art I.* A survey of the art and architecture of the ancient Near East and especially of Greece into the classical period, with attention to the civilizations in which they were produced. No previous training in art or ancient languages is required. Listed also as Classical Studies 714. (W,Sp) 3 q.h.

715. *Ancient Art II.* The art and architecture of classical and Hellenistic Greece and the Roman world, and their relation to the civilizations in which they were produced and to earlier art. No previous training in art or ancient languages is required. Listed also as Classical Studies 715. (W,Sp) 3 q.h.

716, 717. *Interior Design I and II.* Study of furnishings, new designs, and textiles. Application of these and experiences from Art 510 to rooms and other interiors. Six hours lab. Prereq.: Art 510. Art 716 is prerequisite to Art 717. (F,Sp) 3+3 q.h.

721. *Printmaking II.* Concentrated experiments with lithographic techniques. Eight hours lab. Prereq.: Art 611 or permission. (W) 4 q.h.

722. *Advanced Serigraphy.* A continuation of experimentation with silkscreen printing, including the Photo Silkscreen method. One hour lecture; nine hours lab. Prereq.: Art 612 and Art 780. 5 q.h.

724. *School Arts (Secondary).* Study of the needs of children from grade eight through twelve and the means of providing desirable art experiences. Required of all art education majors. Prereq.: Art 760. (W) 3 q.h.

725, 726. *Ceramics I and II.* Pottery shaping through coiling, slab, pinching, and pottery wheel; mold making and casting; bas-relief. Six hours lab. Prereq.: Art 511. Art 725 is prerequisite to 726. (F,W,Sp,Su) 3+3 q.h.

727. *Graphic Design 4.* Creative approach to two-dimensional design, visually expressing advertisements for promotional brochures, self-mailers, logotypes, symbology and trademarks. Special problems using die cuts, folding and binding will be covered. Proper labeling in the use of crop marks, register marks and color overlays will be emphasized. One-hour lecture; five hours lab. Student is advised to take Art 721 and Art 781. 3 q.h.

728. *Graphic Design 5.* Creative and technical applications to book, mechanical and advertising illustrations. Projects to be covered will utilize both approaches as applied to descriptive illustrations for educational purposes. One-hour lecture; five hours lab. Student is advised to take Art 721 and Art 781. Prereq.: Art 727. 3 q.h.

729. *Graphic Design 6.* Emphasis on three-dimensional sculptural qualities in Graphic Design such as packaging. Display and exhibition areas will be executed through work-ups and finished models. One-hour lecture; five hours lab. Prereq.: Art 728. 3 q.h.

730. *Sculpture I.* Special problems dealing with form in space. Concentrated experiments with wood, plaster, or stone techniques. Eight hours lab. Prereq.: Art 511. (W) 4 q.h.

731. *Sculpture II.* Special problems dealing with form in space. Concentrated experiments with metal techniques. Ten hours lab. Prereq.: Art 511. (W) 5 q.h.

740. *Northern Renaissance.* Origin of the Northern Renaissance styles of painting, architecture, and the minor arts in Flanders and Northern Europe. (1300 to 1500.) Prereq.: Sophomore standing. 3 q.h.

742. *African Art* (Also listed under Black Studies). Study of African tribal art forms and their relationship to the historical period in which they were created. The impact and influence of African Art on the development of contemporary Western art trends. Prereq.: Sophomore standing. 3 q.h.

745. *Pre-Columbian Art.* An examination of the various cultural and tribal arts in the Americas. The course concentrates on the high cultures of Middle-America, such as Olmec, Maya and Aztec, and surveys artistic expression in North and South America. Prereq.: Sophomore standing 3 q.h.

750, 751. *Architectural Design I and II.* Basic drafting room practice; conventional representation, geometric construction, orthographic and oblique projection, sectioning, isometric drawing and house plans. For the prospective art teacher. Not accepted for credit toward the Bachelor of Engineering degree. Six hours lab. Prereq.: Art 511. Note: Art 750 is prerequisite to 751. (W) 3+3 q.h.

760. *School Arts.* Study of the needs of children from kindergarten through grade seven and the means of providing desirable art experiences. Experience with contemporary trends in all aspects of art education. Two hours lecture; four hours lab. Satisfies the teaching of art methods. Required of all elementary education majors and art education majors. Prereq.: Sophomore standing. (F,W,Sp,Su) 4 q.h.

767. *Arts and Crafts.* Activities and experiments with various art materials, processes and procedures and their application in attaining objectives of art education. Organized as a laboratory workshop with opportunity for students to increase their own abilities at expression and creativeness with simple art materials, and to understand their use in developing creative and expressive activities with children. Required of all elementary education majors. Six hours lab. Prereq.: Sophomore standing. (F,W,Sp,Su) 3 q.h.

770. *Jewelry I.* A study of the basic methods of fabrication used in the creation of jewelry. A concentration on design as applied to the hand processes in the shaping of various metals. Eight hours lab. Prereq.: Art 511. 4 q.h.

771. *Jewelry II.* A study of the casting processes used in the creation of jewelry. Eight hours lab. Prereq.: Art 511. 4 q.h.

780. *Photography I.* Lecture and lab course in photographic fundamentals, developing, and copy enlargers. Technical and visual knowledge relating to the photograph as an expressive art form. (Student must provide camera.) Two hours lecture; six hours lab. Prereq.: Art 510 or permission. 4 q.h.

781. *Photography II, Color.* Lecture and lab, course with emphasis on color printing, color films, and exposure. (Student must provide camera and supplies.) Eight hours lab. Prereq.: Art 780. 4 q.h.

782. *Photography III.* Lecture and lab course for the intermediate photographer. Course offers continued development of photographic craft and vision in black and white and/or color photography. Includes: Introduction to large format films; sheet film development and printing; and multi-media visual communication. Eight hours lab. Prereq.: Art 781. 4 q.h.

783. *Photography 4.* A continuation of Photography 780 with emphasis on refinement of the student's creative and technical abilities. One-hour lecture; seven hours lab. Student must provide camera and supplies. Prereq.: Art 780. 4 q.h.

784. *Photography 5.* A continuation of Photography 781 with emphasis on competence in color theory, technique and creative manipulation of recent color processes. One-hour lecture; seven hours lab. Student must provide camera and supplies. Prereq.: Art 781. 4 q.h.

800. *Studio Problems.* Continued independent experiments in any two- or three-dimensional studio discipline. A portfolio or slides of the students' previous work in the elected area of study must be presented to the department chairman no later than the fifth week of the previous quarter. A committee of art faculty appointed by the chairman will review the students' work and make its recommendation to the chairman. May be repeated for a maximum of 10 hours. Students completing ten hours of studio problems will be required to exhibit their work in the department gallery. Prereq.: Permission of department chairman and completion of all previous courses in the chosen area. 1-10 q.h.

801. *Seminar.* Discussions on problems of the prospective teacher which involves plant facilities, tools, and supplies. Planning individual exhibits. Assembly of comprehensive portfolio. For students in art education only. (To be taken with student teaching.) Two hours lab. 1 q.h.

803. *Painting III.* Concentration of individual techniques. Ten hours lab. Prereq.: Art 703. 5-10 q.h.

806. *Indian Art.* Survey of the art of India from the Indus Valley to the Mogul Invasion; its relation to the philosophies and religions of the country; comparisons of the characteristics of the great periods. 3 q.h.

807. *Chinese/Japanese Art.* Survey of the art of China and Japan from the earliest periods to date, and their relation to the philosophies and religions of those countries. 3 q.h.

810, 811. *Advanced Ceramics I and II.* Continuation of Art 726. Six hours lab. Prereq.: Art 726. 3+3 q.h.

812. *Sculpture III.* Concentrated exploration of techniques developed in Art 730 or 731. Ten hours lab. Prereq.: Art 731. 5-10 q.h.

814. *Twentieth Century Art to 1925.* Survey of important movements in painting, sculpture, and architecture from 1885 to 1925. Study of the artists involved with these movements. 3 q.h.

815. *Twentieth Century Art from 1925.* Survey of important movements in painting, sculpture, and architecture from 1925 to date. Study of the artists involved with these movements. 3 q.h.

816. *Introduction to Museum Practices.* An exploration of museum history, administration, acquisitions, preservation, conservation, connoisseurship, exhibition procedures, physical plant, and security will be made. Weekly seminars and practical internship experience at the Butler Institute of American Art and the Arms Museum will be utilized. Two hours of seminar and six hours of museum practices per week. Prereq.: 12 hours of art history and junior standing. 5 q.h.

821. *Printmaking III.* Concentrated experiments with metal techniques. Ten hours lab. Prereq.: Art 611 or permission. 5-10 q.h.

822. *Puppetry and Stage Construction.* Concentrated exploration of puppetry, stage design and construction, and a survey of the historic development of puppetry. Six hours lab. Prereq.: Art 767. 3 q.h.

823. *Fabrics and Weaving.* Concentrated exploration of the techniques of weaving and dyeing with emphasis on the creative application of these techniques. A study of the historical development of the techniques of weaving and dyeing. Six hours lab. Prereq.: Art 767 or permission. 3 q.h.

880. *Photography 6.* Specially selected technical and aesthetic photographic problems to enrich the student's abilities and knowledge of photography. May be repeated for a maximum of 10 q.h. Student must provide camera and supplies. Eight hours lab. Prereq.: Eight hours of Photography and acceptance of written problem proposal by instructor. 5-10 q.h.

890. *Problems in Art History.* Studies in bibliography, descriptive and interpretative terminology, iconography, research methods and objectives, forms and structures of critical performances. Course may be repeated for maximum of nine quarter hours. Prereq.: Senior Standing and permission of instructor and chairman of Art Department. 1-9 q.h.

SPEECH COMMUNICATION AND THEATRE

Professors Elser and Hulsopple; Associate Professor O'Neill (chairman); Assistant Professors Castronovo, Robinson and Kougl; Instructors Shale and Owens.

The principal degrees for speech communication and theatre majors are the *Bachelor of Arts* and *Bachelor of Fine Arts.* Requirements for the Bachelor of Arts are described in the General Requirements and College of Arts and Sciences sections of this catalog.

BACHELOR OF ARTS

The Speech Communication majors emphasizing Speech Communication, Telecommunications, or Theatre require 60 credit hours within the department. The goal of the speech communication curriculum is to give the student a broad liberal arts knowledge of human communication in society. Students emphasizing Telecommunications receive an extensive practical orientation to the techniques, problems, and theories of broadcasting.

The Theatre emphasis includes extensive practical training in the techniques and problems of the theatre.

TEACHER CERTIFICATION

Those desiring certification in high school teaching may elect to complete either the *Bachelor of Arts* requirements, plus the education requirements, or the *Bachelor of Science in Education* with emphasis in speech communication. (The requirements for this degree are listed in the School of Education section of this catalog.)

THEATRE

All students at the University are invited to participate in the production of plays. The University theatre presents three or four major productions each academic year. Each production is under the supervision of the faculty of the Speech Communication and Theatre Department. Recent productions have included *The Miracle Worker, Medea, The Good Woman of Setzuan, The Glass Menagerie, Inherit the Wind, The Runner Stumbles,* and *Wonderful Town.*

The University Theatre also sponsors a series of Classic International Motion Pictures each year. In addition, they have inaugurated a program through which a special month-long salute is made to some foreign country's contribution to world culture. Salutes thus far have been made to France, Great Britain, Italy, and Spain. A special week-long program called Theatre YSU—the format of which varies from year to year—is sponsored each spring. Also, in conjunction with the spring production, a high school drama workshop is conducted for all of the high schools within the Youngstown area.

DEBATE AND OTHER FORENSIC ACTIVITIES

The forensic program at the University divides itself into three areas — intercollegiate

debate, intercollegiate individual events, and community presentation programs.

The debate team participates in numerous multi-school tournaments each season, including tournaments on both the national debate question and a variety of unique and short-term questions.

Youngstown is one of the few mid-American schools participating in parliamentary debate, regularly confronting both Ivy League and Canadian universities.

BACHELOR OF FINE ARTS

The *Bachelor of Fine Arts in theatre* is offered for students majoring in the performance and design areas of theatre (acting, directing, lighting, scene design). The requirements for this degree are listed below:

BACHELOR OF FINE ARTS CURRICULUM

See General Requirements at the beginning of the College of Fine and Performing Arts section.

THEATRE

560	Introduction to Theatre Arts	4 hrs.
561	Stagecraft	4 hrs.
623	Rehearsal and Performance	3 hrs.
624	Rehearsal and Performance	3 hrs.
661	Play Production	4 hrs.
662	Practicum in Technical Theatre	6 hrs.
668	Fundamentals of Acting	4 hrs.
670	Oral Interpretation	4 hrs.
761	Make Up for Stage and TV	3 hrs.
762	Play Direction	4 hrs.
763	Scene Design	3 hrs.
764	History of Stage Costuming	4 hrs.
765	Stage Lighting	3 hrs.
770	Advanced Oral Interpretation	4 hrs.
863	Advanced Acting	4 hrs.
864	Advanced Directing	4 hrs.
891	History of the Theatre I	4 hrs.
892	History of the Theatre II	4 hrs.
899	Seminar in Theatre (can be taken twice)	6 hrs.
	or	
862	Dramatic Writing Criticism and	4 hrs.
899	Seminar in Theatre	3 hrs.
	Fencing and Dance (This will include H&PE 514R, 515R, 540R, 541R)*	4 hrs.
	Electives in related fields	12 hrs.
	Total	**95 hrs.**

*Note: With departmental permission H&PE 545R, and 546R, may be substituted for 540R, and 541R.

Speech Communication
Lower Division Courses

525. *Speech Communication Skills.* Intensive work on fundamental speech communication problems. In consultation with the instructor, students will set individual goals and perform practical exercises designed to help them overcome these problems. Prereq.: Permission of the instructor. *Does not count toward a major in Speech Communication.* (Sp) 2 q.h.

550. *Principles of Speech Communication.* Designed to improve speech skills through the application of rhetorical and communication principles to varying audience situations. Speakers, audience, and message variables will be examined. Introduces the student to basic principles of International Communication. The student will be expected to relate these principles to the demands of speech communication situations. 4 q.h.

554. *Speech Communication Skills in the Classroom.* A speech fundamentals course adapted to the special needs of teachers. Emphasis on elements of voice quality and production, improving interpersonal communication skills in the classroom, development of group discussion techniques, and skill in the extemporaneous style of classroom presentation. 4 q.h.

603. *Physical Aspects of Speech.* A fundamental study of the voice mechanism, vocal sound, and elementary phonetics. Includes a functional familiarization with the International Phonetic Alphabet. 2 q.h.

604. *Articulation and Diction.* Training in the fundamental physical skills of speech: articulation, breath control, vocal variety, voice quality. Attention is focused upon the specific speech characteristics of the individual student. This course may be repeated once for credit for a total of four hours. Prereq.: 603 or permission of instructor. 2 q.h.

606. *Speech Correction.* A survey of the various types of speech disorders and of the various types of correctional methods that have been and are being employed. Laboratory hours will be arranged in order to ensure adequate practical experience. 4 q.h.

652. *Business and Professional Speaking.* A study of the principles of speaking in business, education, industrial, and professional situations. Primarily for students enrolled in Business Administration. 3 q.h.

653. *Principles of Discussion and Conference.* Principles and practice of small group

discussion. This course will teach the theory and techniques of small group interaction as the techniques of interviewing. (This is helpful as a second speech course for students enrolled in Business Administration.) Prereq.: 550 or 652. 3 q.h.

654. *Argumentation and Debate.* Principles and practices of formal argumentation including analysis of issues, evidence, reasoning and refutation. Prereq.: 550 or 652. 4 q.h.

655. *Parliamentary Procedure.* A study of the proper procedure in the conduct of business meetings, the formation of organizations, the writings of constitutions. 2 q.h.

658. *Advanced Public Speaking.* This course is designed to further develop speech-communication skills and amplify the principles considered in speech. Sophistication in speech preparation and persuasion strategies will be emphasized. Prereq.: 550 or 652. 4 q.h.

670. *Oral Interpretation.* A study of the fundamental problems involved in oral interpretation. Emphasis will be placed upon developing poise and ease before an audience, a clear and forceful voice, and flexibility and discrimination in converting thoughts from the printed page into oral communication. Selections will be prepared and presented in class. 4 q.h.

Upper Division Courses

705. *Speech Problems of Children.* A consideration of speech improvement for all pupils and of speech correction for pupils with speech and/or hearing problems on the kindergarten, primary, and intermediate levels. Types of difficulties, techniques, and materials for development and continued use of good voice and acceptable speech. Required of all elementary teachers. 3 q.h.

751. *Classical Rhetoric.* Survey of effective persuasion as taught in the ancient world from pre-Aristotelian Greece to the Rome of St. Augustine. Speech-making practices of present-day America are traced to their ancient sources. 4 q.h.

752. *British Public Address.* This course will explore the major speakers and movements in British Public Address. Speakers and speeches will be studied in relation to time of cultural, economic, and political upheaval as Great Britain won and lost an empire. Prereq.: 550 or 652. 4 q.h.

753. *Interpersonal Communication: Theory and Practice.* Principles of interpersonal communication in such areas as nonverbal communication, open versus defensive climates, and small group communication behavior. Does not embrace psycho- or socio-therapeutic practice. Prereq.: Speech 550 or 554 or 652. 4 q.h.

755. *Ethical Considerations of Speech Communication.* Problems and issues dealing with the propriety of public discourse. Explores and evaluates rationales for prior restraint of discourse based on moral, artistic, and practical considerations. Prereq.: 550, 554, 652, or permission of instructor. 4 q.h.

758. *Oral Communication Theory.* A survey of oral communication from the behavioral science literature. The communication process will be related to the Shannon and Weaver model of source, message, receiver, and channel. Prereq.; 550 or 652. 4 q.h.

770. *Advanced Oral Interpretation.* A study of the problems involved in presenting oral readings of some length and difficulty in fiction, poetry, and drama. When possible, opportunities will be given members of the class to present programs outside the classroom. Prereq.: 670. 4 q.h.

815. *Applied Public Speaking.* To be taken by members of the forensic team only after one quarter of work on the team and with permission of the debate coach. 3-5 q.h.

850. *Early American Public Address.* This course will explore speakers and rhetorical movements from Colonial times through the Reconstruction period. The course will concentrate on such orators as Jonathan Edwards, John Adams, Daniel Webster, Stephen Douglas, Andrew Johnson, and Thaddeus Stevens. Prereq.; 550 or 652. 4 q.h.

851. *Contemporary American Public Address.* This course will explore speakers and rhetorical movements from Reconstruction through the mid-twentieth century. The course will analyze the rhetorical efforts of such figures as Booker T. Washington, Henry Grady, Woodrow Wilson, Wm. J. Bryan, Franklin Roosevelt, and John Kennedy. Prereq.: 550 or 652. 4 q.h.

852. *Group Communication.* A descriptive study of communication variables in the small-group setting, together with a survey of literature dealing with small-group communication. Prereq.: 653 or 758 or permission of the instructor. 4 q.h.

854. *Theories of Persuasion.* Rhetorical and socio-psychological theories of persua-

sion. Prereq.: 658 or permission of instructor. 4 q.h.

855. *Speech Criticism.* Approaches to the critical evaluation of significant speeches, past and present. Rhetorical, literary, historical, linguistic, and quantitative methods of criticism will be analyzed. Prereq.: 550 or 554 or 652, plus 654 or 658 or 755, or permission of the instructor. 4 q.h.
NOTE: *When 855 is taken on the basis of a completed 654, 658, or 755 prerequisite, completion of 855 shall not preclude credit for either or both of the other prerequisites taken subsequently.*

858. *Practicum in Communication Research.* Experience in designing, validating and using methods and instruments appropriate for research into human communication. Prereq.: Speech 758. 4 q.h.

898. *Seminar in Speech Communication.* This course is designed to provide the student with opportunities to explore areas in speech communication not covered in regular course offerings. May be repeated for credit as long as any specific seminar subjects are not repeated. Typical seminar subjects might include Black Rhetoric, Political Campaign Speaking, or Organizing and Coaching Interscholastic Forensics. Prereq.: Senior standing in speech communication or permission of the instructor. 3-4 q.h.

Television and Radio
Lower Division Courses

580. *Principles and Practices of Broadcasting.* A survey course designed to familiarize students with the principles and practices involved in radio and television broadcasting. Required of majors. Prereq.: 550 or 652. 3 q.h.

581. *Survey of American Mass Communication.* A rhetorical examination of the development, operation and functions of radio, television, film and print media in America. Television documentaries and films will illustrate the implications of mass communication. The student will be expected to examine how a person may be individually affected by mass communication. Prereq.: None. May be taken for credit toward the Humanities Area Requirement. 4 q.h.

682. *Radio and Television Station Writing.* Fundamentals of broadcast writing, emphasis on the theory analysis, and practices in the preparation of station and program continuity, news, and documentaries. Prereq.: 580. 4 q.h.

683. *Principles of Broadcast Operations and Performance.* An introduction to practices and procedures basic to radio and TV production facilities. Examination of control room operations, studio procedures, control room — studio communication, legal constraints on broadcast production operation, and the announcer's functions in broadcast speech communication. Nominally will include three hours lecture plus two hours lab per week. Prereq.: Speech 580. 4 q.h.

Upper Division Courses

761. *Makeup for Stage and Television.* The history, purpose, and techniques of application of makeup. Laboratory participation working on productions for both stage and television. Prereq.: 561 and 661 or permission of the instructor. 3 q.h.

780. *Principles and Practices of Radio and Television Announcing.* A study of the announcer's role in radio and television stations. Students will examine theories, techniques and major styles of broadcast announcing. Three hours lecture, two or more hours of individualized lab per week. Prereq.: 683. 4 q.h.

781. *Radio Production.* Study of the concepts of radio production and programming. Production of various types of radio programs. Prereq.: 580 or permission of the instructor. 4 q.h.

782. *Television Production.* Study of the many elements of television production-equipment lighting, scene design, graphics, special effects, video tape, film, and creative camera work. Prereq.: 580 or permission of the instructor. 4 q.h.

783. *Broadcasting Regulations.* Responsibilities of broadcasters as prescribed by law and governmental policies and regulations and court decisions. Comparative study and analysis of purposes, methods, and techniques of foreign broadcasting operations. Prereq.: 580 or permission of the instructor. 4 q.h.

787. *Practicum in Telecommunications.* Individual study and practical application of radio and television performance and production skills in a broadcast environment. Repeatable for a maximum of eight (8) hours. Prereq.: 683 and acceptance of practicum proposal. 2-4 q.h.

897. *Seminar in Telecommunications.* This course is designed to provide the student with opportunities to investigate contemporary problems in radio and television. May be re-

peated for credit as long as specific seminar subjects are not repeated. Prereq.: Senior standing in telecommunications or permission of the instructor. 3-4 q.h.

Theatre
Lower Division Courses

560. *Introduction to Theatre.* A study of the theory, the history, the cultural role, and the physical characteristics of the theatre as an institution in human society. 4 q.h.

561. *Stagecraft.* A study and application of the technical elements of play production, with emphasis on stage mechanics, construction, and scene painting. Laboratory hours will be arranged in order to ensure adequate practical experience in the scenic arts and crafts. 4 q.h.

590. *History of the Motion Picture.* The history of the motion picture from its beginning to the present. This course will place emphasis upon the milestones of the film as a performing art. Screening of significant films from various periods and countries will be featured. 4 q.h.

623, 624. *Rehersal and Performance.* Detailed study of a play through preparing it for public performance. Credit given for roles played in University Theatre Productions. 1-3 1-3 q.h.

661. *Play Production.* An introduction to the process of analyzing, directing, staging, and producing plays; demonstration and practice. Laboratory hours by arrangement. Prereq.: It is recommended that, when possible, students elect Speech 561 before taking this course. 4 q.h.

662. *Practicum in Theatre.* Practical application of technical theatre skills in University theatre productions through classroom and laboratory participation. Repeatable for a maximum of six (6) hours. Prereq.: 561. 2 q.h.

668. *Fundamentals of Acting.* A study of the fundamental theories and techniques of acting. Major emphasis will be placed upon theatre acting, but consideration will be given to radio and television acting. Laboratory hours by arrangement. Prereq.: 661 or permission of the instructor. 4 q.h.

690. *Artistic Aspects of Motion Picture Production.* This course will provide an analysis of the structure of the motion picture, the development of the script, the function of editing, the approach to acting in film production, and the problems faced by a director in film production. Criteria of artistic film making will be studied. Examples from motion pictures will be screened and discussed. Prereq.: Speech 590 or English 616. 4 q.h.

Upper Division Courses

760. *Dramatics for Elementary Grades.* Major emphasis is placed on the theory and techniques of creative dramatics. Consideration is also given to the production of children's plays. Practical experience will be provided when possible through cooperation with our schools. Prereq.: Sophomore standing. 4 q.h.

761. *Makeup for Stage and Television.* The history, purpose, and techniques of application of makeup. Laboratory participation working on productions for both stage and television. Prereq.: 561 and 661 or permission of the instructor. 3 q.h.

762. *Play Direction.* An intensive study of the process of directing plays. Whenever possible students in the course will direct the equivalent of a one-act play for public presentation. Laboratory hours by arrangement. Prereq.: 661 or permission of the instructor. 4 q.h.

763. *Scene Design.* Includes the history of design in terms of stage scenery, an investigation of current trends, techniques, and media of scene design, and the practical execution of models and sketches by the student. Prereq.: 561 and 661 or consent of the instructor. 3 q.h.

764. *History of Stage Costuming.* A historical survey of costumes for the stage based upon styles of the Western world from the Ancient Egyptians (4000 B.C.) through contemporary times. Emphasis will be placed upon specific periods and differences in design. 4 q.h.

765. *Stage Lighting.* This course includes a study of historical development, basic electrical theory, switchboards and lighting instruments; color theory, principles and practices in stage lighting. Laboratory hours to be arranged. Prereq.: 561 and 661 or consent of the instructor. 3 q.h.

790. *Creative Motion Picture Artists.* An in-depth analysis of significant motion picture creative artists and their contributions to the history of motion picture art. Screenings and discussions of selected motion pictures will be included. Prereq.: Speech 590 or English 616. 4 q.h.

862. *Dramatic Writing and Criticism.* Includes a study of the history of dramatic criticism and outstanding critics as well as a study of the elements of dramatic structure and the writing of dramas. Prereq.: 661 or English 746 or permission of the instructor. 4 q.h.

863. *Advanced Acting.* A study of specific theories, techniques, and the various important styles of acting. Prereq.: 661 and 658. 4 q.h.

864. *Advanced Directing.* A study of specific theories, techniques, and various important styles in play directing. Prereq.: 661 and 762. 4 q.h.

891. *History of the Theatre I.* A history of the physical theatre and written drama from antiquity through the Renaissance. Emphasis on theatre architecture and stagecraft, including scenery, costumes and lighting. Prereq.: Upperclass standing with a minimum of 12 hours of theatre courses completed or consent of the instructor. 4 q.h.

892. *History of the Theatre II.* A history of the physical theatre and the written drama from the post-Renaissance period to the present. Emphasis on theatre architecture and stagecraft, including scenery, costumes and lighting. Prereq.: Upperclass standing with a minimum of 12 hours of theatre courses completed or consent of the instructor. 4 q.h.

899. *Seminar in Theatre.* This course is designed to provide the student with opportunities to explore areas in theatre not covered in the regular course offerings. May be repeated for credit as long as specific seminar subjects are not repeated. Specific course offerings under this course title may include: Advanced Scene Design, Advanced Stage Lighting, Theatre Styles, Theatre Organization and Management, and Modern Techniques and Procedures in the Contemporary American Theatre. Prereq.: Senior standing in theatre or permission of the instructor. 3 q.h.

The Dana School of Music

Donald W. Byo, Director

ORGANIZATION AND DEGREES

OBJECTIVES

The Dana School of Music began in 1869 as Dana's Musical Institute in Warren, Ohio. It was merged with Youngstown College in 1941.

The purpose of the School is to complement the general objectives of the University by providing intensive professional training in music based on a thorough understanding of the fundamental skills and theory upon which all music rests, and to provide an opportunity for the non-music major to develop a background of musical knowledge.

The requirements for entrance and for graduation as set forth in this catalog are in accordance with the published regulations of the National Association of Schools of Music, of which the Dana School of Music is a member.

The curriculums may be divided into four components: music education, theory, performance, and liberal arts. Courses leading to the degree of Bachelor of Music with the major in piano, organ, voice, standard string or wind instrument, percussion, theory, composition or music education are available. In addition, it is possible to obtain the degree Bachelor of Arts with majors in music history, theory and applied music.

In cooperation with the School of Education, the music education department prepares students for certification as music teachers in the public schools and other courses necessary for general elementary teaching certificates. Music education students have a variety of opportunities for observation and practice teaching possible through excellent cooperation between the University and all of the area schools.

Credit in music is allowed in varying amounts toward other degrees granted by the University.

FACILITIES

The School is one of three units in the performing arts, which is housed in Bliss Hall, where there are 67 accoustically controlled practice rooms, faculty studios, classrooms, rehearsal rooms and a recital hall with a seating capacity of 300. In addition, frequent use is made of the Dana Recital Hall, Stambaugh and Powers auditoriums.

EQUIPMENT

Equipment includes 32 Steinway pianos, 68 other pianos, harpsichords by Dowd and Speerhake, two Schlicker organs, three Flentrop organs, consorts of recorders and krum-

horns, a cornetto and a comprehensive collection of standard band and orchestral instruments.

Many University-owned instruments are available for use by students who are enrolled in a related course. Failure to comply with check-in deadlines of these instruments will result in a $5.00 per day fine for each instrument.

LIBRARIES

The library of band, orchestral and choral music is extensive, and is representative of musical periods from the Renaissance to the present. The large music section of the Maag Library contains books and music for study by students in music literature, music education, and theory classes. An extensive collection of records and scores is located in the Materials Center of Bliss Hall, where listening equipment is available for general use.

SCHOLARSHIPS AND LOANS

The Dana School of Music has at its disposal a number of scholarships, which are awarded, after competitive auditions, on the basis of talent, intelligence, and need. Applications should be directed to the director of the Dana School of Music. For other scholarships, see *Loans and Scholarships* in the General Information section.

PLACEMENT SERVICE

Through its many alumni, the School can give its graduates considerable assistance in finding professional positions. Its contacts extend through 42 states, and each year requests for graduates are received from all branches of the profession. Full services of the University Placement Office are available to music students. For further information, see *Career Planning and Placement* in the General Information section.

MUSICAL ACTIVITIES

The Dana School of Music supplements the concerts of the Monday Musical Club and the Youngstown Symphony Orchestra with the *Dana Concert Series*. This series brings to the University and to the public artistic solo and ensemble programs featuring faculty members and guest artists, composers, and musicologists.

Graduation recitals and informal student recitals afford additional training through experience in public performance. Music majors are required to attend 24 recitals in their first year. Additional course work in the major field will be required if attendance is impossible.

There are several major performing ensembles including: the Concert Choir, the University Chorus, the Wind Ensemble, the Concert Band, the Marching Band and the Dana Symphony Orchestra.

In addition, chamber ensemble experiences are possible through the Opera Workshop; the Madrigal Singers; the Men's Chorus; the Jazz Ensemble; Woodwind, Brass and Percussion ensembles; the Chamber Orchestra; and the String Ensemble.

PROFESSIONAL FRATERNITIES

Alpha Nu chapter of Sigma Alpha Iota, international professional music fraternity for women, and Delta Eta chapter of Phi Mu Alpha Sinfonia fraternity of America, are chartered to the Dana School of Music.

OTHER STUDENT ACTIVITIES

Students of the Dana School of Music may take part in Youngstown State University activities as described under *Student Activities*, in the General Information section. In addition the School sponsors student chapters of the Music Educators National Association and the Youngstown chapter of Composers, Authors and Artists of America. The School and the Youngstown chapter of the American Guild of Organists jointly sponsor a Guild Student Group.

THE ALUMNI ASSOCIATION

The Dana School of Music has a large and active Alumni Association formed many years ago during the School's independent existence, which operates within the framework of the Youngstown State University Alumni Association. The organization is the means of a continuing relationship between the School and its graduates, and its services are continually increasing. See also Alumni Association in the General Information section.

FEES

See *Fees and Expenses* in the General Requirements and Regulations sections.

APPLICATION AND ADMISSION EXAMINATIONS

An applicant for admission to the Dana School of Music must satisfy the general requirements for admission to the University (see the General Requirements and Regulations section).

Applicants are required to pass entrance auditions in their performance area and to take a placement examination in music theory. These auditions and examinations are scheduled on announced dates preceding the fall entrance date.

ADMISSION TO COURSES FOR THE DEGREE OF BACHELOR OF MUSIC

The applicant's high school courses should include the preparatory courses specified under *Requirements for Degrees.*

Musical Proficiency

It is expected that the applicant will have developed a certain proficiency in one or more branches of applied music before entering the University, as certain standards in technique and repertory must be met. Qualifications are determined by the placement tests mentioned above; and the student not qualifying for the first regular course in that major branch of applied music takes preparatory work until ready to undertake the regular courses.

The Dana School of Music theory entrance examination is used to determine theory proficiency. Those scoring less than the 50th percentile will be assigned to Music 520, while those scoring above the 50th percentile may enter the honors theory sequence. Students participating in the honors theory sequence will take Music 510H, 511H, 512H and 610H. After completing Music 610H a comprehensive examination will be given to determine whether degree requirements for Music 611 and 612 will be waived.

The student wishing to major in composition should present evidence of ability to handle the materials of music by placing at or above the seventieth (70th) percentile on both parts of the Dana School of Music Theory Entrance Examination; and the student should demonstrate, by jury examination of the appropriate applied faculty, proficiency on a musical instrument sufficient for admission to the freshman level of applied music in the Music Education Curriculum (Music 504).

ADMISSION FROM OTHER INSTITUTIONS

The general policy is stated in the General Requirements and Regulations section. Advanced standing in performance and in music theory is granted tentatively and must be validated by examinations.

REQUIREMENTS FOR THE DEGREE

Bachelor of Music

It is the student's responsibility to see that all the graduation requirements for the degree sought are satisfied. For the Bachelor of Music degree, these consist of:

1. Pre-college or preparatory study, of two kinds:

a. Academic. The specific courses are listed in the General Requirements section under the College of Fine and Performing Arts. These courses are normally taken in high school. Those lacking must be made up before the junior year in the University.

b. Musical. An entrant lacking suitable proficiency must develop it after entrance before undertaking the required college-level music courses.

2. The courses and other requirements to be completed in the University are listed in the General Requirements section.

a. Curriculums. Curriculums leading to this degree require from 189 to 209 quarter hours of credit and are designed to be completed in four academic years.

b. R.O.T.C. R.O.T.C. students are allowed certain modifications of the requirements as explained in the General Requirements and Regulations section.

FOR TWO MAJORS, IN MUSIC AND IN MUSIC EDUCATION

Students who wish to complete a major (Bachelor of Music degree) in an instrument or in voice, theory, or composition, and also a major in music education, should consult the Director of the Dana School of Music.

COURSES OF INSTRUCTION AND CURRICULUMS†

FACULTY

Professors Byo, Gould, R. E. Hopkins, Raridon, Sample, Vogel, and Walker; Associate Professor Alleman, Fleming, L. M. Hopkins, Kagarice, Lapinski, Largent, Orr, Pellegrini, Slocum, Spiro and Starkey; Assistant Professors Funk, Gelfand, Harris, Mayhall, Mould, Parlink, Rollin, Rosenberg, Rudnytsky, and Turk; Instructor Sarvello

PERFORMANCE

Acceptance into a performance area is contingent upon an audition. The student not qualifying for Music 504 may take the relevant course 500 until his deficiency is overcome.

This non-degree course is not available in all applied programs.

Advanced standing in performance may be granted tentatively after an examination given by members of the faculty. The final classification is made at the end of the first quarter of resident study. The student who can meet the performance requirements without taking the designated courses may earn in other music courses as many quarter hours as in the courses not taken.

As far as teaching staff and practice rooms are available, enrollments in applied music will be accepted in the following order:

1. Full-time music majors
2. Other students in the University
3. Private students

TEACHER ASSIGNMENT. Assignments of students to teachers are made by the Area Coordinator. Requests for change of teacher should be addressed to the Coordinator. A student's choice of teacher will be respected as far as possible, but final assignment rests with the director of the School of Music.

LESSONS. Students registered for 6 q.h. courses receive 75 minutes of individual instruction and one 50-minute seminar weekly; they are required to practice three-hours daily. Students registered for 4 q.h. courses receive 50 minutes of individual instruction and one 50-minute seminar weekly; they are required to practice two-hours daily. Students registered for 2 q.h. courses receive 25 minutes of individual instruction and are required to practice one-hour daily.

No credit will be given in a performance course if the student misses more than three lessons in any one quarter. In case of prolonged illness the lessons may be made up at the discretion of the teacher.

RECITALS. Students registered for 4-q.h. or 6-q.h. courses are required to attend performance classes arranged by the Area Coordinator and to perform in them once each quarter after the freshman year. The performance requirement may be waived during the quarters in which the student is presenting the junior or senior recital. Instructors may require students to attend and perform in studio recitals (participants drawn from the instructor's private class).

General Student Recital. The director of the Dana Concert Series arranges evening programs with participants from the entire student body.

Concerto/Aria Concert. An annual concert features students chosen by competition to appear as soloists with the Dana Symphony Orchestra.

Junior Recital. Students majoring in performance are required to present a half-hour recital in the junior year.

Senior Recital. Students graduating with a major in performance are required to present a one-hour recital in the senior year. Students graduating with a concentration in performance are required to present a half-hour recital in the senior year.

EXAMINATIONS. Students are examined at the end of each quarter of study during the freshman year. Sophomores, juniors, and seniors may elect to be examined at the end of either the fall or winter quarter, but must be examined at the end of the spring quarter. Transfer students must be examined at the end of their first quarter of study. Students presenting recitals must perform their entire program for faculty approval 15-30 days prior to the date on which recital is scheduled. Students presenting recitals are granted a waiver of examination for the quarter of the recital. Grades are given by the student's individual instructor in the quarters in which the student is not examined by jury. Students may be retained in the same proficiency level with a grade of *C* or lower. Students who fail to meet the standards of the examining faculty may be required to reduce the number of credit hours for which they register in subsequent quarters; or they may be required to withdraw completely from the course sequence.

Change in Credit Hours. Students may transfer from minor to concentration or major courses according to the Performance Course Equivalency Table, subject to approval by the appropriate performance faculty.

KEYBOARD INSTRUMENTS

Entrance Requirements. Applicants for degrees with major or concentration in piano, harpsichord, or organ must pass an entrance audition (preferably from memory) similar in format and difficulty to the following: Bach, *Inventions*, Beethoven, *Sonata*, Op. 49, No. 2; Chopin, less difficult *Preludes*. In addition, they should be able to demonstrate fluency in major and minor scales and in keyboard musicianship skills. Applicants for degrees with major or concentration in harpsichord may, in addition to the piano audition, choose to perform on the harpsichord a composition

of the difficulty of Bach's *Inventions*. Applicants for degrees with major or concentration in organ may, in addition to the piano audition, choose to perform on the organ a composition of the difficulty of the eight *Little Preludes and Fugues* attributed to Bach. Students who fail to pass the entrance audition may be allowed to register for piano 500 for up to three quarters at two non-degree q.h. each. All performance course assignments are tentative until the first examination.

Piano
Major Courses

504, 505, 506. Development of hand position and finger-stroke; emphasis on finger independence. All major and minor scales and tonic, dominant-seventh, and leading-tone seventh arpeggios, hands together, four-octave compass. Repertoire of the variety and difficulty of the following: Bach, *Sinfonias;* Beethoven, *Sonata,* Op. 14, No. 1; Chopin, *Nocturne,* Op. 55, No. 1; Bartok, *Three Rondos,*. Prereq.: entrance audition. 4+4+4 q.h.

607, 608, 609. Continuation of previous technical study; emphasis on development of hand-stroke. Scales in octaves, thirds, sixths, and tenths; arpeggios as above, faster tempo. Repertoire of the variety and difficulty of the following: Bach, *English Suites;* Scarlatti, *Sonatas;* Beethoven, *Sonata,* Op. 26; Chopin, less difficult *Etudes* and *Polonaises;* Debussy, *Preludes;* Hindemith, *Sonata II.* Prereq.: Music 506. 6+6+6 q.h.

707, 708, 709. Technical studies to develop forearm-stroke and refine hand-stroke. Scales in double-thirds and double-octaves. Repertoire of the variety and difficulty of the following: Bach, *Well-Tempered Clavier;* Beethoven, *Sonata,* Op. 28; Chopin, *Scherzos;* Ravel, *Valses nobles et sentimentales;* Prokofiev, *Visions fugitives;* Mozart, Haydn, or early Beethoven concertos. Half-hour recital. Prereq.: Music 609. 6+6+6 q.h.

807, 808, 809. Continuation of technical studies as needed. Repertoire of the variety and difficulty of the following: Bach, *Toccatas;* Beethoven, *Sonata,* Op. 31, No. 3; Chopin, *Ballades;* Copland, *Piano Variations.* Concertos by Mendelssohn, Chopin, Schumann. One-hour recital. Prereq.: Music 709. 6+6+6 q.h.

Concentration Courses

604, 605, 606. See Piano 607, 608. Prereq.: Piano 506. 4+4+4 q.h.

704, 705, 706. See Piano 609, 707. Prereq.: Piano 606. 4+4+4 q.h.

804, 805, 806. See Piano 708, 709. Prereq.: Piano 706. 4+4+4 q.h.

Minor Courses

501, 502, 503. See Piano 504, 505. Prereq.: Entrance audition. 2+2+2 q.h.

601, 602, 603. See Piano 505, 506. Prereq.: Piano 503. 2+2+2 q.h.

701, 702, 703. See Piano 607. Prereq.: Piano 603. 2+2+2 q.h.

801, 802, 803. See Piano 608. Prereq.: Piano 703. 2+2+2 q.h.

Non-degree Course

500. Remedial study for applicants who do not qualify for Piano 504, Organ 504, or Harpsichord 504. May be repeated twice. 2 non-degree q.h.

Harpsichord
Major Courses

504, 505, 506. Instruction in basic technique, with discussion of construction and maintenance. Survey of literature, ornamentation, and performance practices. Repertoire of the variety and difficulty of the following: Purcell, *Suites;* Bach, *Inventions;* Daquin, *Pieces de Clavecin.* Prereq.: Entrance audition. 4+4+4 q.h.

607, 608, 609. Continuation of technical studies emphasizing fingering and ornamentation. Introduction to improvisation and accompaniment from figured bass. Repertoire of the variety and difficulty of the following: Byrd, *Sellinger's Round;* Frescobaldi, *Partite sopra L'Aria di Follia;* Bach, *French Suites* and *Sinfonias;* Scarlatti, less difficult *Sonatas.* Prereq.: Music 506. 6+6+6 q.h.

707, 708, 709. Technical studies as needed. Continuation of improvisation and figured-bass studies. Repertoire of the variety and difficulty of the following: Gibbons, *Pavan and Galliard Lord of Salisbury;* Couperin, *Les Folies francaises;* Bach, *Well-Tempered Clavier, English Suites,* and concertos; Scarlatti, *Sonatas;* Pinkham, *Partita.* Half-hour recital. Prereq.: Music 609. 6+6+6 q.h.

807, 808, 809. Figured-bass accompaniment of works such as Handel, *Violin Sonatas.* Repertoire of the variety and difficulty of the following: Bull, *Walsingham;* d'Anglebert, *Variations sur les Folies d'Espagne;* Rameau, *Les Niais de Sologne;* Bach, *Toccatas;* Soler, *Sonatas;* Rochberg, *Nach Bach;* Pulenc,

Concert champetre. One-hour recital. Prereq.: Music 709. 6+6+6 q.h.

Concentration Courses

604, 605, 606. See Harpsichord 607, 608. Prereq.: Harpsichord 506. 4+4+4 q.h.

704, 705, 706. See Harpsichord 609, 707. Prereq.: Harpsichord 606. 4+4+4 q.h.

804, 805, 806. See Harpsichord 708, 709. Prereq.: Harpsichord 706. 4+4+4 q.h.

Minor Courses

501, 502, 503. See Harpsichord 504, 505. Prereq.: Entrance audition. 2+2+2 q.h.

601, 602, 603. See Harpsichord 505, 506. Prereq.: Harpsichord 503. 2+2+2 q.h.

701, 702, 703. See Harpsichord 607. Prereq.: Harpsichord 603. 2+2+2 q.h.

801, 802, 803. See Harpsichord 608. Prereq.: Harpsichord 703. 2+2+2 q.h.

Organ
Major Courses

504, 505, 506. Manual exercises; pedal exercises; easy trios. Repertoire of the variety and difficulty of the following: Pachelbel, *Fugues on the Magnificat;* Bach, *Prelude and Fugue in E Minor* (S. 533). *Es ist das Heil* (S. 638); Schumann, *Canon in B Major,* Op. 56, No. 6; Walcha, *Herzliebster Jesu.* Prereq.: Entrance audition. 4+4+4 q.h.

607, 608, 609. Pedal exercises, pedal scales. Repertoire of the variety and difficulty of the following: Couperin, *Messe a l'Usage ordinaire des Paroisses;* Bach, *Sonata in E-flat Major* (S. 525). *In dir ist Freude* (S. 615); Brahms, *Mein Jesu der du mich;* Hindemith, *Sonata II.* Prereq.: Music 506. 6+6+6 q.h.

707, 708, 709. Pedal scales and arpeggios; advanced studies. Repertoire of the variety and difficulty of the following: Buxtehude, *Prelude, Fugue, and Chaconne;* Bach, *Prelude and Fugue in B Minor* (S. 544), *Schmucke dich, O liebe Seele* (S. 654); Mendelssohn, *Sonata No. 6;* Alain, *Litanies;* Handel, concertos. Half-hour recital. Prereq.: Music 609. 6+6+6 q.h.

807, 808, 809. Technical studies as needed. Repertoire of the variety and difficulty of the following: Bach, *Fantasy and Fugue in G Minor* (S. 542). *Christ, unser Herr* (S. 684); Mozart, *Fantasy* (K. 594); Franck, *Chorale in A Minor;* Messiaen, *Transports de Joie,* Poulenc, *Concerto.* One-hour recital. Prereq.: Music 709. 6+6+6 q.h.

Concentration Courses

604, 605, 606. See Organ 607, 608. Prereq.: Organ 506. 4+4+4 q.h.

704, 705, 706. See Organ 609, 707. Prereq.: Organ 606. 4+4+4 q.h.

804, 805, 806. See Organ 708, 709. Prereq.: Organ 706. 4+4+4 q.h.

Minor Courses

501, 502, 503. See Organ 504, 505. Prereq.: Entrance audition. 2+2+2 q.h.

601, 602, 603. See Organ 505, 506. Prereq.: Organ 503. 2+2+2 q.h.

701, 702, 703. See Organ 607. Prereq.: Organ 603. 2+2+2 q.h.

801, 802, 803. See Organ 608. Prereq.: Organ 703. 2+2+2 q.h.

Voice
Major Courses

504, 505, 506. Concentration on the development of basic technique for the singer; breath control, freedom and relaxation of the vocal mechanism, maximum resonance and accurate articulation. At the teacher's discretion, the student will apply the technique acquired in selected works of the vocal repertoire. Foreign-language songs may be introduced. Amount of repertoire to be decided on an individual basis. 4+4+4 q.h.

607, 608, 609. Primary emphasis continues to be placed upon the development of the voice and the mastery of technique. The student will be expected to have attained sufficient mastery by the end of this year to properly sing a number of songs in English and in foreign languages. One or two arias from opera and oratorio will be included. Minimum requirements established by the voice faculty; requirements beyond these established by the teacher on an individual basis. 6+6+6 q.h.

707, 708, 709. Technical study continued with a view to maintaining steady growth in technical mastery. The repertoire will be enlarged to include a wide range of styles and periods. Songs appropriate to the individual voice will be chosen in English, French, Italian, and German. Operatic arias will be required. A public recital is required. 6+6+6 q.h.

807, 808, 809. Advanced literature and technique. Additional songs of the standard repertoire by French, German, Italian, Russian, English, and American composers. The student will demonstrate ability to sing in

three foreign languages, and will have a repertoire of operatic arias, oratorio arias, classic and modern songs for immediate use, and a knowledge of the general song literature. Each senior will be required to prepare a public recital and give a creditable performance of a program of songs and arias chosen from this and previous courses. 6+6+6 q.h.

The following courses differ only in degree from those listed above. Minimum attainment at the end of four years will be those goals set for the third year above. Senior recitals will be required.

Concentration Courses

604, 605, 606. See Voice 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Voice 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Voice 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Concentration on producing a pleasing and musical vocal tone. In addition to exercises chosen on the basis of their needs, students will be expected to learn a limited number of songs. Amount of repertoire decided by the voice faculty. Open to students with no previous training. 2+2+2 q.h.

601, 602, 603. Continued study of vocal technique, and literature suited to the individual voice. Songs and arias in foreign languages at the discretion of the instructor. Prereq.: Voice 501, 502, 503. 2+2+2 q.h.

701, 702, 703. Advanced vocal technique and literature. For those who can qualify. Prereq.: Voice 601, 602, 603. 2+2+2 q.h.

801, 802, 803. Advanced vocal technique and literature. For those who can qualify. Prereq.: Voice 701, 702, 703. 2+2+2 q.h.

String Instruments

String and guitar majors are expected to participate in departmental and general recitals. The master class is a co-equal part of the individual instruction, serving as a combination of laboratory and seminar in the preparation of solo, ensemble and orchestra repertoire. Basic texts are: *Six Lessons with Menuhin*, Menuhin; *Principles of Relaxation and Power*, Rosenberg; and *Principles of Playing and Teaching*, Galamian, or other materials as recommended by the string faculty for specific instruments. An optimum combination of individual and laboratory instruction is desired.

Violin

Major Courses

504, 505, 506. Kreutzer, *Studies*, to No. 32. Concertos by Vivaldi, Nardini, Rode, deBeriot. Sonatas by Corelli, Veracini, Leclair. Technical material including Sevcik, Op. 8 and 9, Flesch Scale System. Not fewer than six short compositions suitable for recital repertoire. Major and minor scales and arpeggios within one position, two octaves using a low position (I, II), a middle position (III, IV) and a high position (VI, VII). 4+4+4 q.h.

607, 608, 609. Kreutzer concluded; Fiorillo, Rovelli. Concertos by Bach, Viotti, Kreutzer, deBeriot. Sonatas by Tartini, Mozart, Handel. Not fewer than six compositions added to repertoire. Scales and arpeggios in three octaves continued with secondary strokes. Technical materials of 507, 508, 509 continued. 6+6+6 q.h.

707, 708, 709. Rode, *Studies*. Concertos by Mozart, Bruch, Vieuxtemps. Sonatas by Beethoven, Bach. No fewer than six compositions added to repertoire. Scales on one string, 1 octave, 2 octaves; arpeggios on one string, 1 octave 2 octaves. Scales in sixths, octaves, thirds, and tenths. Half hour recital. 6+6+6 q.h.

807, 808, 809. Advanced studies from Wieniawski; Dont, Op. 35; Gavinies and Paganini concertos. Wieniawski, Saint-Saens, Mendelssohn, Lalo, Beethoven, etc. Senior recital. 6+6+6 q.h.

Concentration Courses

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

604, 605, 606. See Violin 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Violin 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Violin 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Fundamentals in correct posture and positions of the left hand and of the bow arm. Yost's *Violin Method* supplemented by Riegger's *Exercises*. Studies by Wohlfahrt and Rode and easy first-position pieces. Scales and arpeggios in keys of not more than four accidentals. 2+2+2 q.h.

601, 602, 603. Beginning of position studies Maia Bang, Book III. Hans Sitt, Op. 32, Books II and III. Kayser Op. 20, pieces in first three positions. 2+2+2 q.h.

701, 702, 703. Position studies continued. Maia Bang, Book IV Schubert sonatinas. Mazas, *Special Studies.* Accolay and Hollander concertos. Easy double stops and scales. Scales and arpeggios in five positions. Not fewer than six new recital pieces. 2+2+2 q.h.

801, 802, 803. Continued study of positions. Maia Bang, Book V. Studies of Mazas and Dont: beginning of Kreutzer. *Allegro Brillante* by Tenhave, concerto by Hollander, sonatas by Handel. Scales in three octaves. 2+2+2 q.h.

Non-Degree Course

500. Remedial study for applicants who do not qualify for Violin 504. May be repeated twice. 2 non-degree q.h.

Viola Major Courses

504, 505, 506. Studies by Mazas, Kreutzer, Sitt, Schradick technic. Sonatas by Handel; repertoire material: not fewer than six pieces. Scales and arpeggios in three octaves. 4+4+4 q.h.

607, 608, 609. Studies by Kreutzer and Fiorillo. Sonatas by Vivaldi and Marcello. Scales and Arpeggios continued. Six recital pieces. 6+6+6 q.h.

707, 708, 709. Studies by Rode, Campagnoli, and Bruni. Concertos by Stamitz and Mozart. Scales in double stops. Six recital pieces. Half hour recital. 6+6+6 q.h.

807, 808, 809. Studies by Gavinies and Dolesji; sonatas by Bowen, Bach, and others. Scales and arpeggios continued. Senior recital. 6+6+6 q.h.

Concentration Courses

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

604, 605, 606. See Viola 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Viola 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Viola 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Fundamentals of left and right hand technics. Reading facility in alto clef is developed. Studies by Hofmann. Scales in the first position. Easy pieces. 2+2+2 q.h.

601, 602, 603. Development of left hand facility. Beginning of lower positions. Studies by Kayser. Scales in positions. Pieces in positions. 2+2+2 q.h.

701, 702, 703. First five positions. Studies by Mazas and Dont. Schubert sonatina. Seventeenth- and eighteenth-century sonatas. Six recital pieces. Scales in three octaves. Easy double stops. 2+2+2 q.h.

801, 802, 803. Higher positions. Mazas, Kreutzer. Pieces by Nardini, Sitt, and others. Scales in three octaves. 2+2+2 q.h.

Non-Degree Course

500. Remedial study for applicants who do not qualify for Viola 504. May be repeated twice. 2 non-degree q.h.

Cello
Major Courses

504, 505, 506. Studies from Dotzauer, Op. 35, and Duport. Scales and arpeggios in three octaves. Solos such as Bach, *Suite No. 1,* and Goltermann, *Concerto No. 4.* 4+4+4 q.h.

607, 608, 609. Scales and arpeggios in four octaves. Franchomme studies. Repertoire to include Romberg. *Concerto No. 2;* Bach, *Suite No. 2* or *No. 3;* and Beethoven, *Sonata, Op. 69, in A Major.* 6+6+6 q.h.

707, 708, 709. Scales in octaves, thirds, sixths. Popper, *Studies.* Concert pieces to include Breval, *Sonata in G Major,* or Eccles, *Sonata in G Minor,* and concertos by Boccherini and Lalo. 6+6+6 q.h.

807, 808, 809. Scales in octaves, thirds, sixths, and tenths. Piatti, *Caprices,* and Servais, *Caprices,*. Repertoire such as Reger, *Solo Suite No. 2,* and Haydn or Dvorak concerto. Senior recital. 6+6+6 q.h.

Concentration Courses

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

604, 605, 606. See Cello 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Cello 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Cello 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Kummer, *Method,* and Schroeder, *Studies.* Scales and solos in first position. 2+2+2 q.h.

601, 602, 603. Schroeder, *Studies.* Scales. Klengel, *Concertino in C Major;* Marcello. *Sonata in F Major.* 2+2+2 q.h.

701, 702, 703. Schroeder, *Studies.* Scales. Loeillet, *Sonata in G Major;* Goltermann, *Concerto No. 4.* 2+2+2 q.h.

801, 802, 803. Continued on a more advanced level. For those who qualify. 2+2+2 q.h.

Non-Degree Course

500. Remedial study for applicants who do not qualify for Cello 504. May be repeated twice. 2 non-degree q.h.

String Bass
Major Courses

504, 505, 506. Simandl, *30 Etudes.* Major and minor scales in two octaves. Solos such as Anderson, *Sonatina,* and Chapini, *Fantaisie Concertante.* Bach, *Minuet and Gavotte;* Vivaldi, *Intermezzo.* 4+4+4 q.h.

607, 608, 609. Hrabe, *Studies.* Repertoire, such as Cappuzzi *Concerto;* sonatas by Galliard and Loeillet; Ratez, *Six Characteristic Pieces,* Op. 46. 6+6+6 q.h.

707, 708, 709. Billie. *Method,* Part II, Books 4 and 5. Concert Pieces to include sonatas by Eccles, Antoniotti, and D'Andrieu. Half hour recital. 6+6+6 q.h.

807, 808, 809. Kreutzer, *Studies.* Reynolds, *Orchestra Studies;* Strauss, *Orchestra Studies.* Solos to include Koussevitzky concerto or Dragonetti concerto. Senior recital. 6+6+6 q.h.

Concentration Courses

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

604, 605, 606. See String Bass 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See String Bass 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See String Bass 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Simandl, *Method,* Part I Scales. 2+2+2 q.h.

601, 602, 603. Simandl, *Method,* Part II. Bach, *Minuet and Gavotte;* Vivaldi, *Intermezzo.* 2+2+2 q.h.

701, 702, 703. Simandl, *30 Etudes.* Anderson, *Sonatina.* 2+2+2 q.h.

801, 802, 803. For those who can qualify. 2+2+2 q.h.

Non-Degree Course

500. Remedial study for applicants who do not qualify for String Bass 504. May be repeated twice. 2 non-degree q.h.

Guitar
Major Courses

504, 505, 506. Scale patterns through all strings up to and including the ninth position. One study from numbers 1-5 by Segovia; 20 Studies for the Guitar by F. Sor; plus a similar study by Giuliani, Carelli, or Carcassi. Preludes 1, 3, and 4, H. Villa-Lobos; Etudes by Carcassi and Giuliani; music from Twelve Compositions, F. Tarrega; studies by Aquado, Villa-Lobos, Coste, and Almeida; simple ensembles from the works of Handel, Corelli, Scarlatti, and others of the same period; F. Sor Studies 1-10. 4+4+4 q.h.

607, 608, 609. Bach preludes; F. Sor studies 11-15; the music of English composers such as Dowland; *Prelude number 5,* H. Villa-Lobos; solo works by Granados (Spanish Dances); chamber music of Paganini, Boccherini, and Giuliani. 6+6+6 q.h.

707, 708, 709. Lute Suites, J. S. Bach; solo works of Ponce, Scarlatti, Granados, Albeniz, B. Henze, Sor, Tarrega, Ravel, etc.; Sor studies 16-20; *Concerto in A Major,* M. Giuliani; *Grosse Sonata* and other works by Paganini; ensembles from the works of Paganini; L. DeCall, Matiegka, and J. Kreutzer. Half hour recital. 6+6+6 q.h.

807, 808, 809. The J. S. Bach suites and fugues for lute; the Castelnuevo-Tedesco *Concerto;* solo works by B. Britten, deFalla, L. Almeida, Albeniz, etc.; *Prelude Number 2* and *Etudes* by H. Villa-Lobos; ensembles from the works of Ibert, Paganini, Boccherini, Haydn, and Schubert. Senior recital required. 6+6+6 q.h.

Concentration Courses

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

604, 605, 606. See Guitar 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Guitar 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Guitar 807, 808, 809. 4+4+4 q.h.

Minor courses

501, 502, 503. Technical studies: Scale Pattern Studies—Shearer, through D# harmonic minor; slur, ornament and reach exercise—Shearer; 120 Arpeggios for the right hand—Giuliani; Volume I—Shearer; All ditonic scales—Segovia. Sample repertoire: (6) Aquado Studies; 20 Etudes for Guitar, F. Sor; Etudes by Carcassi; Supplemental variations—Soleares; Malaguena and Bolero Rhythms—Kalal. 2+2+2 q.h.

601, 602, 603. Studies and solos of the level indicated for Guitar 507, 508. 2+2+2 q.h.

701, 702, 703. Studies and solos of the level indicated for Guitar 509, 607. 2+2+2 q.h.

801, 802, 803. Studies and solos of the level indicated for Guitar 608, 609. 2+2+2 q.h.

Woodwind Instruments

Flute

Major Courses

504, 505, 506. Studies compatible with the student's training and the development of technic, articulation, phrasing and tone quality. Repertoire to include all Handel *Sonatas*, at least 6 additional sonatas from the Baroque and the 24 Andersen Studies, Op. 33. 4+4+4 q.h.

607, 608, 609. Continued development of technic, articulation, phrasing and tone quality. Repertoire to include Bach *Sonatas in E minor*, and *B minor;* Mozart *Concerto in G major;* Louis Ganne *Andante and Scherzo;* Faure *Fantasy*, and the Telemann *Suite in A minor;* also the 24 Andersen *Etudes, Op. 15.* 6+6+6 q.h.

707, 708, 709. The study of solo works such as the Bach *Suite in B minor*, Schubert *Variations*, Op. 160; and *Sonatas* by Poulenc and Piston. Also at least 12 studies from Anderson, Op. 63, and 12 additional studies of comparable difficulty. The presentation of a 30-minute public recital of solo literature. 6+6+6 q.h.

807, 808, 809. Survey of etudes from the teaching standpoint. These are to include Hugues *Op. 101*, 32, and 75; *30 Caprices* by Karg-Elart, etudes by Boehm, Casterede, Schade, Briccialdi, Soussmann, Furstenau, and others. Solo repertoire to include the *Sonata Op. 94* by Prokofieff, and the Dutilleux *Sonatine*. The presentation of a 60-minute public recital. 6+6+6 q.h.

Concentration Courses

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon and a recital is required.

604, 605, 606. See Flute 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Flute 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Flute 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Moyse, *40 Little Pieces for the Beginning Flutist;* Platonov, *30 Studies;* Handel sonatas. 2+2+2 q.h.

601, 602, 603. Studies and solos of the level indicated for Flute 504 and 505. 2+2+2 q.h.

701, 702, 703. Studies and solos of the level indicated for Flute 506 and 604. 2+2+2 q.h.

801, 802, 803. Studies and solos of the level indicated for Flute 605 and 606. 2+2+2 q.h.

Non-Degree Course

500. Remedial study for applicants who do not qualify for Flute 504. May be repeated twice. 2 non-degree q.h.

Clarinet

Major Courses

504, 505, 506. Studies compatible with student's training and the development of technic, articulation, phrasing and tone quality. Repertoire to include Mozart, *Concerto K. 622;* Molter, *Concerto No. 3;* Von Weber, *Concertino*, and *Concerti No. 1 and No. 2;* and Saint Saens, *Sonata.* 4+4+4 q.h.

607, 608, 609. Continued development of technic, articulation, phrasing and tone quality. Repertoire expanded to include Hindemith, *Sonata;* Von Weber, *Variations* and *Grand Duo;* and Paris Conservatory Solos. 6+6+6 q.h.

707, 708, 709. Emphasis on the instrument in a chamber role and the study of solo works such as Brahms, *Sonatas, Op. 120 Nos. 1 and 2;* Bernstein *Sonata;* Debussy, *Premier Rhapsody.* The presentation of a 30-minute public recital of solo literature. 6+6+6 q.h.

807, 808, 809. Emphasis on the instrument in an orchestral role. Additional solo works to include Stravinsky. *Three Pieces;* Hindemith, *Concerto;* Nielsen, *Concerto;* Berg, *Four Pieces.* The presentation of a 60-minute public recital. 6+6+6 q.h.

Concentration Courses

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

604, 605, 606. See Clarinet 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Clarinet 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Clarinet 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Studies such as Klose, Book 1. Solos such as Schumann, *Phantasiestucke;* Finzi, *Bagatelles;* and Debussy, *Petite Piece.* 2+2+2 q.h.

601, 602, 603. Rose, *40 Etudes;* Langenus, *Studies.* Solos such as Mozart, *Adagio from Concerto;* Krenek, *Suite;* Gaubert, *Romance;* and selections from *Contest* and *Concert Collection* by Voxman. 2+2+2 q.h.

701, 702, 703. Studies and solos of the level indicated for Clarinet 507, 508, 509. 2+2+2 q.h.

801, 802, 803. Studies and solos of the level indicated for Clarinet 607, 608, 609. 2+2+2 q.h.

Non-Degree Course

500. Remedial study for applicants who do not qualify for Clarient 504. May be repeated twice. 2 non-degree q.h.

Oboe
Major Courses

504, 505, 506. Studies compatible with the student's training and the development of technic, articulation, phrasing and tone quality. Repertoire to include representative selections such as Handel, *Sonatas 1, 2 and 3;* Sammartini, *Sonata in G;* Eichner, *Concerto in C;* and Fischer, *Concerto in C.* 4+4+4 q.h.

607, 608, 609. Continued development of technic, articulation, phrasing and tone quality. Repertoire expanded to include Nielsen, *Romance* and *Humoresque;* Handel, *Concerto in G Minor;* Vivaldi, *Concerto in D Minor;* and Saint Saens, *Sonata.* 6+6+6 q.h.

707, 708, 709. Emphasis on the instrument in a chamber role and the study of solo works such as Palidilhe, *Concertante;* Hindemith, *Sonata;* Haydn, *Concerto in C;* Mozart, *Concerto K. 314;* Horovitz, *Sonatina, Op. 3;* F. Reizenstein, *Sonatina and Three Concert Pieces.* Presentation of a 30-minute public recital. 6+6+6 q.h.

807, 808, 809. Emphasis on the instrument in an orchestral role including the memorization of major orchestral passages. Additional solo works to include Piston, *Suite;* Jacob, *Rhapsody for English Horn;* Vaughan Williams, *Concerto;* Gordon Jacob, *Concerti No. 1 and 2.* Presentation of a 60-minute public recital. 6+6+6 q.h.

Concentration Courses

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

604, 605, 606. See Oboe 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Oboe 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Oboe 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Studies such as Gekeler, *Books I and II;* Rubank series and Andraud, *Practical and Progressive Method.* Solos such as Bakaleinikoff, *Elegy;* Handel, *Sonata No. 1;* Watner, *Three Pastorales;* Corelli-Barbirolli, *Concerto.* 2+2+2 q.h.

601, 602, 603. Continuation of Gekeler studies; Rubank series and Andraud, *Practical Method.* Solos such as Handel, *Sonatas, Gliere, Chanson;* Bach, *Three Little Pieces;* Klemke, *Pastorale;* Pergolisi-Barbirolli, *Concerto.* 2+2+2 q.h.

701, 702, 703. Studies and solos of the level for Oboe 504, 505, 506. 2+2+2 q.h.

801, 802, 803. Studies and solos of the level for Oboe 604, 605, 606. 2+2+2 q.h.

Non-Degree Course

500. Remedial study for applicants who do not qualify for Oboe 504. May be repeated twice. 2 non-degree q.h.

Bassoon
Major Courses

504, 505, 506. Studies compatible with the student's training and the development of technic, articulation, phrasing and tone qual-

ity. Repertoire to include representative selections such as Hindemith, *Sonata;* Bordeau, *Premiere Solo;* David, *Concertino;* Galliard, *Six Sonatas.* 4+4+4 q.h.

607, 608, 609. Continued development of technic, articulation, phrasing and tone quality. Repertoire expanded to include Mozart, *Concerto K. 191;* Bach, *Concerto in E-flat;* Cascarino, *Sonata;* Graun, *Concerto in B-flat;* selected Vivaldi *Concerti.* 6+6+6 q.h.

707, 708, 709. Emphasis on the instrument in a chamber role. Mozart, *Divertimenti;* Beethoven duos; Villa-Lobos, duo; Piston, trio; standard quintet literature. The presentation of a 30-minute public recital of solo literature. 6+6+6 q.h.

807, 808, 809. Emphasis on the instrument in an orchestral role. The memorization of major orchestral passages. Additional solo literature to include Etler, *Sonata;* Jacob, *Concerto;* Saint Saens, *Sonata;* Bozza, *Concertino.* The presentation of a 60-minute public recital. 6+6+6 q.h.

Concentration Courses

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

604, 605, 606. See Bassoon 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Bassoon 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Bassoon 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Studies such as Rubank series: Weissenborn, *Op. 8 Book I;* Solos to include Marcello, *Sonatas* and Boerlin, *Soliloquy.* 2+2+2 q.h.

601, 602, 603. Continuation of Weissenborn Op. 8 advanced studies and Rochut, Melodius Etudes, Book 1. Solos to include Eccles, *Sonata in G Minor* and Galliard, *Suites.* 2+2+2 q.h.

701, 702, 703. Studies to develop technic, articulation, phrasing and tone quality. Repertoire to include Fasch, *Sonata;* Hindemith, *Sonata;* Galliard, *Sonatas.* 2+2+2 q.h.

801, 802, 803. Studies and solos of the level indicated for Bassoon 607, 608, 609. 2+2+2 q.h.

Non-Degree Course

500. Remedial study for applicants who do not qualify for Bassoon 504. May be repeated twice. 2 non-degree q.h.

Saxophone
Major Courses

504, 505, 506. Studies compatible with the student's training and the development of technic, articulation, phrasing and tone quality. Repertoire to include Eccles, *Sonata (Viola de Gamba);* Handel, *Sonata No. 3* (Violin); Lantier, *Sicilienne;* Bona, *Rhythmical Articulations.* 4+4+4 q.h.

607, 608, 609. Continued development of technic, articulation, phrasing and tone quality. Repertoire expanded to include Debussy, *Rhapsodie for Saxophone;* Creston, *Sonata;* Glazounov, *Concerto in E-flat.* 6+6+6 q.h.

707, 708, 709. Review of all materials with emphasis on increased technical facility. Repertoire includes Bozza, *Concertino;* Dubois, *Concerto;* Bonneau, *Concerto.* The presentation of a 30-minute public recital. 6+6+6 q.h.

807, 808, 809. Greater emphasis on sight reading and chamber works. Repertoire to include Ibert, *Concertino da Camera;* Bernier, *Homage a Sax;* Bozza, *Piece Breve;* Creston, *Concerto.* The presentation of a 60-minute public recital. 6+6+6 q.h.

Concentration Courses

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

604, 605, 606. See Saxophone 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Saxophone 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Saxophone 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Studies such as DeVille, *Universal Method* and Hovey, *First Book of Practical Studies.* Solos to include Voxman, *Concert and Contest Collections;* Teal, *Solos for Saxophone Players.* 2+2+2 q.h.

601, 602, 603. Continuation of earlier studies expanded to include Small, *27 Melodious and Rhythmical Exercises;* Skornicka, *Supplementary Studies.* Solos to include Debussy, *En Bateau* and *La Fille aux Cheveux de Lin;* Reutter, *Elegie.* 2+2+2 q.h.

701, 702, 703. Studies and solos of the

level indicated for Saxophone 507, 508, 509. 2+2+2 q.h.

801, 802, 803. Studies and solos of the level indicated for Saxophone 607, 608, 609. 2+2+2 q.h.

Non-Degree Course

500. Remedial study for applicants who do not qualify for Saxophone 504. May be repeated twice. 2 non-degree q.h.

Brass Instruments
Trumpet
Minor Levels

501, 502, 503. Development of fundamentals through physical development exercises; study materials such as: Rubank *Elementary and Intermediate Methods;* Voxman, *Selected Studies;* Rubank, *Selected Duets;* Arban, *Complete Method.* Solo literature to include Balay, *Petite Suite;* Corelli, *Sonata #8;* Fitzgerald, *English Suite;* Fiocco, *Allegro.* 2+2+2 q.h.

601, 602, 603. Refinement of breathing and tonal fundamentals. Correct physical warm-up procedures; stress on sight-reading. Study materials: refer to 504-505-506 level for adaptation of suitable materials. Solo literature: refer to 504-505-506 level for adaptation of suitable materials. 2+2+2 q.h.

701, 702, 703. Continued development of fundamentals and technical facility. Continued stress on sight-reading. Study materials: refer to 604-605-606 level for adaptation of suitable material. Solo literature: refer to 604-605-606 level for adaptation of suitable literature. 2+2+2 q.h.

801, 802, 803. Participation in departmental solo and chamber performances. Transposition. Orchestral excerpts. Study material: refer to 704-705-706 level for suitable materials. Solo literature; refer to 704-705-706 level for suitable materials. 2+2+2 q.h.

Concentration Levels.

504, 505, 506. Development of basic fundamentals of breath and tonal control. Develop full physical potential. Sight reading. Introduce transposition techniques. Study material: H. Clarke, *Technical Studies;* W. Smith, *Lip Flexibilities;* Arban, *Complete Method;* Hering, *Etudes.* Solo literature: Balay, *Prelude and Ballade;* Handel-Fitzgerald, *Aria con Variazione;* Barat, *Fantasy in E-Flat; Andante and Scherzo.* 4+4+4 q.h.

604-605-606. Continued refinement of fundamentals and literature listed in the 500 levels. Orchestral excerpts and chamber literature. Extensive work on transposition and sight reading. Introduction of the C trumpet. Study materials: Schlossberg, *Technical Studies;* Clarke, *Characteristic Studies;* Pietsch, *Virtuosity Studies;* W. Smith, *Top Tones for the Trumpet;* Charlier, *36 Etudes.* Solo literature such as: Hummel, *Concerto in E-Flat;* Kennan, *Sonata;* Bohrnsdedt, *Concerto;* J. Stanley, *Trumpet Tune;* Flor Peeters, *Sonata.* 4+4+4 q.h.

704, 705, 706. Continued refinement of technical and tonal aspects of trumpet playing. Improvement of transposition ability. Introduction of the D trumpet. Continued experience on the C trumpet; further study of orchestral excerpts. Study materials such as: Nelson, *Top Tone Duets;* Petit, *Petite Studies,* Broiles, *Technical Studies,* Vol. I; Toldman, *Triple and Double Tonguing;* Tomasi, *Etudes.* Solo literature to include: Vidal, *Sonata;* Hindemith, *Sonata;* Gianinni, *Concerto;* Artumiam, *Concerto;* Stevens, *Sonata.* 4+4+4 q.h.

804, 805, 806. Continued refinement and study of materials listed in the previous levels. Extensive work on orchestral excerpt collections of Bartholody and Voisin. Preparation of senior recital. Solo literature such as: Jolivet, *Sonatina;* Tomasi, *Concerto;* D. White, *Sonata;* Telemann, *Concerto in D Major;* Haydn, *Concerto in E-flat.* 4+4+4 q.h.

Major Levels.

607, 608, 609. 707, 708, 709. 807, 808, 809. The major applied student will be required to function at a higher level than the concentration student. The course of study is similar except for materials changed to fit the needs of the student. Refer to concentration levels for Major level applied material. A half-hour junior recital and a one-hour senior recital will be required. 6+6+6 q.h.

FRENCH HORN
Minor Levels.

501-502-503; 601-602-603; 701-702-703; 801-802-803. Minor courses will differ from concentration courses in amount of work assigned. The requirements will be tailored to the ability and potential of each student.

Concentration Levels.

504-505-506. Establishment of a practice routine to promote fundamental skills; tone production, air control, embouchure, flexibility, legato-staccato articulation. Transposition. Sight reading. Orchestral excerpts taken

from music of Brahms, Tchaikovsky, Beethoven, Mendelssohn, A. Thomas. Study materials such as: Kopprasch, *60 Selected Studies*, Book I; Maxime-Alphonse, *70 Etudes*, Book I; Pottag & Andraud, *335 Studies*, Book I; Pares, *Daily Exercises and Scales*. Solo literature to include: Mozart, *Concerto #1*; Mozart, *Concerto #3*; Adler, *Sonata*; Barroff, *Sonata*; Saint-Saens, *Concert Piece*, Op. 44. 4+4+4 q.h.

604-605-606. Continued emphasis on fundamentals. Transposition. Sight reading. Orchestral excerpts: continuation of composers listed for 504-505-506, plus Rossini, Wagner, Dvorak, Franck, Weber. Study materials such as: Kopprasch, *60 Selected Studies*, Books I and II; Maxime-Alphonse, *40 Etudes*, Book II; Pottag & Andraud, *335 Studies*, Book I; Bach-Hoss, *Suites for Cello*. Solo literature to include: Beethoven, *Sonata*, Op. 17; Chabrier, *Larghetto*; Hindemith, *Sonata*; *Rosetti, Concerto in E-flat*. 4+4+4 q.h.

704-705-706. Further study of technical problems. Transposition; sight reading. Orchestral excerpts: Continuation of composers listed for 504-505-506, 604-605-606. Add Bizet, Massenet, Borodin, Rimsky-Korsakov. Begin Strauss, Stravinsky. Study materials such as: Kopprasch, 60 Selected Studies, Book II; Maxime-Alphonse *40 Etudes*, Book III; Gallay, *Studies and Preludes*; Bach-Hoss, *Suites for Cello*; Kling, *40 Characteristic Studies*,. Solo literature to include: Haydn, *Concerto #1*; Mozart, *Concerto #4*; R. Strauss, *Concerto #1*; Dukas, *Villanelle*; Wilder, *Sonata #3*. 4+4+4 q.h.

804-805-806. Continuing emphasis on fundamental technical problems. Transposition, sight reading. Senior recital. Orchestral excerpts: Continuation of composers listed for 504-505-506, 604-605-606; 704-705-706. Add Bach, Mozert, Haydn, Mahler, Schoenberg, and other 20th century composers. Study materials such as: Pottag & Andraud, *Selected Studies 305*, Book II; Bach-Hoss, *Suites for Cello*; Gallay, *Etudes and Preludes*; Maxime-Alphonse, *20 Etudes*, Book IV; Mueller, *22 Etudes*. Solo literature to include: Haydn, *Concerto #2*; Hindemith, *Concerto*; Mozart, *Concerto #2*; Tomasi, *Concerto*; Donato, *Concerto*. 4+4+4 q.h.

Major Levels.

607-608-609; 707-708-709; 807-808-809. Major courses will differ from concentration courses in amount of work assigned. The requirements will be directed toward a high level of professional performance with special attention to orchestral literature. Junior and senior recital requirement. 6+6+6 q.h.

Trombone
Minor Levels.

(Tenor and Bass Trombone). 501-502-503. Development of fundamentals. Material suited to the needs of the student. 2+2+2 q.h.

601-602-603. Continued development of fundamentals. Materials: see 504-505-506 Concentration. 2+2+2 q.h.

701-702-703. Continued development of fundamentals. Materials: see 604-605-606 Concentration. 2+2+2 q.h.

801-802-803. Continued development of fundamentals. Materials: see 704-705-706 Concentration. 2+2+2 q.h.

Concentration Levels.

504-505-506. Emphasis on all playing fundamentals. Establishment of a warm-up procedure. Establishment of good practice habits. Introduction to the F attachment. Introduction to tenor clef. Study materials such as: Tenor Trombone - Bordogni-Rochut, *Melodius Etudes*, Book I; Fink, *Introduction to Tenor Clef*; Blume-Fink, *36 Studies for Trombone with F attachment*. Bass Trombone - Ostrander *Method for Bass Trombone*; Ostrander, *Melodious Etudes for Bass Trombone*; Fink, *Introduction to Tenor Clef*. Solo materials to include: Tenor Trombone - Marcello, *Sonatas #1, #4, #6*; Jacob, *Concerto (1st Movement)*; Barat, *Andante et Allegro*. Bass Trombone - McCarty, *Sonata*; Mozart-Sansone, *Concert Rondo*; Galliard, *Sonata No. 5*. 4+4+4 q.h.

604-605-606. Continued emphasis on all playing fundamentals, warm-up and practice habits, and sight reading. Concentration on developing range, endurance, and dynamics. Continued work in tenor clef. Introduction of alto clef. Continued work with F attachment. Study materials such as: Tenor Trombone - Bordogni-Rochut, *Melodious Etudes*, Books I and II; Fink, *Introduction to Alto Clef*; Kopprasch, *60 Studies*, Book II. Bass Trombone - Bordogni-Rochut, *Melodious Etudes*; Tyrrell, *40 Progressive Etudes for Tuba*; Menken, *Orchestral Excerpts*, Books 1 and 2. Solo materials to include: Tenor Trombone - David, *Concertino*; Grafe, *Grand Concerto*; White, *Sonata*. 4+4+4 q.h.

704-705-706. Continued emphasis on all playing fundamentals, warm-up and practice habits, and sight reading. Continued study of orchestral excerpts. Study on Baritone horn is recommended. Emphasis on ensemble playing and playing "lead." Study materials such as: Tenor Trombone: Blazevich, *Clef Studies;* Bordogni-Rochut, *Melodious Etudes,* Book II; Pederson, *Intermediate Etudes for Tenor Trombone.* Bass Trombone: Bordogni-Rochut, *Melodious Etudes;* Blazevich, *Advanced Studies,* Book I for Tuba; Weissenborn, *Studies,* Book II for Bass Trombone. Solo Materials to include: Tenor Trombone - Hindemith, *Sonate;* Bozza, *Homage a Bach;* Casterede, *Sonatine.* Bass Trombone - Ross, *Prelude, Fugue and Big Apple;* Stevens, *Sonatina.* 4+4+4 q.h.

804-805-806. Culmination of all playing fundamentals in a solo recital. Introduction of study on the alto trombone. Perfection of orchestral audition repertoire. Study materials such as: Tenor Trombone - Bordogni-Rochut, *Melodious Etudes,* Book II; Pederson, *Advanced Etudes for Tenor Trombone;* Maxted, *20 Advanced Studies.* Bass Trombone White, *Tetra Ergon;* Persichetti, *Serenade for Unaccompanied Tuba;* Beversdorf, *Sonata for Tuba.* 4+4+4 q.h.

Major Levels.

607-608-609; 707-708-709; 807-808-809. Major courses will differ from concentration courses in amount of work assigned. The requirements will be directed toward a high level of professional performance with special attention to orchestral literature. Junior and senior recital requirement. 6+6+6 q.h.

Baritone Horn
Minor Levels

501-502-503. Emphasis on fundamentals. Study and solo materials suited to the needs and ability of the student. 2+2+2 q.h.

601-602-603. See Baritone Horn 504-505-506. 2+2+2 q.h.

701-702-703. See Baritone Horn 604-605-606. 2+2+2 q.h.

801-802-803. See Baritone Horn 704-705-706. 2+2+2 q.h.

Concentration Levels.

504-505-506. Study of fundamentals. Development of daily practice and warm-up routine. Knowledge of bass and treble clefs. Introduction to tenor clef. Study materials such as: Arban, *Complete Method;* Bordogni-Rochut, *Melodious Etudes,* Vol. I; Kopprasch, *60 Etudes,* Vol. I; Blume, *26 Etudes.* Solo literature to include: Galliard, *Sonata in G;* Barat, *Introduction and Dance;* Telemann, *Sonata in f;* Morel, *Piece in f;* Marcello, *6 Sonatas.* 4+4+4 q.h.

604-605-606. Continued emphasis on fundamentals. Introudction of alto clef. Study of orchestra and band parts. Emphasis on sight-reading. Study materials such as: Arban, *Complete Method;* Bordogni-Rochut, *Melodious Etudes,* Vols. I & II; Voxman, *Selected Etudes;* Bitsh, *20 Etudes.* Solo literature to include: Hindemith, *Bassoon Sonata;* Bach, *Cello Suites;* David, *Concertino;* Mozart, *Bassoon Concerto;* Whear, *Sonata;* Pryor, *Blue Bells of Scotland.* 4+4+4 q.h.

704-705-706. Continued study of orchestra and band parts. Study of trombone recommended. Study Materials such as: Smith, *Top Tones for Trumpet;* Bordogni-Rochut, *Melodious Etudes,* Vol. II; Bitsh, *20 Etudes.* Solo literature to include: Ross, *Partita;* Stevens, *Sonatina;* Jolivet, *Air;* Bach, *Sonata in G;* White, *Lyric Suite.* 4+4+4 q.h.

804-805-806. Continued study of orchestra and band parts. Study materials such as: Bozza, *13 Etudes Caprices;* Bordogni-Rochut, *Melodious Etudes,* Vol. III; Rieunier, *22 Dechiffranges Rythmiques.* Solo literature to include: Jacob, *Fantasia;* Bozza, *Hommage a Bach;* Yoshioka, *Extase;* Hindemith, *Trumpet Sonata;* Bach, *Sonata in d.* 4+4+4 q.h.

Major Levels.

607-608-609; 707-708-709; 807-808-809. Major courses will differ from concentration courses in amount of work assigned. The requirements will be directed toward a high level of professional performance with special attention to orchestral literature. Junior and senior recital requirement. 6+6+6 q.h.

TUBA
Minor Levels

501, 502, 503. Emphasis on fundamentals. Study and solo materials suited to the needs and ability of the student. 2+2+2 q.h.

601, 602, 603. See Tuba 504, 505, 506. 2+2+2 q.h.

701, 702, 703. See Tuba 604, 605, 606. 2+2+2 q.h.

801, 802, 803. See Tuba 704, 705, 706. 2+2+2 q.h.

Concentration levels.

504, 505, 506. Study of fundamentals.

Development of daily practice and warm-up routine. Playing of study and solo literature one octave lower. Study materials such as: Blazhevich, *70 Studies*, Vol. 1; Arban, *Complete Method;* Kopprasch, *60 Etudes*, Vol. 1; Bordogni-Rochut, *Melodious Etudes*, Vol. I. Solo literature to include: David, *Concertino;* Telemann, *Sonata in f;* Lebejew, *Konzert;* Marcello, *6 Sonatas;* Barat, *Introduction and Dance.* 4+4+4 q.h.

604, 605, 606. Introduction to tenor clef. Study of orchestra parts; study of chamber literature. Study materials such as: Blazhevich, *70 Studies*, Vol. II; Kopprasch, *60 Studies*, Vol. II; Barbatou; *Melodious Etudes*, Vols. I and II. Solo literature to include: Hindemith, *Sonata;* Mozart, *Concerto No. 3;* Blavet, *Sonata in g;* Vinci, *Sonata in D;* Wilder, *Sonata.* 4+4+4 q.h.

704, 705, 706. Continued study of orchestra parts. Continued study of chamber literature. Study materials such as: Bordongi-Rochut, *Melodious Etudes* Vols. I & II; Bitsch, *20 studies;* Maenz, *Zwolf Spezliastudien.* Solo literature to include: Schumann, *Adagio and Allegro;* Stevens, *Sonatina;* Bach, *Sonata in G;* Mozart, *Concerto No. 2;* Strauss, *Concerto No. 1.* 4+4+4 q.h.

804, 805, 806. Introduction to F tuba (if not already used). Continued study of orchestra parts. Continued study of chamber music. Study materials such as: Bordogni-Rochut, *Melodious Etudes*, Vol. III; Reynolds, *48 Etudes;* Sauter, *Eight Random Thoughts;* Karg-Elert, *30 Caprices.* Solo literature to include: Takacs, *Sonata Capricciosa;* Strauss, *Concerto No. 2;* Penn, *Three Essays;* Reynolds, *Sonata;* Woolf, *Per Tuba Ad Astram.* 4+4+4 q.h.

Major Levels.

607, 608, 609; 707, 708, 709; 807, 808, 809. Major courses will differ from concentration courses in amount of work assigned. The requirements will be directed toward a high level of professional performance with special attention to orchestral literature. Junior and senior recital requirement. 6+6+6 q.h.

PERCUSSION

This course of study is designed at various levels to gain a good perspective of Percussion playing with its varied demands of today. The primary purpose of a program in Percussion is to assist Percussion students in developing their performance skills to the highest possible level. Sight reading, tuning, phrasing, tempo, sticking, versatility and flexibility are the aims of a good percussionist. The following set of objectives should be kept in mind:

1. To improve solo performance;
2. To become a more valuable member of music groups;
3. To become familiar with the world's best music literature;
4. To develop special music talent;
5. To build a better foundation for a musical career.

Although the course codes are focused on one area of Percussion, the students will develop technics on mallet instruments, snare drum, drum set, accessories, timpani, and multi-percussion each quarter. Performing solos on these instruments will be during seminar classes.

Minor Levels.

501. *Snare Drum.* Fundamentals of snare drum, reading, and rudiments. *Stick Control* by George Stone; *Drum Method* by Roy Burns. Drum solos at this level. Major scales through 4 sharps and 4 flats and chromatic. One octave MM = 80. All rolls, 2 paradiddles, 2 flams, and 2 drags. 2 q.h.

502. *Fundamentals of Mallet Instruments. Mallet Control* by George Stone; First Book of *Practical Studies for Trumpet* by Getchell, Hovey. Mallet solos at this level. All major scales MM = 104. All rolls, 2 paradiddles, 5 flams and 5 drags. 2 q.h.

503. *Timpani.* Timpani Method by Friese and Lepak. Fundamentals of timpani, position, mechanics, attack, rolls, tuning, and ear training exercises. Timpani solos at this level. All major and natural minor scales one octave MM = 120. The standard 26 rudiments. 2 q.h.

601-602-603. Same instruments as 501-502-503 performed at a higher level. Additional studies: *Drum Method Book* II by Haskell Harr; *First Book of Practical Studies for* Clarinet by Nilo Hovey. Various solos at this level. For scale requirements see Concentration Level 506. 2+2+2 q.h.

701-702-703. Fundamentals in the playing of bass drum, cymbals, tambourine, castanets, triangle, and tam tam. Drum set swing and rock beat patterns, with sticks and brushes. Coordinated independence as applied to the drum set. Technics in the playing of latin percussion including drums, bongos, congas and timbales. For scale re-

quirement see Concentration Level 604. 2+2+2 q.h.

801-802-803. *Progressive Studies for Snare Drum* by Carl Gardner; *Contemporary Studies for Snare Drum* by Fred Albright; techniques of writing for marching percussion; multi-percussion solos. For scale requirements see Concentration Level 704. 2+2+2 q.h.

Concentration Levels.

504. *Mallet instruments. Mallet Control* by George Stone; *First Practical Studies for Trumpet* by Getchell-Hovey; *Second Practical Studies for Clarinet* by Nilo Hovey. Solos at this level. All major and natural minor scales and chromatic scales. One octave MM = 80. 4 q.h.

505. *Snare Drum. Drum Method II* by Haskell Harr; *Rudimental Swing Solos* by Charley Wilcoxon; *The All American Drummer* by Wilcoxon; *Modern Contest Solos* by Pratt. Snare drum solos by other writers. All major, natural minor and chromatic scales one octave MM = 104. All standard 26 drum rudiments. 4 q.h.

506. *Marching Percussion. Modern Reading Text in 4/4* by Louis Bellson. Technics of writing for marching percussion, standard and contemporary. All major, minor (natural, harmonic, melodic) and chromatic scales. One octave MM = 120. All standard 26 rudiments. 4 q.h.

604. *Mallet Instruments. Mallet Technique* by Firth; *Modern School for Mallets* by Goldenburg; *Streamlined Etudes* by Huffnagle; Book I and II *Solos for Marimba* by Jolliff; *Masterpieces for Marimba* by McMillan. Various solos at this level. All scales increased to 2 octaves. Major scales played broken and together in thirds. Major, minor, diminished, dominant and diminished seventh arpeggios, 2 mallets. All standard rudiments. 4 q.h.

605. *Drum Set. Advanced Techniques for the Modern Drummer* by Chapin; *Realistic Rock* by Appice; *Big Band Drum Charts* by Rothman; *Show Drumming* by Greene; *New Directions in Rhythm* by Morello. Latin beats applied to the drum set. Scales and arpeggios are the same as level 604 with increased tempo. 4 q.h.

606. *Timpani. Timpani Method* by Friese and Lepak; *Classic Overtures for Timpani* by Goldenberg; *The Solo Timpanist, 26 Etudes* by Firth. Various solos at this level. Scales and arpeggios are the same as 604 with tempo increased. 4 q.h.

704. *Percussion Accessories, Techniques of Playing Bass Drum, Cymbals and Accessories* by Al Payson; *Modern School for Snare Drum* by Goldenberg; *Contemporary Studies for Snare Drum* by Albright. A multiple percussion solo must be written using these instruments. All scales and arpeggios increased to 3 octaves. 4 mallets on chords and inversions. 4 q.h.

705. *Latin Percussion. Latin-American Rhythm Instruments and How to Play Them* by Henry Adler. Scales and arpeggios same as 704 with tempo increased. 4 q.h.

706. *Excerpts. The Snare Drum in the Concert Hall* by Payson; *Progressive Studies* by Gardner; *Modern School for Mallets* by Goldenberg; *Classic and Romantic Symphonies for Timpany* by Goldenberg. For scales and arpeggios see level 705. 4 q.h.

804. *Multi-percussion solos. Studies in Solo Percussion* by Toldenberg. Selection of recital pieces. Scales and arpeggios see level 704 with increased tempo. 4 q.h.

805. *Recital.* The preparation of a 30-minute recital. For scales and arpeggios see level 705 with increased tempo. 4 q.h.

806. *Writing Technics for Multi-percussion and Percussion Ensemble.* Scales and arpeggios see level 706 with increased tempo. 4 q.h.

Major Levels.

607-608-609	6+6+6 q.h.
707-708-709	6+6+6 q.h.
807-808-809	6+6+6 q.h.

The students will focus on the same areas of percussion as the applied concentration, but will be required to function at a higher level.

THEORY AND COMPOSITION

501. *Applied Theory.* Applied instruction in music theory of diatonic harmony which develops independent study and research projects in such areas as analysis, aural perception, scoring and arranging. May be repeated once. Prereq.: Permission of instructor. 2 q.h.

520. *Materials of Music.* An overview of musical styles, listening concepts, and harmonic technics as they relate to the literature of music. For students who do not qualify for Music 570. Meets four times a week. 4 q.h.

570, 571, 572. *Theory I.* A study of diatonic materials used in tonal music which includes ear training, sight singing, keyboard harmony,

written harmony, and the harmonic and formal analysis of phrase structures. Credit for 572 requires a grade of *C* or better. Meets 5 hours per week. Prereq.: Music 520 or a grade of *B* or better on the theory placement test for entering freshmen. 4+4+4 q.h.

601. *Applied Theory.* Applied instruction in music theory of chromatic harmony which develops independent study and research projects in such areas as analysis, aural perception, scoring and arranging. May be repeated once. Prereq.: Permission of instructor. 2 q.h.

504, 505, 506. *Composition A*
604, 605, 606. *Composition B*

Composition for Majors. Instruction in the creative use of the materials of music including beginning study of instrumentation and composition of short works for solo and chamber media. Study is coordinated with analysis of representative compositions in various styles. Prereq.: grade of *B* or better in lower division theory courses, or concurrent with Music 570, 571, 572. 2 q.h. each

704, 705, 706. *Composition C*

804, 805, 806. *Composition D*

Composition for Majors. Private instruction employing contemporary techniques, compositions will include pieces for solo instruments, vocal and instrumental chamber groups and large ensembles. Special care is given to the editing and proofreading of scores (and parts) so that all compositions are prepared for performance or to submit for publication. A recital of at least one-hour duration will be presented of selected works of the student as a requirement for graduation. Prereq.: Music 606, 706. 4 q.h. each

610, 611, 612. *Theory II.* A study which adds the chromatic materials used in tonal music and includes ear training, sight singing, keyboard harmony, written harmony, and the harmonic and formal analysis of single compositions or selected movements from large works. Credit for 612 requires a grade of *C* or better. Prereq.: Music 572. 4+4+4 q.h.

701. *Applied Theory.* Applied instruction in music theory of modal and/or non-tonal music which will develop independent study and research projects in such areas as analysis, aural perception, scoring and arranging. May be repeated once. Prereq.: Permission of instructor. 2 q.h.

750. *Analytical Techniques.* Analysis of representative repertoire from the Renaissance, Baroque, Classical, Romantic, and Contemporary periods. Prereq.: Music 612. 4 q.h.

820, 821, 822. *Composition.* Composition in two- and three-part forms and other compositions of small scope, such as variation and sonatina. Works will be composed for piano alone, and in combination with other instruments or voice. May be repeated by composition majors to meet requirements for Composition A and Composition B. Prereq.: Music 612, or by permission of the instructor for composition majors. 2+2+2 q.h.

830. *Materials of Twentieth Century Music.* A study of the various elements of twentieth century composition, including melody, harmony, rhythm, texture, and form. Prereq.: Music 612. 3 q.h.

831. *Counterpoint I.* 16th century contrapuntal style including introduction of species technique; analysis of liturgical and secular repertoire; creative assignments in writing imitative counterpoint with stylistic rhythms and cadences. Prereq.: Music 612. 3 q.h.

832. *Counterpoint II.* Contrapuntal style of Baroque music including analysis of examples in imitative and invertible counterpoint; creative assignments in writing 2- and 3-part inventions and 3- and 4-part fugal expositions. Prereq.: Music 612. 3 q.h.

833. *Theory Seminar.* Selected topics in Music Theory not covered in regular upper division offerings. May be repeated once with different topic. Prereq.: Music 750 and 772, and permission of instructor. 3 q.h.

840. *Instrumentation.* Study of ranges, transposition, technical characteristics and tonal features of the instruments. Scoring for large and small ensembles which are available as laboratory reading groups. Prereq.: Music 612. 4 q.h.

MUSIC HISTORY AND LITERATURE

709, 710, 711. *History and Appreciation of Art and Music: General.* Identical with Art 709, 710, 711. 4+4+4 q.h.

770, 771, 772. *Music History and Literature.* A study of music from earliest times to the present with special reference to the relation of the history of music to that of other arts and to the political and religious history of the corresponding period. The orientation of musical literature to the periods in which it was written and the style of individual composers are also stressed. Prereq.: Music

571 (or 621 for the non-music major). 4+4+4 q.h.

852. *Woodwind Literature.* An historical survey of solo and ensemble literature of the woodwind family with emphasis on the evolution of woodwind instruments and the development of their respective literatures. Prereq.: Music 772. 3 q.h.

860. *Piano Literature.* A chronological investigation of solo piano works by major composers from Bach to Cage. Prereq. or concurrent: Music 770, 771, 772. 4 q.h.

869. *Organ Literature.* A study of the organ and its literature from the earliest times to the present day. Prereq.: Music 612 and 772. 3 q.h.

871. *Baroque Music.* Trends in musical thought and stylistic developments during the period 1600-1750. A survey of the literature of the time: opera from Monteverdi to Handel; keyboard and instrumental works; significant choral and orchestral works, etc. Prereq.: Music 612 and 772. 3 q.h.

872. *Eighteenth Century and the Viennese Classical School.* Musical developments from the decline of the Baroque to the turn of the century; stylistic elements contributing to the rise of classicism and culminating in the works of Mozart, Haydn, and Beethoven. Prereq.: Music 612 and 772. 3 q.h.

873. *Opera History.* An historical survey of opera; its development as an art form from its beginnings to the present. Prereq.: Music 612 and 772. 3 q.h.

874. *Nineteenth Century: Romantic Period.* Musical developments from Schubert through Wagner; aesthetic, formal, and technical trends with special emphasis on nationalism and the music drama. Prereq.: Music 612 and 772. 3 q.h.

875. *Contemporary Music.* See Music 830.

878. *Selected Topics in Music History.* A study of a specific topic to be announced each time the course is offered. May be repeated once with different topic. Prereq.: Music 612 and 772. 3 q.h.

879. *Vocal Literature.* A study of vocal literature from all periods. Special emphasis on English language repertoire and on material especially suitable for high school students. Songs are prepared for performance in class. Prereq.: Music 612 and 772. 3 q.h.

884. *History and Literature of Brass Instruments.* A study of the history and literature of brass instruments with emphasis on the evolution of brass in the orchestra, solo literature, chamber music literature, and bibliography. Prereq.: Music 612 and 772. 3 q.h.

CONDUCTING

738. *Vocal Conducting Methods Ensemble.* Vocal conducting technics and ensemble methods as they apply to choral group; rehearsal practices; special choral problems. Effort is made to enlarge the student's expressive resources as a conductor and to develop ability to discover the implicarions of the score. Students sing in class, providing a chorus for practice in conducting. Each student conducts the University Chorus during the last day of the quarter. Prereq.: Music 611 with a grade of *B* or better, or Music 612. 3 q.h.

739. *Instrumental Conducting Methods Ensemble.* Instrumental conducting technics and ensemble methods as they apply to bands, orchestras and chamber ensembles; rehearsal practices; special instrumental problems. Effort is made to enlarge the student's expressive resources as a conductor and to develop ability to discover the implications of the score. Four classes per week. Students perform on major and/or minor instruments providing an ensemble for practice in conducting. Students also conduct one of the bands at the conclusion of the quarter. Prereq.: Music 611 with a grade of B or better, or Music 612. 3 q.h.

MUSIC EDUCATION

521. *Introduction to Music Fundamentals.* Development of skill in reading music through singing, conducting, and elementary keyboard experience. For non-music majors. 3 q.h.

555. *Guitar Class.* A study of the guitar at the beginning level to explore techniques and approaches appropriate to school music instruction. Each class meets 2 hrs. per week, and a minimum level of performance is required. 1 q.h.

621. *Music Literature and Appreciation.* Emphasis on the development of listening technics that can be applied to music of western and non-western cultures through the comparison and contrast of music of significant historical periods. For non-music majors. Prereq.: Music 521. 4 q.h.

655. *Clarinet Class.* A study of the clarinet and saxophone at the beginning level to explore techniques and approaches appropriate to school music instruction. Each class meets

2 hrs. per week, and a minimum level of performance is required. 1 q.h.

656. *Trumpet Class.* A study of the trumpet at the beginning level to explore techniques and approaches appropriate to school music instruction. Each class meets 2 hrs. per week, and a minimum level of performance is required. 1 q.h.

657. *Violin/Viola Class.* A study of the violin and viola at the beginning level to explore techniques and approaches appropriate to school music instruction. Each class meets 2 hrs. per week, and a minimum level of performance is required. 1 q.h.

658. *Snare Drum Class.* A study of the snare drum at the beginning level to explore techniques and approaches appropriate to school music instruction. Each class meets 2 hrs. per week, and a minimum level of performance is required. 1 q.h.

659. *Voice Class.* A study of voice at the beginning level to explore techniques and approaches appropriate to school music instruction. Each class meets 2 hrs. per week, and a minimum level of performance is required. May be repeated. 1 q.h.

721. *Music Education for Elementary Teachers.* Discussion and demonstration of repertoire, techniques and teaching aids required for teaching music in the elementary school. Prereq.: Music 621 and admission to the School of Education. 3 q.h.

722. *Music in Early Childhood.* Discussion and demonstration of repertoire, materials and technics for teaching music to pre-school and kindergarten children. 3 q.h.

734, 735, 736. *String Pedagogy.* An examination of the problems of studio teaching. Survey of grades and levels of teaching, string literature, psychological aspects of individual instruction, and teaching devices. Demonstration with students in a teaching situation. 1+1+1 q.h.

755. *Flute Class.* A study of the flute at the beginning level to explore techniques and approaches appropriate to school music instruction. Each class meets 2 hrs. per week, and a minimum level of performance is required. Prereq.: Music 655. 1 q.h.

756. *Oboe/Bassoon Class.* A study of the oboe and bassoon at the beginning level to explore techniques and approaches appropriate to school music instruction. Each class meets 2 hrs. per week and a minimum level of performance is required. Prereq.: Music 655. 1 q.h.

757. *Horn/Baritone/Tuba Class.* A study of the horn, baritone, and tuba at the beginning level to explore techniques and approaches appropriate to school music instruction. Each class meets 2 hrs. per week and a minimum level of performance is required. Prereq.: Music 656. 1 q.h.

758. *Trombone Class.* A study of the trombone at the beginning level to explore techniques and approaches appropriate to school music instruction. Each class meets 2 hrs. per week, and a minimum level of performance is required. Prereq.: Music 656. 1 q.h.

759. *Cello/Bass Class.* A study of the cello and bass at the beginning level to explore techniques and approaches appropriate to school music instruction. Each class meets 2 hrs. per week, and a minimum level of performance is required. Prereq.: Music 657. 1 q.h.

760. *Mallet Percussion Class.* A study of the mallet percussion instruments at the beginning level to explore techniques and approaches appropriate to school music instruction. Each class meets 2 hrs. per week, and a minimum level of performance is required. Prereq.: Music 658. 1 q.h.

761. *Percussion Accessories Class.* A study of percussion accessories at the beginning level to explore techniques and approaches appropriate to school music instruction. Each class meets 2 hrs. per week, and a minimum level of performance is required. Prereq.: Music 658. 1 q.h.

823. *Music Teaching in the Elementary School.* A study of the role of music in the life of the child. An examination of principles, repertoire, and techniques of teaching. Prereq.: Admission to the School of Education. 3 q.h.

824. *Music Teaching in the Middle School.* Music, materials, and methods of instruction in middle schools and junior high schools with emphasis on the general music class and the adolescent voice. Prereq.: Admission to the School of Education. 3 q.h.

825. *Music Teaching in the Secondary School.* Methods of organizing and conducting instrumental and vocal classes, bands, orchestras, and choruses in the public schools. Special areas and devices unique to music teaching are surveyed in detail. Prereq.: Admission to the School of Education. 3 q.h.

839. *Marching Band Technics.* Organizing, administrating, and teaching the marching

band. Basic and advanced marching procedures with a concentrated study of gridiron charting, precision drill, formations, instrumentation, special effects and show ideas; arranging for field playing. Students will write an entire show of field maneuvers and one special arrangement by the conclusion of the quarter. Three classes per week. 3 q.h.

841. *Music Workshop.* Designed to meet the needs of students and teachers in service; workshops may vary from year to year in emphasis and personnel. Specific topics will be announced each time the workshop is offered. May be repeated. 1-4 q.h.

Music 851. *Woodwind Pedagogy.* Various teaching approaches to each of the woodwind instruments with special emphasis on doubling problems. Basic concepts of tone production, embouchure and study materials utilizing extensive demonstration by students and faculty. Prereq.: Music 506 or 509. 3 q.h.

858, 859. *Piano Pedagogy.* A survey of methods and study of materials involved in teaching of piano. Pedagogical considerations include fundamentals of technic as well as repertoire. Supervised practice teaching. 2+2 q.h.

880, 881. *Vocal Pedagogy.* A comparative study of physiological and psychological approaches to voice instruction and their application to private and class teaching. In the second quarter, supervised teaching of selected beginning singers will be required. Prereq.: Music 603, 606, or 609. 2+2 q.h.

885. *Brass Pedagogy.* Designed for the brass major to study the various teaching approaches to each of the brass instruments. Basic concepts of tone production will be emphasized on each brass instrument, stressing common features as well as differences. Brass study materials will be introduced and analyzed. Teaching demonstrations by faculty members and students will be included. Prereq.: Brass 506 or 509. 3 q.h.

APPLIED CLASSES

A series of instrumental and vocal classes at the beginning level to explore technics and approaches appropriate to school music instruction.

555. Guitar. No prereq. 1 q.h.

655. Clarinet/Sax. No prereq. 1 q.h.

656. Trumpet. No prereq. 1 q.h.

657. Violin/Viola. No prereq. 1 q.h.

658. Snare Drum. No prereq. 1 q.h.

659. Voice. May be repeated. 1 q.h.

755. Flute. Prereq.: Mus. 655. 1 q.h.

756. Oboe/Bassoon. Prereq.: Mus. 655 1 q.h.

757. Horn/Baritone/Tuba. Prereq.: Mus. 656 1 q.h.

758. Trombone. Prereq.: Mus. 656. 1 q.h.

759. Cello/Bass. Prereq.: Mus. 657. 1 q.h.

759. Cello/Bass. Prereq.: Mus. 657. 1 q.h.

760. Mallet Percussion. Prereq.: Mus. 658 1 q.h.

761. Percussion Accessories. Prereq.: Mus. 658 1 q.h.

KEYBOARD MUSICIANSHIP CLASSES

580, 581, 582. *Keyboard Musicianship I.* Elements of keyboard technique, with emphasis on sight-reading, interpretation of simple music, harmonization, transposition, and analysis. All major and minor scales and related chords, hands together. Required of all non-keyboard majors. Must be taken in sequence. 1+1+1 q.h.

590, 591, 592. *Keyboard Musicianship for Keyboard Majors.* Laboratory and ensemble experience to develop skill in sight-reading, transposition, analysis, harmonization, modulation, and multi-part score-reading. Must be taken in sequence. 1+1+1 q.h.

680, 681, 682. *Keyboard Musicianship II.* A continuation and intensification of studies begun in Music 580, 581, 582, with emphasis on accompanying, modulation, repertoire, and stylistic analysis. Must be taken in sequence. 1+1+1 q.h.

690, 691, 692. *Accompanying I.* A study of techniques useful in playing the piano for vocalists, with supervised studio and recital experience. May be repeated for credit. Prereq.: Music 592. 1+1+1 q.h.

693, 694, 695. *Accompanying II.* A study of techniques useful in playing the piano for instrumentalists, with supervised studio and recital experience. May be repeated for credit. Prereq.: Music 592. 1+1+1 q.h.

790, 791, 792. *Piano Duet- and Duo-Playing.* Investigation and performance of works for four hands at one or two pianos, such as Mozart, *Sonata,* K. 448; Schubert, *Fantasy,* Op. 103; Debussy, *En blanc et noir;* and Stravinsky, *Sonata.* Prereq.: Music 592. 1+1+1 q.h.

890, 891, 892. *Chamber Music with Piano.* Preparation of trios, quartets, and quintets including string and wind instruments. Analysis of problems encountered in ensemble performance. May be repeated for credit. Prereq.: Music 695. 1+1+1 q.h.

ACCOMPANYING

690A, 691A, 692A. *Accompanying I.* A study of technics useful in playing the piano for vocalists, with supervised studio and recital experience. For Accompanying majors only. Prereq.: Music 592. 2+2+2 q.h.

693A, 694A, 695A. *Accompanying II.* A study of technics useful in playing the piano for instrumentalists, with supervised studio and recital experience. For Accompanying majors only. Prereq.: Music 592. 2+2+2 q.h.

865. *Instrumental Repertoire for Accompanists.* Study and performance of duo literature for piano and other instruments, including works of Mozart, Weber, Brahms, Debussy and Hindemith as well as other 20th Century composers. Prereq.: Music 695. 4 q.h.

895. *Advanced Vocal Accompanying.* Study and refinement of vocal accompanying technics. Supervised preparation for a recital of at least 30 minutes to be perofrmed during the quarter. Prereq.: Music 692 and 879. 4 q.h.

896. *Advanced Instrumental Accompanying.* Study and refinment of instrumental accompanying technics. Supervised preparation for a recital of at least 30 minutes to be performed during the quarter. Prereq.: Music 695 and 865. 4 q.h.

ENSEMBLES

To enable students in music to have a wide experience in the performance of music written for large instrumental and vocal groups, they are required to participate in ensembles as follows:

All vocal and instrumental majors are required to be in a major ensemble for each quarter of the four years.* Major ensembles are Orchestra, Wind Ensemble, Concert Band, Concert Choir and University Chorus. Keyboard majors follow the ensemble program specified in their curriculums.

Several ensemble courses are open to all students of the University who are qualified for them; however, the awarding of credit for any ensemble course presupposes satisfactory participation. Three hours of Marching Band credit may be substituted for three hours of the general requirement in physical activity courses.

Any ensemble course may be repeated any number of quarters. The following ensembles are open to any student in the University who can qualify:

002 *Concert Choir* ..... 1 q.h.
003 *Madrigal Singers* ..... 1 q.h.
004 *University Chorus* ..... 1 q.h.
005 *Concert Band* ..... 1 q.h.
006 *Marching Band* ..... 1 q.h.
007 *Symphonic Wind Ensemble* ..... 1 q.h.
008 *Symphony Orchestra* ..... 1 q.h.
009 *Percussion Ensemble* ..... 1 q.h.
010 *String Ensemble* ..... 1 q.h.
011 *Men's Chorus* ..... 1 q.h.
012 *Opera Workshop.*
Open to all students of the University who are interested in the art of lyric theatre. Students may audition for roles, in which they will be prepared musically and dramatically. In a practical working atmosphere, students become exposed directly to the practical problems of lighting, set construction, costuming and makeup. Both singers and stage crew may acquaint themselves with the history of opera, costume history, and general information about the opera. The course culminates in the production of one or more operas. Credit may be taken in accordance with the amount of work to be undertaken by the student. 1-3 q.h.

016 *Woodwind Ensemble*
Outgrowths of the Woodwind Ensemble would include quartets, quintets and various combinations of instruments at 1 q.h. each.

017 *Brass Ensemble*
Outgrowths of the brass program also include:
Trombone Choir ..... 1 q.h.
Tuba Choir ..... 1 q.h.
Horn Choir ..... 1 q.h.
023 *Jazz Ensemble I* ..... 1 q.h.
024 *Jazz Ensemble II* ..... 1 q.h.
025 *Jazz Improvisation* ..... 1 q.h.

A laboratory experience in jazz technics, with emphasis on analysis of harmonic progressions, form, style, and performance requirements of the jazz idiom.

026 *Chamber Orchestra* ..... 1 q.h.

026 *Chamber Orchestra* ..... 1 q.h.

All string majors are required to participate in String Orchestra as well as the Symphony Orchestra.

*The director may waive ensemble participation in exceptional cases and during the student teaching quarter.

CURRICULUMS

Curriculum for the Degree of Bachelor of Music with Major in Piano, Organ or Harpsichord

FIRST YEAR	Hrs.
Performance major 504, 505, 506	12
Piano 501, 502, 503*	6
Keyboard Musicianship 590, 591, 592	3
Theory 570, 571, 572	12
Composition 550, 551	8
Soc. Stud. electives**	8
Health Education 590	3
	52

SECOND YEAR	Hrs.
Performance Major 607, 608, 609	18
Theory 610, 611, 612	12
Accompanying 690, 691, 692	3
Soc. Stud./Science/Math electives	16
	49

THIRD YEAR	Hrs.
Performance Major 707, 708, 709	18
Music History 770, 771, 772	12
Analytical Technics 750	4
Music Theory electives	6
Accompanying 693, 694, 695	3
Piano Duo 790, 791, 792***	3
Large Ensemble*	3
H&PE Activities	3
	52

FOURTH YEAR	Hrs.
Performance Major 807, 808, 809	18
Piano Pedagogy 858, 859	4
Piano or Organ Literature	3-4
Music History elective	3
Theory, Hist./Lit., or Conducting electives	9
Large Ensemble*	3
Piano Chamber Music 890, 891, 892***	3
Physics 608 Sound	4
	47-48
Total	**200-201**

*Organ and harpsichord majors only.
**Must include at least 16 q.h. of social studies and at least 8 q.h. of science/mathematics.
***Piano majors only.

Curriculum for the Degree of Bachelor of Music with Major in Accompanying

FIRST YEAR	Hrs.
Piano 504, 505, 506	12
Keyboard Musicianship 590, 591, 592	3
Theory 570, 571, 572	12
English Composition 550, 551	8
Social Studies electives	9
H & PE 590	3
	47

SECOND YEAR	Hrs.
Piano 604, 605, 606	12
Theory 610, 611, 612	12
Accompanying 690A, 691A, 692A	6
Social Study electives	7
Math/Science electives	8
Language electives	8
	53

THIRD YEAR	Hrs.
Piano 704, 705, 706	12
Music History 770, 771, 772	12
Analytical Technics 750	4
Accompanying 693A, 694A, 695A	6
Piano Duo 790, 791, 792	3
H & PE Activities	3
Major Ensemble Elective	3
Vocal Literature 897	3
Music Elective	3
Language Elective	4
	53

FOURTH YEAR	Hrs.
Piano 804	4
(Harpsichord 504, 505)	8
Physics of Sound 608	4
Piano Literature 860	4
Instrumental Repertoire for Accompanists 865	4
Piano with Chamber Music 890, 891, 892	3
Advanced Vocal Accompanying 895	4
Advanced Instrumental Accompanying 896	4
Music electives	6
Vocal or Instrumental Conducting	4
	48
Total	**198**

Curriculum for the Degree of Bachelor of Music with Instrumental Major

FIRST YEAR	Hrs.
Performance major 504, 505, 506	12
Keyboard Musicianship 580, 581, 582	3

Theory 570, 571, 572	12
Composition 550, 551	8
Soc. Stu. electives**	8
Science Elective 590	4
Major Ensemble	3
	50

SECOND YEAR	Hrs.
Performance Major 607, 608, 609	18
Keyboard Musicianship II 680, 681, 682	3
Theory II 610, 611, 612	12
Music History 770, 771, 772	12
Major Ensemble	3
	48

THIRD YEAR	Hrs.
Performance Major 707, 708, 709	18
Theory (AT) 750	4
Theory elective	6
Major Ensemble	3
Conducting	3
Chamber Ensemble	3
Science elective	4
Science Physics 608	4
H&PE Activities	3
	48

FOURTH YEAR	Hrs.
Performance Major 807, 808, 809	18
Philosophy	4
Theory Hist/Lit., Conducting, Pedagogy	12
Major Ensemble	3
Social Studies electives	8
H&PE 590	3
	48
Total	**194**

MUSIC EDUCATION MAJOR: Instrumental, Vocal, Piano, or Organ

The following curriculums meet the requirements for the special provisional teaching certificate in Ohio. The certification requirements of the various states differ greatly, and if a student wishes to be certified in another state, it is the student's responsibility to fulfill the requirements of that state in the choice of courses. Courses satisfying such requirements usually give credit toward the degree, but some additional courses may be found necessary.

Curriculum for the Degree of Bachelor of Music with the Major in Music Education: Instrumental

FIRST YEAR	Hrs.
Instrument 504, 505, 506	12
Keyboard Musicianship I 580, 581, 582	3
Theory 570, 571, 572	12
Major Ensemble	3
Composition 550, 551	8
Education 501	3
Music Methods*	9
H&PE 590	3
	53

SECOND YEAR	Hrs.
Instrument 604, 605, 606	12
Keyboard Musicianship II 680, 681, 682	3
Theory 610, 611, 612	12
Music History 770, 771, 772	12
Major Ensemble	3
Mathematics elective	4
H&PE Activities	3
Educ. 704	3
	52

THIRD YEAR	Hrs.
Instrument 704, 705, 706	12
Applied Classes**	4
Theory: Analytical Tech. 750	4
Music Education 823	3
Conducting 738, 739	6
Major Ensemble	3
Education 706, 708	7
Chamber Ensemble	3
Physics 608 Sound	4
Psych. 560	4
Philosophy elective	4
	54

FOURTH YEAR	Hrs.
Instrument 804, 805	8
Music History elective	3
Music Education 824, 825 or 839	6
Major Ensemble	2
Education 709, 710, 843	23
Social Studies electives	4
Science electives	4
	50
Total	**209**

Curriculum for the Degree of Bachelor of Music with the Major in Music Education: Voice

FIRST YEAR	Hrs.
Voice 504, 505, 506	12
Keyboard Musicianship I 580, 581, 582	3
Theory 570, 571, 572	12
Major Ensemble	3
Composition 550, 551	8
Education 501	3
Applied Classes	9
	50

SECOND YEAR	Hrs.
Voice 604, 605, 606	12

Keyboard Musicianship II 680, 681, 682	3
Theory 610, 611, 612	12
Music History 770, 771, 772	12
Major Ensemble	3
Mathematics elective	4
Education 704, 706	6
	52

THIRD YEAR	Hrs.
Voice 704, 705, 706	12
Vocal Pedagogy 880, 881	4
Theory 750	4
Music Education 823	3
Conducting 738, 739	6
Major Ensemble	3
Philosophy or Religion	3
Education 708, 709	8
Physics 608 Sound	4
Psych. 560	4
	51

FOURTH YEAR	Hrs.
Voice 804, 805	8
Music History elective	3
Music Education 824, 825, or 839	6
Major Ensemble	2
Education 710, 843	19
Social Studies electives	4
H&PE 590 and Activities	6
Science elective	4
	52
Total	205

*Brass, wood wind, keyboard, string, and voice majors must take the appropriate pedagogy course.
**See *Applied Classes*.

Curriculum for the Degree of Bachelor of Music with Major in Music Education: Piano or Organ

FIRST YEAR	Hrs.
Piano or Organ 504, 505, 506	12
Theory 570, 571, 572	12
Voice 501, 502, 503*	6
Keyboard Musicianship 590, 591, 592	3
Composition 550, 551	8
Applied Classes	6
H&PE 590	3
	50

SECOND YEAR	Hrs.
Piano or Organ 604, 605, 606	12
Theory 610, 611, 612	12
Accompanying 690, 691, 692	3
Major Ensemble	3
Mathematics elective	4
Psychology 560	4
Psychology 709	4
Social Studies elective	4
Education 501, 704	6
	52

THIRD YEAR	Hrs.
Piano or Organ 704, 705, 706	12
Music History 770, 771, 772	12
Theory 750	4
Conducting 739	3
Piano or Organ Literature	3-4
Accompanying 693, 694, 695	3
Major Ensemble	3
Music Education 825 or 839	3
Education 706, 708	7
H&PE Activities	3
	53-54

FOURTH YEAR	Hrs.
Piano or Organ 804, 805	8
Music Education 823, 824	6
Conducting 738	3
Piano Pedagogy 858, 859	4
Major Ensemble	2
Physics 608 Sound	4
Education 710, 843	19
Science elective	4
Philosophy elective	4
	54
Total	209-210

*Organ concentrators must take Piano.

Curriculums for the Degree of Bachelor of Arts with Majors in Music

For the degree of Bachelor of Arts with the major in the history and literature of music, only the courses for the major are taken in the Dana School of Music. The others are taken in the College of Arts and Sciences, and are found in the section concerned with that college.

The major consists of 100 quarter hours and the elective hours must be used to establish a minor in a department other than the major.

Bachelor of Arts with Major in History and Literature of Music

FIRST YEAR	Hrs.
Instrument Minor 501, 502, 503	6
Theory 570, 571, 572	12
Ensemble	3
Music electives	6
Composition 550, 551	8
H&PE 590	3
Social Studies electives	8

Science elective	4
	50

SECOND YEAR	Hrs.
Instrument Minor 601, 602, 603	6
Theory 610, 611, 612	12
Music History 770, 771, 772	12
English Literature elective	3
H&PE Activities	3
Physics 608 Sound	4
Social Studies elective	4
Electives	4
Science elective	4
	52

THIRD YEAR	Hrs.
Instrument Minor 701, 702, 703	6
Theory electives	10
Music Hist/Lit elective	6
Music elective	8
Language	8-20
Social Studies elective	4
	42-54

FOURTH YEAR	Hrs.
Instrument Minor 801, 802, 803	6
Ensemble	3
Music History electives	6
Science/Math elective	4
Social Studies elective	4
Electives (700 or 800 level)	19
	42
Total	**186-198**

Bachelor of Arts with Major in Applied Music

FIRST YEAR	Hrs.
Instrument 504, 505, 506	12
Theory 570, 571, 572	12
Ensemble electives	3
Social Studies electives	12
Communication	8
	47

SECOND YEAR	Hrs.
Instrument 604, 605, 606	12
Theory 610, 611, 612	12
Music History 770, 771, 772	12
Social Studies electives	4
English Literature elective	3
Science elective	4
Physics 608 Sound	4
	51

THIRD YEAR	Hrs.
Instrument 704, 705, 706	12
Theory 750	4
Music History elective	6
Ensemble electives	3
Science elective	4
H&PE Actives	3
H&PE 590	3
Electives (700 or 800 level)	14
	49

FOURTH YEAR	Hrs.
Instrument 804, 805	8
Theory elective	3
Foreign language	8-20
Science/Math elective	4
Social Studies elective	4
Electives (700 or 800 level)	12
	39-51
Total	**186-198**

Bachelor of Arts with Major in Music Theory

FIRST YEAR	Hrs.
Instrument Minor 501, 502, 503	6
Theory 570, 571, 572	12
Ensemble	3
Music electives	6
Composition 550, 551	8
H&PE 590	3
Social Studies electives	4
Science elective	4
	46

SECOND YEAR	Hrs.
Instrument Minor 601, 602, 603	6
Theory 610, 611, 612	12
Music History 770, 771, 772	12
English Literature elective	3
H&PE Activities	3
Physics 608 Sound	4
Social Studies electives	8
	48

THIRD YEAR	Hrs.
Instrument Minor 701, 702, 703	6
Theory electives	10
Music Hist/Lit elective	6
Music electives	6
Language	8-20
Social Studies elective	4
	40-52

FOURTH YEAR	Hrs.
Instrument Minor 801, 802, 803	6
Ensemble	3

Music electives	6
Science/Math elective	4
Social Studies elective	4
Science elective	4
Electives (700 or 800 level)	25
	52
Total	**186-198**

Curriculum for the Degree of Bachelor of Music with Major in Voice

FIRST YEAR	Hrs.
Voice 504, 505, 506,	12
Keyboard Musicianship I 580, 581, 582	3
Theory 570, 571, 572	12
Major Ensemble	3
Composition 550, 551	8
Social Studies elective	8
Science Elective	4
	50

*Two units of High School French, German or Italian will satisfy that requirement.

Curriculum for the Degree of Bachelor of Music with Major in Composition

PIANO CONCENTRATION

FIRST YEAR	Hrs.
Composition 504, 505, 506*	6
Theory 570, 571, 572	12
Piano 501, 502, 503	6
Applied Minor Elective	4
Applied Classes	9
Major Ensemble	3
Composition 550, 551	8
	48

SECOND YEAR	Hrs.
Composition 604, 605, 606	6
Theory 610, 611, 612	12
Piano 601, 602, 603	6
Applied Minor Elective	2
Applied Classes	3
Major Choral Ensemble	3
Music History 770, 771, 772	12
Social Studies elective	4
Science elective	4
	52

THIRD YEAR	Hrs.
Composition 704, 705, 706	12
Piano 701, 702, 703	6
Applied electives	6
Ensemble electives	3
Theory 750, 753	7
Conducting	3
Social Studies electives	12
H&PE 590	3
	52

FOURTH YEAR	Hrs.
Composition 804, 805, 806	12
Applied electives	6
Theory 754	3
History/Literature elective	3
Music electives	6
Science elective	4
Physics 608 Sound	4
Ensemble	3
H&PE Activities	3
Philosophy Elective	4
	48
Total	**200**

NON-PIANO CONCENTRATION

FIRST YEAR	Hrs.
Composition 504, 505, 506*	6
Theory 570, 571, 572	12
Keyboard Musicianship I 580, 581, 582	3
Applied Music 501, 502, 503	6
Applied Classes	9
Major Ensemble	3
Composition 550, 551	8
H&PE Activity	1
	48

SECOND YEAR	Hrs.
Composition 604, 605, 606	6
Theory 610, 611, 612	12
Keyboard Musicianship II 680, 681, 682	3
Applied Music 601, 602, 603	6
Applied Minor	4
Major Choral Ensemble	3
Music History 770, 771, 772	12
H&PE Activities	2
H&PE 590	3
	51

THIRD YEAR	Hrs.
Compostion 704, 705, 706	12
Piano 501, 502, 503	6
Theory 750, 753	7
Conducting	3
Music electives	6
Ensembles	3
Social Studies electives	8
Science elective	4
	49

FOURTH YEAR	Hrs.
Composition 804, 805, 806	12
Piano 601, 602, 603	6
Applied elective	2
Theory 754	3
Music History/Literature elective	3
Ensembles	3
Music elective	3
Social Studies electives	8
Science electives	4
Physics 608 Sound	4
Philosophy elective	4
	52
Total	**200**

*See *Musical Proficiency.*

All performance courses are numbered by level and credit hours, and differ only by the performance area and the specific requirements outlined in syllabuses of performance study in each field, available on request.

Minor Courses

501, 502, 503	2+2+2 q.h.
601, 602, 603	2+2+2 q.h.
701, 702, 703	2+2+2 q.h.
801, 802, 803	2+2+2 q.h.

Concentration Courses

504, 505, 506	4+4+4 q.h.
604, 605, 606	4+4+4 q.h.
704, 705, 706	4+4+4 q.h.
804, 805, 806	4+4+4 q.h.

Major Courses

504, 505, 506	6+6+6 q.h.
607, 608, 609	6+6+6 q.h.
707, 708, 709	6+6+6 q.h.
807, 808, 809	6+6+6 q.h.

Non-degree Course

500. Remedial study for applicants not acceptable for 504. May be repeated twice. Not available in all applied programs. 2 non-degree q.h.

VOICE
KEYBOARD INSTRUMENTS: Piano, Organ Harpsichord
STRING INSTRUMENTS: Violin, Viola, Cello, String Bass, Guitar
WOODWIND INSTRUMENTS: Flute, Oboe, Clarinet, Bassoon, Saxophone
BRASS INSTRUMENTS: Trumpet, Horn, Trombone, Tuba, Baritone Horn
PERCUSSION

PERFORMANCE COURSE EQUIVALENCY TABLE

Q.H.	Course Number			
0		500		
2	501	504		
4	502			
6	503	505		
8	601			
10	602	506		
12	603			
14	701	604	607	
16	702			
18	703	605		
20	801		608	
22	802	606		
24	803			
26	901	704	609	
28	902			
30	903	705		
32			707	
34		706		
36				
38		804	708	
40				
42		805		

Q.H.	Course Number		
44			709
46	806		
48			
50	904		807
52			
54	905		
56			808
58	906		
60			
62			809
64			
66			
68			907
70			
72			
74			908
76			
78			
80			909
82			
84			

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M.A., Colorado State College, 1951;
Ed.D., University of Colorado, 1962.

EVERETTE C. ABRAM
Associate Professor of Geology
B.S., Fredonia State College, 1958;
M.S., University of South Dakota, 1963.

JOHN ADAMS
Assistant Professor of Military Science
B.S., Columbus College, 1971;
M.B.A., Youngstown State University, 1974.

SHAFFIQ AHMED
Professor of Chemical Engineering and Materials Science
B.E., University of Calcutta, 1954;
M.S., University of Illinois, 1958;
Ph.D., Case Institute of Technology, 1965;
P.E., England.

TAYLOR ALDERMAN
Associate Professor of English
B.A., Emory and Henry College, 1964;
M.A., University of Wyoming, 1965;
Ph.D., University of New Mexico, 1969.

CHARLES K. ALEXANDER, JR.
Associate Professor of Electrical Engineering
B.S.E.E., Ohio Northern University, 1965;
M.S., Ph.D., Ohio University, 1967, 1971;
P.E., Ohio.

DOMENICO B. ALIBERTI
Associate Professor of Foreign Languages and Literatures
Maturita' Classica, L. Valli University, Barcellona, Italy, 1950;
Laurea di Dottore in Lettere, University of Messina, Italy, 1959.

JOHN E. ALLEMAN
Associate Professor of Music
Mus.B., Mus.M., Michigan State University, 1951, 1961;
D.M.E., Indiana University, 1969.

GEORGE L. ALMOND
Professor of Marketing
B.S. in B.A., M.A., Ph.D., Ohio State University, 1951, 1955, 1963.

JOSEPH P. ALTINGER
Associate Professor of Mathematical and Computer Sciences
B.S., University of Dayton, 1956;
M.S., University of Pittsburgh, 1960;
Ph.D., Case Western Reserve University, 1969.

LAWRENCE E. AMADI
Assistant Professor of History
Dip.Ed., University of Ibadan, 1962;
B.A., Southwest Baptist College, 1967;
M.A., Ph.D., University of Missouri, 1972.

ROBERT A. AMEDURI
Professor of Education
B.S., Youngstown State University, 1943;
M.S. in Ed., Westminster College, 1962;
M.S., Case Western Reserve University, 1963;
Ph.D., Kent State University, 1971.

JOHN R. ANTON
Assistant Professor of Geography
B.S., University of Toronto, 1958;
M.A., Doctoris Philosophiae, University of Vienna, Austria, 1947, 1949.

DONALD R. ARNETT
Assistant Professor of Mechanical Engineering
B.E., Youngstown State University, 1963;
M.S., University of Pittsburgh, 1967;
P.E., Ohio.

ROBERT E. ARNOLD
Associate Professor of Accounting and Finance
B.S., Miami University, 1958;
M.A., Gannon College, 1971;
C.P.A., Ohio.

GLORIA M. ATKINS
Instructor in Business Education and Technology
A.A., Los Angeles City College, 1966;
B.S. in Ed., M.S. in Ed., Youngstown State University, 1970, 1972.

GILBERT A. ATKINSON
Assistant Professor of Psychology
B.S., M.S., University of Washington, 1959, 1961;
Ph.D., University of Minnesota, 1971.

JOSEPH BABISCH
Associate Professor of Art
B.S. in Ed., Buffalo State University, 1956;
M.S. in Ed., Westminster College, 1964;
M.A., Kent State University, 1963.

BAER, JAMES E.
Instructor in Nursing
B.S., M.S., Medical College of Georgia, 1976, 1977.

LORRAYNE Y. BAIRD
Associate Professor of English
A.B., Catawba College, 1951;
M.A., Appalachian State College, 1959;
Ph.D., University of Kentucky, 1969.

JACK D. BAKOS, JR.
Associate Professor of Civil Engineering
B.S.C.E., University of Akron, 1963;
M.S.C.E., Ph. D., West Virginia University, 1965, 1967;
P.E., Ohio, Mississippi.

PETER A. BALDINO, JR.
Associate Professor of Education
B.S., M.S., University of Bridgeport, 1955, 1956;
Ph.D., University of Illinois, 1968.

SAMUEL F. BARGER
Associate Professor of Mathematical and Computer Sciences
B.S., Clarion State College, 1958;
M.S., Ph.D., University of Minnesota, 1961, 1970.

LUBA BARNA-GULANICH
Assistant Professor of Foreign Languages and Literatures
Universitní doktorát v oborech; Ruština, Němčina, Čeština, 1957;
Russian Institut of Charles University, Prague, 1957;
Comenius University, Bratislava, 1961;
M.A., Case Western Reserve University, 1966.

EUGENE R. BARRET
Associate Professor of Health and Physical Education
A.B., Mount Union College, 1951;
M.A., Colorado Western State University, 1955.

WILLIAM O. BARSCH
Associate Professor of Engineering Technology
B.S., M.S., Ph.D., Purdue University, 1965, 1966, 1970;
P.E., Ohio.

LESTER C. BARTHOLOW
Instructor in Home Economics
B.S., Stanford University, 1963:
M.S., Bemidji State College, 1973;
M.S., Massachusetts Institute of Technology, 1974.

MARY J. BEAUBIEN
Associate Professor of Home Economics
B.S., Siena Heights College, 1955;
M.S., Michigan State University, 1962;
Ph.D., Pennsylvania State University, 1970.

JOSEPHINE T. BECKETT
Associate Professor of Education
B.S. in Ed., Youngstown State University, 1958;
M.S., in Ed., Westminster College, 1962.

PAUL E. BECKMAN, JR.
Professor of Psychology
A.B., Youngstown State University, 1950;
M.A., Ohio State University, 1952;
Ph.D., State University of Iowa, 1955.

RICHARD H. BEE
Assistant Professor of Economics
B.S. in B.A., M.A., Pennsylvania State University, 1964, 1967; D.B.A., Kent State University, 1976.

GEORGE D. BEELEN
Associate Professor of History
A.B., Youngstown State University, 1958;
M.A., Case Western Reserve University, 1962;
Ph.D., Kent State University, 1971.

PAUL X. BELLINI
Associate Professor of Civil Engineering
B.S., M.S., Ph.D.,
University of Massachusetts, 1962, 1963, 1968.

DENNIS D. BENSINGER
Associate Professor of Accounting and Finance
B.S. in B.A., Youngstown State University, 1967;
M.Acc., Ohio State University, 1968;
C.P.A., Ohio.

MARTIN E. BERGER
Associate Professor of History
B.A., Columbia University, 1964;
M.A., Ph.D., University of Pittsburgh, 1965, 1969.

MARILYN E. BILES
Assistant Professor of Mathematical and Computer Sciences
B.S., Youngstown State University, 1961;
M.S., University of Pittsburgh 1963.

WILLIAM C. BINNING
Associate Professor of Political Science
B.A., St. Anselm's College, 1966;
Ph.D., University of Notre Dame, 1970.

EDWIN V. BISHOP
Associate Professor of Physics and Astronomy
B.A., Swarthmore College, 1958;
M.S., Ph.D., Yale University, 1960, 1966.

FREDERICK J. BLUE
Professor of History
B.A., Yale University, 1958;
M.S., Ph.D., University of Wisconsin, 1962, 1966.

VIOLET F. BOGGESS
Associate Professor of Business Education and Technology
B.S. in Ed., Kent State University, 1957;
M.A., Ph.D., Ohio State University, 1961, 1970.

IVIS BOYER
Associate Professor of Political Science
B.A., Cornell College, 1942;
J.D., Youngstown State University, 1949;
M.A., Case Western Reserve University, 1958.

MARGARET A. BRADEN
Professor of Education
B.S. in Ed., Youngstown State University, 1949;
M.Ed., University of Pittsburgh, 1950;
Ph.D., University of Akron, 1971.

DONALD L. BRADY
Assistant Professor of Marketing
B.A., Athens College, 1966;
M.B.A., University of Alabama, 1971.

JOHN A. BRENNAN
Instructor in Biological Sciences
B.S., Rutgers University, 1959;
M.S., Ohio University, 1965.

ALFRED L. BRIGHT
Associate Professor of Art
B.S. in Ed., Youngstown State University, 1964;
M.A., Kent State University, 1965.

BARBARA H. BROTHERS
Associate Professor of English
B.A., Youngstown State University, 1958;
M.A., Case Western Reserve University, 1962;
Ph.D., Kent State University, 1973.

DEAN R. BROWN
Associate Professor of Mathematics
B.S., Rose Polytechnic Institute, 1960;
MS., Rensselaer Polytechnic Institute, 1964;
M.S., Ph.D., Ohio State University, 1966, 1970.

MARY A. BUDGE
Associate Professor of English
B.A., Drew University, 1962;
Ph.D., State University of New York at Buffalo, 1970.

JOHN J. BUONI
Associate Professor of Mathematical and Computer Sciences
B.S., St. Joseph's College, 1965;
M.S., Ph.D., University of Pittsburgh, 1968, 1970.

RICHARD L. BURDEN
Associate Professor of Mathematical and Computer Sciences
B.A., Albion College, 1966;
M.S., Ph.D., Case Western Reserve University, 1968, 1971.

RALPH S. BURKHOLDER
Associate Professor of Marketing
B.S., M.A., New York University, 1949, 1951.

TERRY F. BUSS
Assistant Professor of Political Science
B.S., M.A., Ph.D., Ohio State University, 1969, 1975, 1976.

CAROL L. BUTLER
Instructor in Nursing
B.S., University of Cincinnati, 1963.

DONALD W. BYO
Professor of Music
Mus.B., Youngstown State University, 1954;
M.Ed., Kent State University, 1959.

DORIS H. CANNON
Assistant Professor of Biological Sciences
R.N., Youngstown Hospital Association, 1946;
B.S. in Ed., Ohio State University, 1950;
M.A., Kent State University, 1965.

FRANK A. CASTRONOVO
Assistant Professor of Speech Communication and Theatre
B.A., Case Western Reserve University, 1965;
M.A., University of Arizona, 1970.

JOHN N. CERNICA
Professor of Civil Engineering
B.E., Youngstown State University, 1954;
M.S., Ph.D., Carnegie-Mellon University, 1955, 1957;
P.E., Ohio, Pa., N.Y., Fla.

MARVIN W. CHRISP
Professor of Education
B.A., M.A., University of Akron, 1950, 1956;
Ed.D., Case Western Reserve University, 1961.

THEODORE S. CHROBAK
Associate Professor of Engineering Technology
B.E., Youngstown State University, 1963;
M.S., West Virginia University, 1964.

CARL F. CHUEY
Assistant Professor of Biological Sciences
B.S. in Ed., Youngstown State University, 1966;
M.S., Ohio University, 1969.

PHILLIP F. CHUEY
Associate Professor of Accounting and Finance
B.S. in B.A., J.D., Youngstown State University, 1949, 1958;
M.B.A., Kent State University, 1967;
C.P.A., Ohio.

RONALD M. CIMINERO
Assistant Professor of Engineering Technology
B.E., Youngstown State University, 1965;
M.S., Ohio University, 1968.

FRANK A. CIOTOLA
Associate Professor of Mathematical and Computer Sciences
A.B., Youngstown State University, 1952;
M.A., Pennsylvania State University, 1957.

SARAH B. CLARK
Instructor in English
B.A., M.A., Ohio University, 1971, 1972.

JOHN R. CLEARY
Assistant Professor of Mathematical and Computer Sciences
B.S., Youngstown State University, 1952;
M.A., Central Michigan University, 1967.

DAVID W. CLINESS
Associate Professor of Education
A.B., M.A., University of Kentucky, 1964, 1965;
Ph.D., Ohio State University, 1973.

EDGAR M. COBETT
Professor of Education
B.S., St. Joseph's College, 1952;
M.S., Indiana University, 1957;
Ed.D., Case Western Reserve University, 1969.

WILLIAM R. COCHRAN
Associate Professor of Physics and Astronomy
B.A., M.S., Ph.D., University of California, 1962, 1964, 1969.

IRWIN COHEN
Professor of Chemistry
A.B., M.S., Ph.D., Western Reserve University, 1944, 1948, 1950.

MARGARET J. CONNELLY
Assistant Professor of Health and Physical Education
R.N., Canton Mercy Hospital, 1947;
B.S., Youngstown State University, 1955;
M.S.N., Case Western Reserve University, 1963.

JAMES A. CONSER
Instructor in Criminal Justice
A.B., Youngstown State University, 1971;
M.S., Michigan State University, 1974.

WILLIAM R. CONVERY
Assistant Professor of Education
B.A., New Mexico Western College, 1962;
M.A., Western New Mexico University, 1963;
Ed. D., University of Wyoming, 1970.

SYRETHA F. COOPER
Assistant Professor of Sociology, Anthropology and Social Work
B.A., Youngstown State University, 1952;
M.S., Case Western Reserve University, 1954.

THOMAS A. COPELAND
Assistant Professor of English
A.B., Oberlin College, 1966;
M.A., Ph.D., Northwestern University, 1967, 1971.

HOWARD B. COX
Associate Professor of Marketing
B.A., University of Rhode Island, 1959;
M.B.A., Harvard University, 1961;
Ph.D., Ohio State University, 1970.

JANIS E. CRAMER
Instructor in Home Economics
B.S. in Ed., Illinois State University, 1968;
M.S., Colorado State University, 1973.

KATHERINE H. CRITES
Assistant Professor of English
A.B., Youngstown State University, 1953;
M.A., Case Western Reserve University, 1965.

RALPH G. CRUM
Professor of Civil Engineering
B.S., M.S., Ph. D., Carnegie Institute of Technology, 1953, 1954, 1956.

LAWRENCE E. CUMMINGS
Assistant Professor of Criminal Justice
B.A., M.A., University of Texas, 1959;
Ph.D., University of Georgia, 1974.

JANE G. CUNNINGHAM
Assistant Professor of Psychology
R.N., St. Elizabeth School of Nursing, 1941;
B.S., Youngstown State University, 1960;
M.S. in Ed., Westminster College, 1963.

ARTHUR R. CURRAN
Professor of Management
B.S., Boston University, 1948;
M.B.A., Air Force Institute of Technology, 1959;
Ph.D., University of Georgia, 1970.

PAUL E. DALBEC
Professor of Physics and Astronomy
B.S., Boston College, 1957;
M.S., University of Notre Dame, 1959;
Ph.D., Georgetown University, 1966.

JAMES E. DALE
Associate Professor of Social Science
B.A., M.A., M.A., Ph.D., University of Minnesota, 1959, 1969, 1970, 1971.

JAMES H. DALY
Assistant Professor of Management
B.S. in B.A., Youngstown State University, 1970;
M.B.A., University of Akron 1972.

PRAKASH RAO DAMSHALA
Assistant Professor of Mechanical Engineering
B.E., Osmania University, 1969;
M.S., University of Miami, 1972;
Ph.E., Georgia Institute of Technology, 1977.

RAMASWAMI DANDAPANI
Assistant Professor of Mathematical and Computer Sciences
B.S., Nagpur University, 1965;
B.E., Indian Institute of Science, 1967;
M.S., Ph.D., University of Iowa, 1969, 1974.

CHARLES W. DARLING
Assistant Professor of History
B.S. in Ed., Youngstown State University, 1953;
M.A., Ohio University, 1956.

ANTHONY F. DASTOLI
Assistant Professor of Management
B.E., Youngstown State University, 1958;
M.B.A., University of Pittsburgh, 1964.

LAWRENCE A. DAVIS
Assistant Professor of Marketing
B.S. in B.A., Youngstown State University, 1965;
M.B.A., Kent State University, 1967.

MYRTLE DAVIS
Instructor in Nursing
R.N., St. Elizabeth's Hospital, 1952;
B.S., Youngstown State University, 1957;
M.Ed., Kent State University, 1971.

GILDA M. DeCAPITA
Associate Professor of Nursing
R.N., Youngstown Hospital Association, 1941;
B.S., Youngstown State University, 1949;
M.S.N.Ed., Case Western Reserve University, 1955.

JAMES W. DeGARMO, JR.
Associate Professor of Criminal Justice
B.S. in B.A., University of Pittsburgh, 1943;
J.D., Cleveland-Marshall Law School, 1969.

EDWIN T. DEIDERICK
Associate Professor of Marketing
B.S. in B.A., Youngstown State University, 1963;
M.S., New York University, 1964.

JANET E. DEL BENE
Professor of Chemistry
B.S. in Ed., A.B., Youngstown State University, 1963, 1965;
Ph.D., University of Cincinnati, 1968.

THEODOSIUS L. DEMEN
Associate Professor of Mathematical and Computer Sciences
University of Innsbruck, 1951;
M.S., Marquette University, 1954;
Ph.D., St. Louis University, 1958.

JACK H. DEVLETIAN
Associate Professor of Chemical Engineering and Materials Science
B.S., University of Massachusetts, 1963;
M.S., Ph.D., University of Wisconsin, 1966, 1972.

DANIEL B. DI EDWARDO
Instructor in Health and Physical Education
B.S., M.S., Southern Connecticut State College, 1970, 1973.

JOAN F. DiGIULIO
Assistant Professor of Sociology, Anthropology and Social Work
A.B., College of St. Francis, 1959;
M.A., University of Chicago, 1962.

ROBERT A. DiGIULIO
Professor of Education
B.S., Lewis College, 1957;
M.S., Northern Illinois University, 1962;
Ph.D., Purdue University, 1969.

THADDEUS M. DILLON
Professor of Mathematical and Computer Sciences
B.S., M.S., John Carroll University, 1950, 1952;
Ph.D., University of Pittsburgh, 1963.

LAWRENCE A. DiRUSSO
Professor of Education
A.B., Youngstown State University, 1954;
M.A., Kent State University, 1960;
Ed.D., Case Western Reserve University, 1966.

FRANK A. D'ISA
Professor of Mechanical Engineering
B.S., Youngstown State University, 1943;
M.S. in M.E., Carnegie-Mellon University, 1947;
Ph.D., University of Pittsburgh, 1960;
P.E., Ohio.

THOMAS N. DOBBLESTEIN
Associate Professor of Chemistry
B.S., Eastern Michigan University, 1964;
M.S., Ph.D., Iowa State University, 1966, 1967.

GUIDO A. DOBBERT
Professor of Sociology, Anthropology and Social Work
A.M., Ph.D., University of Chicago, 1957, 1965.

MARY ANN P. DOBRICH
Assistant Professor of Psychology
A.B., Youngstown State University, 1946;
M.Ed., University of Pittsburgh, 1953.

LESLIE S. DOMONKOS
Professor of History
B.A., Youngstown State University, 1959;
M.A., M.M.S., D.S.M., Mediaeval Institute, University of Notre Dame, 1960, 1963, 1966.

JAMES E. DOUGLASS
Professor of Education
B.E., Youngstown State University, 1960;
M.S., Westminster College, 1965;
Ed.D., University of Akron, 1970.

WADE C. DRISCOLL
Associate Professor of Industrial Engineering
B.S., Pennsylvania State University, 1963;
M.S., New York University, 1965;
Ph.D., Case Western Reserve University, 1975.

CAROL M. DUCEY
Circulation Librarian with the Rank of Instructor
B.A., Barnard College, 1951;
M.L.S., University of Rhode Island, 1968.

JACK D. DUNSING
Associate Professor of Education
B.S., M.S., Ph.D., University of Pittsburgh, 1954, 1957, 1959.

HUGH G. EARNHART
Associate Professor of History
A.B., Bowling Green State University, 1960;
M.A., University of Maryland, 1963.

EARL E. EDGAR
Professor of Philosophy and Religious Studies
B.A., DePauw University, 1935;
M.A., University of Nebraska, 1937;
Ph.D., University of Cincinnati, 1940.

C. WILLIAM EICHENBERGER
Associate Professor of Social Science
A.B., Youngstown State University, 1957;
M.S. in Ed., Westminster College, 1963;
Ph.D., University of Pittsburgh, 1974.

R. DONALD ELSER
Associate Professor of Speech Communication and Theatre
A.B., Youngstown State University, 1935;
M.Litt., University of Pittsburgh, 1939.

EARL E. EMINHIZER
Associate Professor of Philosophy and Religious Studies
B.A., Furman University, 1948;
B.S. in Ed., Youngstown State University, 1951;
B.D., Th.M., Crozer Theological Seminary, 1955, 1956;
Th.D., California School of Theology at Claremont, 1965.

BARBARA G. ENGELHARDT
Assistant Professor of Nursing
B.S., Muskingum College, 1951;
M.N., Western Reserve University, 1952.

BARBARA A. ERICKSON
Assistant Professor of Nursing
B.S., St. John College of Cleveland, 1962;
M.S., Catholic University of American School of Nursing, 1971.

WINSTON H. ESHLEMAN
Associate Professor of Education
B.A., M.A., Stanford University, 1948, 1953;
Ed.D., University of Arizona, 1967.

LARRY E. ESTERLY
Associate Professor of Political Science
A.B., Youngstown State University, 1961;
M.A., Johns Hopkins University, 1963.

ERWIN M. EVANS
Associate Professor of Accounting and Finance
B.S. in B.A., Youngstown State University, 1953;
M.B.A., Case Western Reserve University, 1960.

FRANK C. EVANS
Instructor in Accounting and Finance
B.A., M.B.A., University of Pittsburgh, 1972, 1973.

JOHN D. FAIRES
Associate Professor of Mathematical and Computer Sciences
B.S., Youngstown State University, 1963;
M.S., Ph.D., University of South Carolina, 1965, 1970.

DANIEL A. FANTAUZZI
Instructor in Art
B.F.A., Rochester Institute of Technology, 1969;
M.A., State University of New York at Albany, 1971.

FRED C. FEITLER
Assistant Professor of Education
B.A., Earlham College, 1962;
M.Ed., University of Pittsburgh, 1964;
M.S., Ph.D., Syracuse University, 1967, 1970.

KATHRYN L. FELD
Instructor in Allied Health
B.S., Youngstown State University, 1971;
M.S., Westminster College, 1975.

ILAJEAN FELDMILLER
Professor of Home Economics
B.S., Pennsylvania State University, 1945;
M.S., Ph.D., Ohio State University, 1952, 1970.

DALE W. FISHBECK
Associate Professor of Biological Sciences
B.A., Yankton College, 1957;
M.A., University of South Dakota, 1959;
Ph.D., University of Minnesota, 1968.

MASON L. FISHER
Assistant Professor of Physics and Astronomy
B.S., Lafayette College, 1957;
M.S., Lehigh University, 1959.

WILLIAM S. FLAD
Associate Professor of Advertising and Public Relations
A.B., Lafayette College. 1935;
M.B.A., Harvard Graduate School of Business Administration, 1937.

ROBERT E. FLEMING
Associate Professor of Music
A.B., M.A., Marshall University, 1953, 1956.

ELMER FOLDVARY
Professor of Chemistry
B.S., Youngstown State University, 1958;
M.S., Ph.D., Texas A&M University, 1961, 1964.

GRAHAM W. FOSTER
Assistant Professor of Health and Physical Education
B.S., M.S., Springfield College, 1959, 1971.

ROBERT H. FOULKES, JR.
Associate Professor of Electrical Engineering
B.S., Case Western Reserve University, 1966;
M.S., University of Southern California, 1968;
Ph.D., Case Western Reserve University, 1970.

SAUL S. FRIEDMAN
Associate Professor of History
B.A., Kent State University, 1959;
M.A., Ph.D., Ohio State University, 1962, 1969.

GARY F. FRY
Associate Professor of Sociology, Anthropology and Social Work
B.A., University of Denver, 1965;
M.A., Ph.D., University of Utah, 1968, 1970.

DARLA FUNK
Assistant Professor of Music
B.A., M.A., University of Northern Colorado, 1967, 1975.

STEVEN R. GARDNER
Associate Professor of Engineering Technology
B.E.E., M.S., Ph.D., Ohio State University, 1965, 1966, 1970.

BEVERLY P. GARTLAND
Assistant Professor of Sociology, Anthropology and Social Work
A.B., Youngstown State University, 1964;
M.A., Ohio State University, 1967.

CAROL GAY
Associate Professor of English
A.B., Youngstown College, 1954;
M.A., Ohio State University, 1957;
Ph.D., Kent State University, 1972.

THOMAS GAY
Associate Professor of English
A.B., Youngstown College, 1953;
M.A., Western Reserve University, 1954.

CHARLES G. GEBELEIN
Professor of Chemistry
B.A., M.A., Ph.D., Temple University, 1955, 1959, 1967.

MICHAEL D. GELFAND
Assistant Professor of Music
B.M., Indiana University, 1971;
M.M., Cleveland Institute of Music, 1974.

MARGARET T. GITTIS
Assistant Professor of Psychology
B.S., St. Lawrence University, 1969;
M.A., Ph.D., Ohio State University, 1973, 1975.

EMILY K. GOLDSTEIN
Assistant Professor of Mathematical and Computer Sciences
B.S., New York University, 1931;
M.A., Columbia University, 1936.

ADORACION F. GONZALEZ
Assistant Professor of Social Science
A.B., Adamson University, 1952;
M.A., Michigan State University, 1958.

RONALD L. GOULD
Professor of Music
B.M., North Central College, 1954;
S.M.M., S.M.D., Union Theological Seminary, 1956, 1970.

STEPHEN A. GRAF
Associate Professor of Psychology
A.B., Miami University, 1965;
M.A., Ph.D., Ohio State University, 1968, 1971.

MARTIN A. GREENMAN
Professor of Philosophy and Religious Studies
B.A., Ph.D., University of Chicago, 1942, 1950.

JOHN L. GRIM
Associate Professor of Accounting and Finance
A.B., Youngstown State University, 1947;
M.B.A., Kent State University, 1966.

INEZ G. GROSS
Instructor in Accounting and Finance
B.A., Syracuse University, 1968;
M.B.A., Youngstown State University, 1976.

MARIE F. GUBSER
Assistant Professor of English
B.S. in Ed., Kent State University, 1931;
M.Ed., Westminster College, 1969.

MARY G. GUTERBA
Assistant Professor of Psychology
A.B., Youngstown State University, 1960;
M.S. in Ed., Westminster College, 1963.

MADELEINE B. HAGGERTY
Assistant Professor of Allied Health
A.A.S., Lakeland Community College, 1975;
B.S. in Ed., Youngstown State University, 1961;
M.S. in Ed., Northeastern University, 1966.

PHILIP J. HAHN
Professor of Economics
B.S., Juniata College, 1938;
M.B.A., Harvard University, 1940;
Ph.D., Case Western Reserve University, 1965.

LAWRENCE J. HAIMS
Associate Professor of Education
B.A., University of Michigan, 1956;
M.Ed., Ph.D., University of Pittsburgh, 1970, 1972.

AILI J. HAKOJARVI
Associate Professor of Home Economics
B.S., Ohio State University, 1941;
M.S., Case Western Reserve University, 1950;
Ed.D., Columbia University, 1969.

WILBERT M. HAMMACK
Associate Professor of Education
B.S. in Ed., Kent State University, 1939;
M.Ed., University of Pittsburgh, 1950;
Ed.D., University of Akron, 1971.

CLYDE T. HANKEY
Professor of English
B.A., M.A., University of Pittsburgh, 1949, 1950;
M.A., Ph.D., University of Michigan, 1954, 1960.

STEPHEN HANZELY
Associate Professor of Physics and Astronomy
B.S., Kent State University, 1962;
M.S., Toledo University, 1964;
Ph.D., New Mexico State University, 1969.

MARY V. HARE
Professor of English
A.B., Mount Holyoke College, 1940;
M.A., Ph.D., University of Virginia, 1951, 1960.

NANCY E. HARIG
Instructor in Nursing
B.S.N., Case Western Reserve University, 1960.

ANN G. HARRIS
Associate Professor of Geology
B.S., Kent State University, 1956;
M.S., Miami University, 1958.

C. EARL HARRIS, JR.
Associate Professor of Geology
B.S., Kent State University, 1957;
M.S., Miami University, 1958.

LARRY F. HARRIS
Assistant Professor of Music
B.M.E., M.M., Drake University, 1967, 1968.

LOUIS N. HARRIS
Instructor in Allied Health
A.S., Community College of Allegheny County, 1973.

JEAN HASSELL
Instructor in Home Economics
B.S. Syracuse University, 1951;
M.S. Kent State University, 1974.

GEORGE D. HAUSHALTER
Assistant Professor of Social Science
B.S., Indiana University of Pennsylvania, 1959;
M.Ed., University of Pittsburgh, 1965.

GAIL E. HEDRICK
Instructor in Nursing
B.S., Ohio State University, 1956;
M.S., University of Pittsburgh, 1971.

MARTIN HELLING
Assistant Professor of Mathematical and Computer Sciences
B.S., Ohio State University, 1956;
M.S., University of Chicago, 1958;
Ph.D., University of California at Berkeley, 1966.

JAMES T. HENKE
Associate Professor of English
B.A., Washington University, 1964;
M.A., University of Missouri, 1966;
Ph.D., University of Washington, 1970.

DOROTHY F. HEYM
Assistant Professor of Education
B.S. in Ed., Youngstown State University, 1942;
M.S. in Ed., Westminster College, 1965.

LOUIS E. HILL
Professor of Education
B.S., State University of New York at Oswego, 1950;
M.S., Ed.D., Syracuse University, 1953, 1969.

DOROTHY M. HILLE
Assistant Professor of Business Education and Technology
B.S. in B.A., Marquette University, 1937;
M.B.A., Kent State University, 1971.

M. DEAN HOOPS
Associate Professor of Education
B.S.E., Kent State University, 1959;
M.S., Ph.D., University of Michigan, 1961, 1969.

LOIS M. HOPKINS
Associate Professor of Music
B.M., Morningside College, 1948;
M.M., Eastman School of Music of the University of Rochester, 1949.

ROBERT E. HOPKINS
Professor of Music
B.M., M.M., D.M.A., Eastman School of Music of the University of Rochester, 1953, 1954, 1959.

MARGARET M. HORVATH
Assistant Professor of Home Economics
B.S. in Ed., M.A., Kent State University, 1952, 1971.

SALLY M. HOTCHKISS
Associate Professor of Psychology
A.B., Randolph-Macon College, 1949;
M.A., Ph.D., University of Minnesota, 1950, 1959.

SANFORD N. HOTCHKISS
Professor of Psychology
B.A., M.A., Ph.D., University of Minnesota, 1949, 1950, 1959.

JAMES A. HOUCK
Associate Professor of English
B.A., St. John's College, 1964;
Ph.D., Duquesne University, 1971.

MICHAEL K. HOUSEHOLDER
Professor of Civil Engineering
B.S. in C.E., Valparaiso University, 1963;
M.S. in C.E., Ph.D., Purdue University
1965, 1969;
P.E., Indiana, Ohio.

DONALD E. HOVEY
Professor of Management
B.A., University of California at
Los Angeles, 1950;
M.A., Ph.D., University of Colorado,
1958, 1962.

CARROL J. HOWARD
Assistant Professor of Military Science
B.S., U.S. Military Academy, 1967.

PEI HUANG
Professor of History
B.A., M.A., National Taiwan University,
China, 1956, 1959;
Ph.D., Indiana University, 1963.

ROSEMARY HUBLER
Instructor in Economics
B.A., M.A., Youngstown State
University, 1972, 1974.

MARY M. HUDAK
Instructor in Business Education and Technology
B.A., M.S., Youngstown State University,
1972, 1976.

JOHN M. HUDZIK
Instructor in Social Science
B.A., Youngstown State University, 1952;
M.Ed., Westminster College, 1964.

BILL G. HULSOPPLE
Professor of Speech Communication
and Theatre
B.S. in Ed., University of Dayton, 1950;
M.A., University of Denver, 1954;
Ph.D., Ohio State University, 1958.

RAYMOND W. HURD
Associate Professor of Mathematical and
Computer Sciences
B.S. in Ed., M.Ed., Ohio University, 1951,
1957;
Ph.D., Ohio State University, 1967.

WILLIAM D. JENKINS, JR.
Associate Professor of History
B.S., Loyola College, 1963;
M.A., Ph.D., Case Western Reserve
University, 1964, 1969.

RICHARD W. JONES
Associate Professor of Chemical Engineering
and Materials Science
B.S., University of Missouri, 1959;
M.S., Rensselaer Polytechnic Institute, 1963;
Ph.D., Northwestern University, 1968.

ELAINE S. JUHASZ
Associate Professor of Art
B.S. in Ed., Youngstown State University,
1960;
M.Ed., Kent State University, 1965.

VERN L. KAGARICE
Associate Professor of Music
B.M., Bethany College, 1964;
M.M., D.M., Indiana University, 1966, 1973.

JAMES G. KARAS
Associate Professor of Biological Sciences
B.S., University of Illinois, 1956;
M.S., Ph.D., Michigan State University,
1958, 1962.

ASSAD S. KASSEES
Assistant Professor of Sociology,
Anthropology and Social Work.
B.A., University of Delaware, 1962;
M.S.W., University of North Carolina, 1965;
Ph.D., Florida State University, 1970.

LOUIS E. KATZ
Assistant Professor of Management
B.A., Kent State University, 1971;
J.D., Cleveland State University, 1974;
B.S., Illinois State University, 1977.

JOHN L. KEARNS
Associate Professor of Industrial Engineering
B.A., University of Toronto, 1945;
Ph.D., Iowa State University, 1954.

GEORGE W. KELLEY, JR.
Professor of Biological Sciences
A.S., Lamar Junior College, 1942;
B.S., University of Nebraska, 1947;
M.S., University of Kentucky, 1951;
Ph.D., University of Nebraska, 1953.

JEAN M. KELTY
Professor of English
A.B., Youngstown University, 1958;
M.A., Western Reserve University, 1959;
Ph.D., Case Western Reserve University,
1969.

DOROTHY M. KENNEDY
Assistant Professor of Nursing
Diploma, Sharon General Hospital, 1952;
B.S., Duquesne University, 1957;
M.S., Westminster College, 1961.

TAGHI T. KERMANI
Professor of Economics
Licenciate in Law, University of Tehran, 1949; M.A., Ph.D., University of Nebraska, 1953, 1959.

WAYNE G. KERNS
Assistant Professor of Criminal Justice
B.S. in Ed., M.A., Ph.D., Ohio State University, 1964, 1968, 1973.

JANE KESTNER
Instructor of Psychology
B.S., Ball State University, 1973; M.A., Ph.D., University of Notre Dame, 1975, 1978.

IRFAN AHMAD KHAN
Assistant Professor of Civil Engineering
B.Sc., University of Engineering and Technology, 1967; M.S., University of Hawaii, 1974; Ph.D., Colorado State University, 1977.

IKRAM U. KHAWAJA
Associate Professor of Geology
B.S., M.S., University of Karachi, 1962, 1963; M.S., Southern Illinois University, 1968; Ph.D., Indiana University, 1969.

JAMES W. KIRIAZIS
Professor of Sociology, Anthropology and Social Work
A.B., Youngstown State University, 1951; M.S.W., Louisiana State University, 1953; Ph.D., University of Pittsburgh, 1967.

JOSEPH KIRSCHNER
Associate Professor of Education
BS., M.A.T., Tulane University, 1953, 1960; Ed.D., Rutgers, The State University, 1965.

MICHAEL KLASOVSKY
Professor of Geography
B.S. in Ed., Bowling Green State University, 1948; M.A., Ohio State University, 1950.

ALBERT J. KLEIN
Associate Professor of Mathematical and Computer Sciences
B.S., M.S., Ph.D., Ohio State University, 1966, 1967, 1969.

JANET S. KNAPP
Assistant Professor of English
B.S. in Ed., Miami University, 1958; M.A., University of Kansas, 1966; A.M., University of Michigan, 1972.

LELAND W. KNAUF
Associate Professor of Mathematical and Computer Sciences
B.S. in Ed., M.Ed., Kent State University, 1956, 1957.

MARILYN A. KOCINSKI
Associate Professor of Health and Physical Education
B.S. in Ed., M.Ed., Kent State University, 1958, 1963.

MERVIN KOHN
Professor of Management
A.B., University of Missouri, 1937; M.S. in C., Ph.D., St. Louis University, 1953, 1957.

FRIEDRICH W. KOKNAT
Associate Professor of Chemistry
Diplom-Chemiker-Vorprufung, Diplom-Chemiker, Doktor der Naturwissenschaften, University of Giessen, Germany, 1959, 1963, 1965.

JOSEPH J. KOSS
Associate Professor of Economics
B.S., M.A., University of Pittsburgh, 1948, 1951; M.S. in Ed., Youngstown State University, 1978.

KATHLEEN M. KOUGL
Assistant Professor of Speech Communication and Theatre
B.S. in Ed., Northwestern University, 1967; M.A., Ph.D., Pennsylvania State University, 1972, 1975.

STEPHEN L. KOZARICH
Associate Professor of Mathematical and Computer Sciences
B.S., Youngstown State University, 1964; M.S., Michigan State University, 1966; Ph.D., Colorado State University, 1971.

RAYMOND E. KRAMER
Associate Professor of Electrical Engineering
B.S., Heidelberg College, 1943; M.S. in E.E., Case Western Reserve University, 1950; P.E., Ohio.

RICHARD D. KREUTZER
Associate Professor of Biological Sciences
B.S., M.S., Ph.D., University of Illinois, 1963, 1965, 1968.

AHALYA KRISHNAN
Assistant Professor of Psychology
B.A., Madras University, Madras, India, 1955; M.S., University of Wisconsin-Platteville, 1969; Ph.D., Kent State University, 1975.

RAMA KRISHNAN
Professor of Management
B.A., Panjab University, 1958; B.S. in B.A., M.B.A., Ph.D., The American University, 1964, 1965, 1967.

GEORGE P. KULCHYCKY
Associate Professor of History
B.S., Kent State University, 1964;
M.A., John Carroll University, 1965;
Ph.D., Georgetown University, 1970.

BERTINA A. LABORDE
Associate Professor of Health and Physical Education
B.S. in Ed., M.S., Ohio University, 1948, 1949.

ROBERT P. LACICH
Assistant Professor of Accounting and Finance
B.S. in Ed., Slippery Rock State College, 1952;
M.B.A., University of Pittsburgh, 1960.

LEON LAITMAN
Associate Professor of Geography
B.S., Brooklyn College, 1936;
Certificate Et. Politiques, University of Grenoble, 1949;
Docteur de l'Universite, University of Paris, France, 1953.

VIRGIL R. LANG
Associate Professor of Advertising and Public Relations
B.S., John Carroll University, 1950;
M.A., Western Reserve University, 1963;
Ph.D., St. John's University, New York, 1968.

JOSEPH E. LAPINSKI
Associate Professor of Music
Mus.B., Youngstown State University, 1965;
M.M., Michigan State University, 1967.

EDWARD J. LARGENT, JR.
Associate Professor of Music
B.S., B.M., Ohio State University, 1960, 1963;
M.M., University of Illinois, 1964;
Ph.D., Ohio State University, 1972.

ABDUL B. LATEEF
Associate Professor of Criminal Justice
B.S., M.S., Punjab University, 1959, 1962;
Ph.D., University of Newcastle, England, 1966.

GLORIANNE M. LECK
Associate Professor of Education
B.S., M.S., Ph.D., University of Wisconsin, 1963, 1966, 1968.

JAMES J. LEPORE
Associate Professor of Art
B.S., Youngstown State University, 1953;
M.S., Illinois Institute of Technology, 1954;
M.F.A., Arizona State University, 1971.

GEORGE E. LETCHWORTH
Assistant Professor of Psychology
A.B., Bucknell University, 1956;
M.A., Ph.D., University of Pennsylvania, 1958, 1963.

KAI C. LEUNG
Assistant Cataloger with the Rank of Instructor
B.A., Hong Kong Baptist College, 1962;
M.L.S., University of California at Berkeley, 1969.

GEORGE LEVITSKY
Assistant Professor of Education
A.B., M.S. in Ed., Youngstown State University, 1954, 1973.

PAUL E. LIBER
Assistant Professor of Marketing
B.S. in B.A., Ohio State University, 1940;
M.B.A., Kent State University, 1962.

RENEE D. LINKHORN
Associate Professor of Foreign Languages and Literatures
Diplome de Licenciee, University of Liege, Belgium, 1946;
M.A., University of Connecticut, 1960;
Docteur en Philosophie et Lettres, University of Liege, Belgium, 1972.

LORETTA M. LIPTAK
Associate Professor of Health and Physical Education
B.S. in Ed., Youngstown State University, 1957;
M.A., Ohio State University, 1965.

YIH-WU LIU
Associate Professor of Economics
B.A., National Taiwan University, 1957;
M.B.A., City College of New York, 1963;
M.S., Carnegie Mellon University, 1977;
Ph.D., Southern Illinois University, 1968.

CYNTHIA M. LOEHR
Assistant Professor of Health and Physical Education
B.S., Northeastern State University, 1964;
M.S., Oklahoma State University, 1969.

DAVID H. LONGACRE
Professor of Military Science
B.S., University of Akron, 1955;
M.A., University of Detroit, 1963.

JOSEPH C. LONG
Associate Professor of Management
B.S., Thiel College, 1950;
M.Litt., University of Pittsburgh, 1952.

GORDON E. LONGMUIR
Associate Professor of Health and Physical Education
B.S. in Ed., M.S., University of North Dakota, 1966, 1967;
Ed.D., University of New Mexico, 1972.

MARY B. LOUD
Associate Professor of Foreign Languages and Literatures
B.A., University of Wisconsin, 1964;
M.A., University of North Carolina, 1967;
Ph.D., University of Kentucky, 1970.

CHARLES M. LOVAS
Associate Professor of Mechanical Engineering
B.S.M.E., University of Akron, 1961;
M.S.M.E., Ph.D., University of Notre Dame, 1963, 1968.

JAMES G. LUCAS
Associate Professor of Art
A.B., Youngstown State University, 1961;
M.A., Kent State University, 1963.

JOSEPH R. LUCAS
Professor of Philosophy and Religious Studies
A.B., University of Scranton, 1938;
M.A., S.T.B., S.T.L. University of Ottawa, 1945, 1943, 1945;
M.A., Kent State University, 1950;
J.D., Youngstown State University, 1957;
J.C.B., J.C.L. J.C.D., Lateran University, Rome, 1959, 1959, 1962;
S.T.D., Angelicum University of Rome, 1952;
Ph.D., University of Ottawa, 1951.

MARVIN LUKIN
Associate Professor of Chemistry
B.S., Ohio University, 1949;
M.S., Ph.D., Case Western Reserve University, 1954, 1956.

EMILY P. MACKALL
Professor of Economics
B.A., Westminster College, 1934;
M.A., Northwestern University, 1935.

DAVID MacLEAN
Associate Professor of Biological Sciences
B.S., Heidelberg College, 1963;
M.S., Ph.D., Purdue University, 1965, 1969.

RUSSELL A. MADDICK
Associate Professor of Art
B.A., Youngstown State University, 1964;
M.F.A., Ohio State University, 1966.

RICHARD M. MAGNER
Associate Professor of Accounting and Finance
B.S., Indiana University of Pennsylvania, 1952;
MS. in Ed., Westminster College; 1957;
C.P.A., Pennsylvania.

INALLY MAHADEVIAH
Professor of Chemistry
B.S., M.S., University of Mysore, 1950, 1954;
Ph.D., University of Cincinnati, 1963.

MELVIN MAMULA
Associate Professor of Advertising and Public Relations
B.S. in B.A., Youngstown State University, 1951;
M.Litt., University of Pittsburgh, 1952.

JOHN V. MANTON
Associate Professor of Geography
B.A., M.A., M.A., University of Michigan, 1953, 1954, 1956.;
M.A., Kent State University, 1976.

ANTHONY M. MARAVOLA
Assistant Professor of Military Science
B.A., Youngstown State University, 1969;
M.A., Kent State University, 1976.

INEKE HAEN MARSHALL
Assistant Professor of Criminal Justice
A.S., Katholieke Edonomische Hogeschool Tilburg, 1972;
MA., College of William and Mary, 1974;
Ph.D., Bowling Green State University, 1977.

CAROLYN C. MARTINDALE
Instructor in English
B.A., Kent State University, 1960.

MARK A. MASAKI
Associate Professor of Psychology
A.B., University of California at Los Angeles, 1966;
M.A., California State College at Long Beach, 1969;
Ph.D., Southern Illinois University, 1971.

JOHN B. MASON
Assistant Professor of English
B.A., University of North Colorado, 1968;
M.A., D.A., Ph.D., University of Oregon, 1969, 1975, 1976.

DONALD H. MATHEWS, JR.
Associate Professor of Marketing
B.B.A., Baylor University, 1958;
M.B.A., Southern Methodist University, 1960;
Ph.D., Union Graduate School, 1972.

GARY P. MAUL
Assistant Professor of Industrial Engineering
M.S.I.E., Purdue University, 1976.

GUS MAVRIGIAN
Professor of Mathematical and Computer Sciences
B.S., M.S., Carnegie Institute of Techology, 1950, 1954;
M.S. in C.E., Carnegie-Mellon University, 1970;
Ph.D., University of Akron, 1975.

JOSEPH T. MAY
Associate Professor of History
A.B., Wheaton College, 1957;
M.A., Ph.D., Kent State University, 1966, 1969.

WALTER S. MAYHALL
Assistant Professor of Music
B.M., Cleveland Institute of Music, 1967.

E. DARLENE McCARDEL
Associate Professor of Accounting and Finance
B.S., M.S., University of Akron, 1964, 1968.

PATRICIA A. McCARTHY
Instructor in Nursing
B.S., Mercy College of Detroit, 1964;
M.S., Wayne State University, 1966.

H. THOMAS McCRACKEN
Professor of English
B.S., M.S., State University of New York, 1958, 1962;
M.A., Middlebury College, 1965;
Ph.D., University of Illinois, 1971.

KEITH McKEAN
Instructor in Social Science
Ph.B., University of North Dakota, 1956;
Diploma, St. Vladimir's Orthodox Theological Seminary, 1959;
M.A., Fordham University, 1964;
M.A., Case Western Reserve University, 1973.

DONALD E. McLENNAN
Professor of Physics and Astronomy
B.A., University of Western Ontario, 1941;
M.A., Ph.D., University of Toronto, 1948, 1950.

JAGDISH C. MEHRA
Associate Professor of Economics
B.A., M.A., Rasjasthan University, 1955, 1957;
Ph.D., State University of New York at Buffalo, 1969.

HOWARD D. METTEE
Associate Professor of Chemistry
B.A., Middlebury College, 1961;
Ph.D., University of Calgary, 1964.

ELIZABETH METZGER
Assistant Professor of English
B.A., Jersey City State College, 1970;
Ph.D., State University of New York, 1977.

MARGARITA W. METZGER
Associate Professor of Foreign Languages and Literatures
B.A., M.A., University of Mississippi, 1941, 1942;
Licenciada en Letras, Universidad de San Carlos, 1949.

ROBERT L. MILLER
Professor of Accounting and Finance
B.S. in B.A., M.B.A., Ohio State University, 1941, 1950.

DONALD J. MILLEY
Associate Professor of Economics
B.A., Ph.D., State University of New York at Buffalo, 1966, 1974.

HELEN M. MINES
Instructor in Health and Physical Education
B.S., Bowling Green State University, 1965;
M.A., Central Michigan University, 1970.

DARYL W. MINCEY
Instructor in Chemistry
B.S., M.S., Ph.E., University of Cincinnati, 1972, 1974, 1977.

BRENDAN P. MINOGUE
Assistant Professor of Philosophy and Religious Studies
B.A., Cathedral College, 1967;
M.A., Ph.D., Ohio State University, 1970, 1974.

RICHARD C. MITCHELL
Associate Professor of Art
B.F.A., Illinois Wesleyan University, 1962;
M.F.A., Ohio University, 1964.

EDWARD MOONEY, JR.
Associate Professor of Physics and Astronomy
B.S., Youngstown State University, 1964;
M.S., Cornell University, 1966;
Ph.D., Virginia Polytechnic Institute, 1971.

MARGARET C. MOORE
Assistant Professor of Sociology, Anthropology and Social Work
B.S., Ohio State University, 1941;
M.A., Kent State University, 1964.

WILLIAM D. MOOREHEAD, JR.
Associate Professor of Physics and Astronomy
B.A., Ohio Wesleyan University, 1958;
Ph.D., Ohio State University, 1968.

CLYDE D. MORRIS
Assistant Professor of Economics
B.A., Ohio State University, 1964;
M.A., Michigan State University, 1966.

FLOYD E. MORRIS
Associate Professor of Mechanical Engineering
B.S., Stanford University, 1960;
M.S., University of Washington, 1965;
Ph.D., Iowa State University, 1971.

JAMES C. MORRISON
Associate Professor of Psychology
B.A., University of Oregon, 1961;
M.A., University of Tennessee, 1964;
Ph.D., Michigan State University, 1970.

NICHOLAS T. MORTELLARO
Assistant Professor of Mathematical and Computer Sciences
B.S., Youngstown State University, 1964;
M.S., Rensselaer Polytechnic Institute, 1968.

MICHAEL T. MOSELEY
Instructor in Art
B.S., M.S., Texas Tech University, 1973, 1974.

LOYAL B. MOULD
Assistant Professor of Music
B.S., Youngstown State University, 1951;
M.A., Kent State University, 1967.

PHILIP C. MUNRO
Assistant Professor of Electrical Engineering
B.S.E.E., M.S., Washington University, 1960, 1964;
Ph.D., Purdue University, 1973.

ALEXANDER J. MUNTEAN
Associate Professor of Sociology, Anthropology and Social Work
B.A., Youngstown State University, 1952;
M.A., Ph.D., Michigan State University, 1959, 1970.

GRATIA H. MURPHY
Associate Professor of English
A.B., Bucknell University, 1947;
M.A., Ohio State University, 1951.
Ph.D., Kent State University, 1976.

OLIVER MUSUKA
Instructor in History
B.A., Morningstar College, 1964;
M.A., Northwestern University, 1965.

JON M. NABEREZNY
Professor of Art
B.S. in Ed., Youngstown State University, 1949;
M.A., State University of Iowa, 1952.

VICTOR T. NASH
Instructor in English
B.A., M.A., Ph.D., University of Oregon, 1967, 1976, 1977.

JOHN NEVILLE, JR.
Instructor in Health and Physical Education
B.S., M.Ed., Kent State University, 1972, 1975.

WILLIAM J. NICHOLS
Associate Professor of Education
Th.B., Olivet Nazarene College, 1954;
M.S. in Ed., Indiana University, 1963;
Ed.D., Ball State University, 1968.

ROBERT T. NICKELSBURG
Associate Professor of Education
B.A., Valparaiso University, 1957;
M.A., M.S., University of Denver, 1961, 1965;
Ed.D., University of Northern California, 1970.

ESTHER P. NIEMI
Professor of Economics
B.S. in B.A., Youngstown State University, 1956;
M.A., Ph.D., Case Western Reserve University, 1958, 1969.

DANIEL J. O'NEILL
Associate Professor of Speech Communication and Theatre
B.A., Wayne State University, 1961;
M.A., Bowling Green State University, 1962;
Ph.D., Michigan State University, 1969.

WENDELL E. ORR
Associate Professor of Music
B.S., B.M., Lawrence College, 1952, 1955;
M.M., University of Michigan, 1957.

ALFRED W. OWENS
Instructor in Speech Communication and Theatre
B.A., Baldwin-Wallace College, 1969;
M.A., Kent State University, 1971.

AUDREY R. OWENS
Instructor in Nursing
R.N., Youngstown Hospital Association, 1945;
B.S. in Ed., Youngstown State University, 1971.

NICHOLAS PARASKA
Professor of Civil Engineering
B.S., U.S. Military Academy, 1939;
M.S., A&M College of Texas, 1947;
Ph.D., Carnegie Institute of Technology, 1967.

JOSEPH PARLINK
Assistant Professor of Music
Mus. B., Youngstown State University, 1958.

PIETRO J. PASCALE
Associate Professor of Education
B.A., M.A., Seton Hall University, 1960, 1964;
Ed.D., Rutgers University, 1971.

EDWIN R. PEJACK
Professor of Mechanical Engineering
B.M.E., M.S., Rensselaer Polytechnic Institute, 1961, 1962;
Ph.D., Ohio State University, 1967;
P.E., Ohio, Pa.

ESOTTO PELLEGRINI
Associate Professor of Music
B.M., Youngstown State University, 1951;
M.A., Kent State University, 1965.

PAUL C. PETERSON
Professor of Biological Sciences
B.S., Gustavus Adolphus College, 1962;
Ph.D., University of Nebraska, 1968.

JOHN E. PETREK
Associate Professor of Mechanical Engineering
B.S., Oregon State University, 1945;
M.S. in E., University of Akron, 1962;
P.E., Ohio.

WILLIAM PETRYCH
Associate Professor of Accounting and Finance
B.S., M.A., Ohio State University, 1954, 1957.

JOAN A. PHILIPP
Professor of Health and Physical Education
B.S., Western Michigan University, 1952;
M. of P.E., MacMurray College, 1953;
Ph.D., University of Michigan, 1967.

RICHARD C. PHILLIPS
Associate Professor of Chemistry
B.A., Oklahoma State University, 1959;
Ph.D., University of Texas, 1966.

VIRGINIA B. PHILLIPS
Assistant Professor of Business Education and Technology
B.S. in Ed., Youngstown State University, 1967;
M.B.A., Kent State University, 1970.

CHARLES A. PIERCE
Assistant Professor of Criminal Justice
A.A., Bay City Jr. College, 1961;
B.S., M.S., Michigan State University, 1968, 1970.

JAMES P. POGGIONE
Assistant Professor of Mathematical and Computer Sciences
B.S. in Ed., Northern Michigan University, 1965;
M.S., Case Western Reserve University, 1967.

PEGGY O. POTTS
Assistant Professor of Business Education and Technology
B.S. in Ed., M.S. in Ed., Youngstown State University, 1961, 1972.

DAVID S. PROVANCE
Assistant Professor of Management
B.S. in C., Grove City College, 1940;
M.Litt., University of Pittsburgh, 1951.

CLEMENT C. PSENICKA
Assistant Professor of Management
B.S., Dyke College, 1969;
M.A., D.B.A., Kent State University, 1972, 1976.

DAVID L. QUINBY
Instructor in Psychology
B.A., Youngstown State University, 1952;
M.A., University of Denver, 1963.

AFZALUR M. RAHIM
Associate Professor of Management
B.Comm., M.Comm., Dacca University, Bangladesh, 1960, 1961;
Ph.D., University of Pittsburgh, 1976.

JOYCELYN L. RAMSEY
Assistant Professor of Health and Physical Education
A.A., Potomac State Jr. College, 1961;
B.S., M.S., West Virginia University, 1967, 1974.

LEON RAND
Professor of Chemistry
B.S., Northeastern University, 1953;
M.A., Ph.D., University of Texas, 1956, 1958.

K. RAM MOHAN RAO
Associate Professor of Management
B.S.M.E., Osmania University, 1968;
M.S.I.E., Purdue University, 1970;
M.B.A., D.B.A., Kent State University, 1974, 1976.

C. WADE RARIDON
Professor of Music
B.A., M.A., D.M.A., University of Iowa, 1956, 1957, 1972.

CECIL O. RATLIFF
Assistant Professor of Business Education and Technology
B.S., Arkansas State University, 1957;
M.A., George Peabody College for Teachers, 1962;
Ph.D., Oklahoma State College, 1978.

FRANCIS S. REDBURN
Assistant Professor of Political Science
B.A., Pennsylvania State University, 1966;
Ph.D., University of North Carolina, 1970.

JAMES A. REEDER
Associate Professor of Chemistry
B.S., University of Kansas, 1954;
Ph.D., University of Colorado, 1959.

CHARLES L. REID
Professor of Philosophy and Religious Studies
B.A., Bethel College, 1951;
M.A., Ph.D., Duke University, 1954, 1960.

DAVID J. REITH
Instructor in Geography
B.A., University of Oklahoma, 1963;
M.A., Miami University, 1966;
Ph.D., University of Illinois, 1975.

RONALD J. RICHARDS
Associate Professor of Education
B.A., M.S. in Ed., Ph.D., Southern Illinois University, 1962, 1965, 1970.

VICTOR A. RICHLEY
Professor of Engineering Technology
B.E., Youngstown State University, 1956;
M.S. in E., University of Akron, 1961;
Ph.D., University of Pittsburgh, 1967;
P.E., Ohio.

LEWIS B. RINGER
Professor of Health and Physical Education
B.S., Springfield College, 1956;
M.S., West Virginia University, 1962;
D.P.E., Springfield College, 1966.

JOHN F. RITTER
Associate Professor of Civil Engineering
B.E., Youngstown State University, 1962;
M.S., Carnegie-Mellon University, 1964;
P.E., Ohio, N.Y.

SIDNEY I. ROBERTS
Professor of History
B.S. in Ed., City College of New York, 1952;
M.A., Columbia University, 1953;
Ph.D., Northwestern University, 1960.

DAVID J. ROBINSON
Assistant Professor of Speech Communication and Theatre
B.A., Pepperdine College, 1957;
M.A., University of New Mexico, 1960;
Ph.D., University of Southern California, 1972.

STEPHEN E. RODABAUGH
Assistant Professor of Mathematical and Computer Sciences
B.A., M.A., Ph.D., University of Missouri, 1970, 1971, 1974.

JUANITA G. RODERICK
Professor of Education
B.S. in Ed., Youngstown State University, 1960;
M.S. in Ed., Westminster College, 1963;
Ph.D., University of Akron, 1972.

STAMAN F. RODFONG
Assistant Professor of Mathematical and Computer Sciences
B.S., M.S., Case Western Reserve University, 1962, 1964.

ROBERT L. ROLLIN
Assistant Professor of Music
B.A., City College of New York, 1968;
M.F.A., D.M.A., Cornell University, 1971, 1973.

HASSAN A. RONAGHY
Associate Professor of Economics
B.S., University of Shiraz, 1958;
M.S., Southern Illinois University, 1962;
Ph.D., University of Wisconsin, 1969.

JAMES P. RONDA
Associate Professor of History
B.A., Hope College, 1965;
M.A., Ph.D., University of Nebraska, 1967, 1970.

FRED ROSENBERG
Assistant Professor of Music
Mus.B., Cleveland Institute of Music, 1949;
M.A., Case Western Reserve University, 1952.

DOMINIC L. ROSSELLI
Assistant Professor of Health and Physical Education
B.S. in Ed., Geneva College, 1939;
M.Ed., University of Pittsburgh, 1950.

DEAN S. ROUSSOS
Associate Professor of Marketing
B.S.C., M.S., Ph.D., University of Iowa, 1958, 1960, 1970.

ROMAN V. RUDNYTSKY
Assistant Professor of Music
B.S., M.S., Juilliard School, 1964, 1965.

CHESTER E. RUFH
Assistant Professor of Biological Sciences
B.A., Youngstown State University, 1952;
M.S., Florida State University, 1953.

JAROSLAV RYSKA
Assistant Professor of Art History
Universitni Doktorat v oberech Dejiny Umeni a Estetika, Universitas Palackiana, Olomouc, 1956.

GARY M. SALVNER
Assistant Professor of English
B.A., Valparaiso University, 1968;
M.Ed., University of Missouri, 1970;
D. Cand., Ph.D., University of Michigan, 1974, 1977.

A. DUANE SAMPLE
Professor of Music
B.F.A., Carnegie-Mellon University, 1950;
M.Ed., University of Pittsburgh, 1953;
Ed.D., Columbia University, 1964.

EUGENE S. SANTOS
Professor of Mathematical and Computer Sciences
B.S.M.E., Mapua Institute of Technology, 1961;
M.S., University of the Philippines, 1963;
Ph.D., Ohio State University, 1965.

FRANK P. SARVELLO
Instructor in Music
B.M., Roosevelt University, 1963;
M.M. DePaul University, 1965.

LOWELL J. SATRE
Associate Professor of History
B.A., Augustana College, 1964;
M.A., Ph.D., University of South Carolina, 1967, 1968.

ANNE B. SCHAFER
Assistant Professor of English
B.S. in Ed., Kent State University, 1934;
M.A., Ohio State University 1941.

ANNE M. SCHEETZ
Assistant Professor of Nursing
Diploma, St. Joseph Hospital School of Nursing, Indiana, 1935;
B.S., St. Mary's College, 1937;
M.S. in Ed., Youngstown State University, 1974.

STEVEN M. SCHILDCROUT
Associate Professor of Chemistry
B.S., University of Chicago, 1964;
Ph.D., Northwestern University, 1968.

EUGENE E. SCHNEIDER
Associate Professor of Accounting and Finance
B.S. in B.A., Youngstown State University, 1948;
M.B.A., Kent State University, 1966;
C.P.A., Ohio.

HILDEGARD K. SCHNUTTGEN
Circulation Librarian with the Rank of Instructor
Examination, Buchereischule, Germany, 1941.

LAUREN A. SCHROEDER
Professor of Biological Sciences
B.S., St. Cloud State College, 1960;
A.M., Ph.D., University of South Dakota, 1965, 1968.

CAROL F. SCHULTZ
Instructor in Education
B.A., Hiram College, 1941;
B.S.L.S., Drexel Institute of Technology, 1942;
M.S.L.S., Case Western Reserve University, 1969.

WERNER W. SCHULTZ
Assistant Professor of English
B.A., Hiram College, 1941;
A.S.T.P., Kenyon College, 1943;
M.A., Oberlin College, 1950.

DOROTHY M. SCOTT
Associate Professor of Education
A.B., Webster College, 1951;
M.Ed., Ph.D., St. Louis University, 1967, 1970.

AURORA M. SEBASTIANI
Assistant Professor of Biological Sciences
B.A., Youngstown State University, 1963;
M.S., Tulane University, 1965.

MARY A. SEBESTYEN
Assistant Professor of Business Education and Technology
B.S. in Ed., Youngstown State University, 1950;
M.Ed., Kent State University, 1973.

ROBERT H. SECRIST
Professor of English
A.B., Harvard University, 1957;
M.A., Ph.D., New York University, 1959, 1965.

FRANK J. SEIBOLD
Professor of Advertising and Public Relations
B.A., M.S., Long Island University, 1956, 1960;
Ph.D., Yeshiva University, 1969.

EUGENE A. SEKERES
Associate Professor of Advertising and Public Relations
B.A., Geneva College, 1950;
M.Litt., University of Pittsburgh, 1957;
M.S., Syracuse, 1972.

HEANRY SENDAULA
Assistant Professor of Electrical Engineering
B.S., B.A., M.S., Ph.D., University of Connecticut,
1969, 1970, 1970, 1972.

VIRGINIA W. SHALE
Instructor in Speech Communication and Theatre
B.A., M.A., Ohio Wesleyan University, 1935, 1938.

HENRY P. SHENG
Professor of Chemical Engineering and Materials Science
B.S., University of Maine, 1954
M.S., Purdue University, 1958;
Ph.D., University of Oklahoma, 1968;
P.E., Ohio.

THOMAS A. SHIPKA
Associate Professor of Philosophy and Religious Studies
A.B., John Carroll University, 1966;
Ph.D., Boston College, 1969.

WILLIAM A. SHIPMAN
Assistant Professor of Economics
B.S. in Ed., Youngstown State University, 1969;
M.S., University of Pittsburgh, 1971.

RAYMOND J. SHUSTER
Professor of Management
B.S. in B.A., M.B.A., Wayne State University, 1965, 1967;
Ph.D., Michigan State University, 1971.

MARK T. SHUTES
Instructor in Sociology, Anthropology and Social Work
B.A., Youngstown State University, 1970.

MATTHEW SIMAN
Professor of Electrical Engineering
B.S.E.E., M.S.E.E., Case Institute of Technology, 1949, 1956;
Ph.D., University of Pittsburgh, 1969;
P.E., Ohio.

JANE M. SIMMONS
Instructor in Advertising and Public Relations
B.S. in B.A., Youngstown State University, 1973;
M.A., Michigan State University, 1974.

CHARLES R. SINGLER
Associate Professor of Geology
B.S., City College of New York, 1963;
M.S., Ph.D., University of Nebraska, 1965, 1969.

ALVIN W. SKARDON
Professor of History
A.B., College of Charleston, 1933;
M.A., Ph.D., University of Chicago, 1947, 1960.

SAMUEL J. SKAROTE
Associate Professor of Electrical Engineering
B.E.E., M.Sc., Ohio State University, 1960, 1965.

MORRIS SLAVIN
Professor of History
B.S. in Ed., Ohio State University, 1938;
M.A., University of Pittsburgh, 1952;
Ph.D., Western Reserve University, 1961.

TADEUSZ K. SLAWECKI
Professor of Chemical Engineering and Materials Science
B.S., University of Illinois, 1943;
M.S., Ph.D., University of Pennsylvania, 1948, 1952.

WILLIAM B. SLOCUM
Associate Professor of Music
B.F.A., M.M., University of New Mexico, 1959, 1965.

JEROME K. SMALL
Assistant Professor of Psychology
B.A., University of Virginia, 1965;
M.A., Ph.D., University of Georgia, 1969, 1972.

AGNES M. SMITH
Associate Professor of History
A.B., Hiram College, 1940;
M.A., University of West Virginia, 1944;
Ph.D., Western Reserve University, 1966.

CHARLES L. SMITH
Associate Professor of Education
B.S., University of Louisville, 1947;
M.A., Ohio State University, 1950;
Ed.D., Western Reserve University, 1968.

FRANCIS W. SMITH
Associate Professor of Chemistry
B.Sc., B.Sc., Honours, Ph.D., University of Capetown, 1952, 1954, 1967.

FRANK W. SMITH
Assistant Professor of Accounting and Finance
B.B.A., University of Miami, 1960;
M.B.A., Youngstown State University, 1976.

PHYLLIS S. SMITH
Associate Professor of Marketing
A.B., University of Cincinnati, 1964;
M.A., Louisiana State University, 1965;
Ph.D., Ohio State University, 1967.

ROBERT K. SMITH
Associate Professor of Chemistry
B.S., M.S., University of Massachusetts, 1950, 1950;
Ph.D., University of Wyoming, 1967.

GERALD E. SMOLEN
Associate Professor of Accounting and Finance
B.S., Ohio State University, 1963;
M.S., Ph.D., University of Tennessee, 1971.

JOHN W. SMYTHE
Associate Professor of Economics
B.A., Youngstown State University, 1960;
M.A., Northwestern University, 1966;
Ph.D., University of Nebraska, 1973.

STEPHEN L. SNIDERMAN
Associate Professor of English
B.A., Michigan State University, 1964;
M.A., University of Michigan, 1965;
Ph.D., University of Wisconsin, 1970.

DOROTHY A. SNOZEK
Associate Professor of Elementary Education
B.S. in Ed., California State College, 1961;
M. of Ed., Ohio University, 1964;
Ed.D., West Virginia University, 1971.

ANTHONY E. SOBOTA
Professor of Biological Sciences
B.S. in Ed., Indiana University of Pennsylvania, 1960;
M.S., Ph.D., University of Pittsburgh, 1963, 1965.

MARILYN M. SOLAK
Professor of Education
A.B., Mount Union College, 1947;
M.Ed., Kent State University, 1950;
Ed.D., Case Western Reserve University, 1963.

JOSEPH SOLIMINE, JR.
Associate Professor of English
B.A., Brown University, 1956;
M.A., University of Rhode Island, 1959;
Ph.D., University of Pennsylvania, 1964.

HILARY A. SOLLER
Instructor in Allied Health
B.S., Ohio State University, 1975

DONNA F. SOLOVAN
Instructor in Allied Health
B.S., West Liberty State College, 1975;
M.S., University of Michigan, 1977.

ROBERT J. SOROKACH
Professor of Industrial Engineering
B.E., Youngstown State University, 1961;
M.S. in E., University of Akron, 1964.

LEONARD B. SPIEGEL
Professor of Chemistry
B.A., New York University, 1950;
M.S., Ph.D., Florida State University, 1954, 1963.

ARTHUR G. SPIRO
Associate Professor of Music
B.A., M.A., University of Minnesota, 1951, 1953;
Ph.D., Boston University, 1961.

ROBERT J. STANKO
Assistant Professor of Criminal Justice
B.A., Youngstown State University, 1963;
M.A., University of Akron, 1970.

DAVID E. STARKEY
Associate Professor of Music
B.M., M.M., Indiana University, 1957, 1958.

SISTER ELIZABETH STAUDT
Assistant Professor of Biological Sciences
B.S., Notre Dame College, Cleveland, 1939;
M.S., Villanova University, 1948.

EDGAR W. STEELE
Assistant Professor of Military Science
B.A., Eastern Kentucky University, 1967;
M.S., University of Kentucky, 1975.

JAMES D. STEELE
Associate Professor of Education
B.S. in Ed., M.E., Kent State University, 1949, 1952;
Ph.D., Ohio University, 1967.

DAVID T. STEPHENS
Assistant Professor of Geography
A.A., El Reno Junior College, 1962;
B.S., Oklahoma State University, 1964;
M.A., University of Oklahoma, 1966;
Ph.D., University of Nebraska, 1975.

ANTHONY H. STOCKS
Professor of Economics
B.A., San Jose State College, 1953;
M.A., Syracuse University, 1956;
Ph.D., State University of New York at Buffalo, 1963.

NICHOLAS STURM
Assistant Professor of Biological Sciences
B.S., West Virginia Wesleyan College, 1952;
M.S., Purdue University, 1954.

B. SUBRAMANIAN
Assistant Professor of Mathematical and Computer Sciences
B.A., Annamalai University, 1947;
M.Sc., Andhra University, 1950;
Ph.D., Lehigh University, 1968.

DANIEL H. SUCHORA
Assistant Professor of Engineering Technology
B.E., M.S., Youngstown State University, 1968, 1970;
Ph.D., Case Western Reserve University, 1973;
P.E., Ohio.

GEORGE E. SUTTON
Professor of Engineering
B.S.M.E., West Virginia University, 1948;
M.S.E., University of Florida, 1952;
Ph.D., Michigan State University, 1957;
P.E., Ariz., Fla., Nev., Ohio.

WILLIAM O. SWAN
Professor of Education
B.S., Youngstown State University, 1950;
M.S., Westminster College, 1952;
Ph.D., University of Pittsburgh, 1965.

CALVIN J. SWANK
Associate Professor of Criminal Justice
A.A., Palm Beach Junior College, 1968;
B.S., Florida State University, 1970;
M.S., Ph.D., Michigan State University, 1971, 1972.

CHRISTOPHER J. SWEENEY
Professor of Psychology
A.B., Boston College, 1964;
M.Ed., Northeastern University, 1966;
Ph.D., University of Oklahoma, 1968.

LESLIE v. SZIRMAY
Associate Professor of Chemical Engineering and Materials Science
B.S., Eotvos University, 1949;
M.S., University of Detroit, 1962;
M.E. in Nucl.E., Iowa State University, 1967;
Ph.D., University of Denver, 1969;
P.E., Ontario.

RONALD TABAK
Assistant Professor of Physics
B.S., Youngstown State University, 1968;
M.S., University of Washington, 1969;
Ph.D., Ohio State University, 1976.

MURAT M. TANIK
Instructor in Engineering Technology
B.S., Middle East Tech University, Turkey, 1971;
M.C.S., Texas A&M University, 1972.

FRANK J. TARANTINE
Professor of Mechanical Engineering
B.E., Youngstown State University, 1957;
M.S. in E., University of Akron, 1961;
Ph.D., Carnegie-Mellon University, 1966;
P.E., Ohio.

WILMA A. THOMPSON
Assistant Professor of Health and Physical Education
B.S. in P.E., Boston University, 1940;
M.S., University of Wisconsin, 1947.

SARA T. THROOP
Assistant Professor of Education
B.A., Case Western Reserve University, 1948;
M.S. in Ed., Westminster College, 1951;
Ph.D., University of Akron, 1971.

JAMES R. TOEPFER
Associate Professor of Biological Sciences
B.A., M.A., Ph.D., Kent State University, 1964, 1965, 1969.

GLORIA D. TRIBBLE
Assistant Professor of Education
B.S. in Ed., Youngstown State University, 1958;
M.Ed., Kent State University, 1964;
Ph.D., University of Akron, 1973.

JOHN R. TURK
Assistant Professor of Music
B.M.E., Baldwin-Wallace College, 1967;
M.M., Indiana University, 1971.

RICHARD A. ULRICH
Assistant Professor of Art
B.S. in Ed., Youngstown State University, 1962;
M.A., Kent State University, 1966.

FRANK R. URBANCIC
Associate Professor of Accounting and Finance
B.S., Cleveland State University, 1972;
Ph.D., Kent State University, 1977.

CLYDE V. VANAMAN
Professor of Education
B.S., Mount Union College, 1941;
B.A., Youngstown State University, 1953;
M.Ed., Kent State University, 1950;
Ed.,D., Case Western Reserve University, 1961.

HELEN S. van GORDER
Instructor in English
B.A., M.A., Pennsylvania State University, 1944, 1957.

JOHN D. VAN NORMAN
Professor of Chemistry
B.S., University of Rochester, 1955;
Ph.D., Rensselaer Polytechnic Institute, 1960.

PAUL D. VAN ZANDT
Professor of Biological Sciences
A.B., Greenville College, 1952;
M.S., University of Illinois, 1953;
M.S.P.H., Ph.D., University of North Carolina, 1955, 1960.

MARIO A. VECCIA
Assistant Professor of Foreign Languages and Literatures
Laurea di Dottore in Lettere, University of Naples, Italy, 1948.

LARRY A. VIEHMEYER
Associate Professor of Foreign Languages and Literatures
B.S. in Ed., Western Illinois University, 1964;
A.M., Ph.D., University of Illinois, 1967, 1971.

DONALD E. VOGEL
Professor of Music
B.M., M.M., Indiana University, 1953, 1956;
Ed.D., Columbia University, 1966.

RONALD P. VOLPE
Associate Professor of Accounting and Finance
B.S. in B.A., Youngstown State University, 1964;
M.B.A., Central Michigan University, 1968;
Ph.D., University of Pittsburgh, 1975.

PETER W. von OSTWALDEN
Professor of Chemistry
Doctorandum, University of Graz, Austria, 1950;
M.A., Ph.D., Columbia University, 1954, 1958.

MARK F. WALKER
Professor of Music
B.M., M.M., Butler University, 1940, 1949;
Ph.D., Indiana University, 1955.

WILLIAM E. WALSH
Associate Professor of Management
B.S. in B.A., Youngstown State University, 1957;
M.B.A., Case Western Reserve University, 1962.

MARTHA Z. WALTON
Assistant Professor of Business Education and Technology
B.S. in B.A., Miami University, 1941;
M.Ed., Kent State University, 1972.

MICHAEL J. WALUSIS
Associate Professor of Art
B.F.A., University of Notre Dame, 1964;
M.F.A., Ohio State University, 1967.

MARY L. WEDEKIND
Instructor in Health and Physical Education
B.S., Pennsylvania State University, 1950;
M.Ed., Kent State University, 1968.

NELL G. WHIPKEY
Associate Professor of Mathematical and Computer Sciences
A.B., Brown University, 1949;
M.S. in Ed., Westminster College, 1959.

JOHN R. WHITE
Associate Professor of Sociology, Anthropology and Social Work
A.A., City College of San Francisco, 1961;
B.A., San Francisco State College, 1963;
M.A., Ph.D., University of Oregon, 1969, 1974.

LEONARD A. WHITNEY
Associate Professor of Health and Physical Education
B.S. in Ed., Youngstown State University, 1962;
M.S. in P.E., Springfield College, 1963;
Ph.D., Ohio State University, 1970.

JERRY D. WILKERSON
Instructor in Health and Physical Education
B.S. in Ed., Ohio University, 1966;
M.Ed., University of Cincinnati, 1969.

JOHN WILKINSON
Assistant Professor of English
B.A., University of Hull, 1964;
Ph.D., State University of New York at Buffalo, 1970.

BERNARD S. WINICK
Assistant Professor of Management
B.S., Ohio State University, 1955;
J.D., University of Akron, 1964.

ROBERT J. WOLANIN
Associate Professor of Management
A.B., Westminster College, 1949;
M.A., University of Pittsburgh, 1960.

BARBARA L. WRIGHT
Associate Professor of Health and Physical Education
B.S., M.Ed., Kent State University, 1967, 1969.

JOHN J. YEMMA
Associate Professor of Biological Sciences
B.S. in Ed., Youngstown State University, 1961;
M.A., George Peabody College, 1965;
Ph.D., Pennsylvania State University, 1971.

RALPH E. YINGST
Associate Professor of Chemistry
A.B., University of Chicago, 1950;
B.S., Lebanon Valley College, 1955;
Ph.D., University of Pittsburgh, 1964.

WARREN M. YOUNG
Associate Professor of Physics and Astronomy
B.S., Case Western Reserve University, 1960;
M.S., Ph.D., Ohio State University, 1961, 1971.

BERNARD J. YOZWIAK
Professor of Mathematics
A.B., Marietta College, 1940;
M.S., Ph.D., University of Pittsburgh, 1951, 1961.

JEROME E. ZETTS
Associate Professor of Accounting and Finance
B.S. in B.A., Youngstown State University, 1965;
M.B.A., Wayne State University, 1967.
C.P.A., Ohio.

LOUIS A. ZONA
Associate Professor of Art
B.S. in Ed., Youngstown State University, 1966;
M.S. in Ed., University of Pittsburgh, 1969;
D.A., Carnegie-Mellon University, 1973.

EMERITI OF YOUNGSTOWN STATE UNIVERSITY

HOWARD W. JONES
President Emeritus
A.B., Hiram College;
M.A., Western Reserve University;
D.Ped., Westminster College.
Retired, 1966.

WILLIAM C. BAKER
Assistant Professor Emeritus of English
A.B., Mount Union College;
M.A., University of Pittsburgh.
Retired, 1975.

DAVID M. BEHEN
Professor Emeritus of History
Ph.B., Ph.D., University of Chicago.
Retired, 1976.

PAULINE E. BOTTY
Professor Emerita of Sociology and Anthropology
B.S. in Ed., New York State University;
J.D., Youngstown State University;
M.A., Case Western Reserve University.
Retired, 1971.

CATHERINE M. BRIDGHAM
Professor Emerita of Chemistry
B.S., University of Michigan;
Ph.D., University of Pittsburgh.
Retired, 1969.

MARION K. BROWNE
Assistant Professor Emerita of Merchandising
A.B., Eastern Michigan State College;
M.S., New York University.
Retired, 1968.

PHILIP P. BUCHANAN
Registrar with Rank of Assistant Professor Emeritus
A.B., Hiram College;
M.Ed., University of Pittsburgh.
Retired, 1966.

WILLIAM B. CARSON
Associate Professor Emeritus of Health and Physical Education
B.S. in Ed., Youngstown State University;
M.Ed., Westminister College.
Retired, 1978.

M. JEAN CHARIGNON
Professor Emeritus of Industrial Engineering
B.S.M.E., B.S.E.S., M.E., North Dakota State University;
M.S., Ph.D., University of Pittsburgh.
P.E., Ohio.
Retired, 1978.

PAUL CRESS
Assistant Professor Emeritus of Criminal Justice
B.Th., Nyack Missionary College.
Retired, 1978.

NELLIE GWYNNE DEHNBOSTEL
Associate Professor Emerita of Biology
Mus.B., F.C.M., Mus.M., Dana's Musical Institute;
B.A., B.S., in Ed., M.A., Kent State University.
Retired, 1969.

CHRISTINE R. DYKEMA
Professor Emerita of Foreign Languages
A.B., Barnard College, Columbia University;
M.A., Western Reserve University.
Retired, 1978.

LOUISE H. EINSTEIN
Assistant Professor Emerita of English
A.B., Chatham College;
M.Ed., University of Pittsburgh.
Retired, 1975.

FRANK M. ELLIS
Professor Emeritus of Physics and Astronomy
B.S., Carnegie-Mellon University; M.Ed., M.S., University of Pittsburgh.
Retired, 1976.

ALFONSO L. GARCIA
Associate Professor Emeritus of Foreign Languages and Literatures
A.B., Instituto de la Habana;
Doctor en Leyes, Universidad de la Habana;
Diplomado en Filologia Hispanica, Universidad de Salamanca.
Retired, 1977.

JOHN PAUL GILLESPIE
Assistant Professor Emeritus of Merchandising and Dean of Men
B.S. in B.A., Youngstown State University.
Retired, 1970.

WILLIAM W. HANKS
Associate Professor Emeritus of Marketing
B.S., Mississippi Delta State Teachers College;
M.S., New York University.
Retired, 1978.

DAVID S. IVES
Associate Professor Emeritus of English
B.A., Baldwin-Wallace College;
M.A., Western Reserve University.
Retired, 1978.

VERA R. JENKINS
Professor Emerita of Accounting and Finance
B.A., M.S., Youngstown State University;
M.Ed., University of Pittsburgh.
Retired, 1978.

HAROLD NELS JOHNSON
Assistant Professor Emeritus of Mechanical Engineering
B.S. in Ed., M.A., Ohio State University;
LL.B., Youngstown State University.
Retired, 1969.

WALTER EDWIN MAYER
Professor Emeritus of Psychology
B.A., Ohio Northern University;
M.Ed., Ph.D., University of Pittsburgh.
Retired, 1967.

EDNA K. McDONALD
Associate Professor Emerita of Sociology, Anthropology and Social Work
A.B., Youngstown State University;
M. Litt., University of Pittsburgh.
Retired, 1978.

ANNIE M. McMILLAN
Associate Professor Emerita of Home Economics
B.Sc., Mount Allison University;
A.M., M.S., Ed.D., Columbia University.
Retired, 1974.

HOWARD HENRY MILLER
Instructor Emeritus in Education
A.B., Manchester College;
M.Ed., University of Pittsburgh.
Retired, 1970.

EDWARD T. REILLY
Professor Emeritus of Accounting
B.S. in B.A., Youngstown State University;
M.B.A., Case Western Reserve University.
Retired, 1972.

LEONARD T. RICHARDSON
Associate Professor Emeritus of Ancient and Modern Languages
B.A., Aurora College;
M.A., University of Chicago;
Docteur de l'Universite, Grenoble.
Retired, 1966.

BRUCE T. RILEY
Professor Emeritus of Philosophy and Religious Studies
A.B., Cornell College;
S.T.B., Ph.D., Boston University.
Retired, 1974.

GEORGE H. SCHOENHARD
Professor Emeritus of Education
A.B., Youngstown State University;
Litt.M., Ed. D., University of Pittsburgh.
Retired, 1977.

GERHARD M. STEIN
Associate Professor Emeritus of Electrical Engineering
Diplom Ingenieur, Dr. Ingenieur, Technische Hochshule, Germany.
Retired, 1972.

ELIZABETH I. STERNBERG
Professor Emerita of Political Science and Social Science
A.B., Knox College:
M.A., Radcliffe College:
Ph.D., University of Chicago.
Retired, 1978.

JOSEPH F. SWARTZ
Professor Emeritus of Education
A.B., Bridgewater College;
M.Ed., Ph.D., University of Pittsburgh.
Retired, 1973.

DUMITRU TEODORESCU
Professor Emeritus of Management
B.S., St. Sava State College, Bucharest, Romania;
M.S. in L.S., Case Western Reserve University;
A.M., L.M., Ph.D., Bucharest State University.
Retired, 1976.

MAE D. TURNER
Associate Professor Emerita of Business Education and Secretarial Studies
A.B., Youngstown State University;
M.S. in Ed., Westminster College.
Retired, 1973.

WILLARD L. WEBSTER
Associate Professor Emeritus of Biological Sciences
B.S., Geneva College.
Retired, 1974.

THE WALTER E. AND CAROLINE H. WATSON FOUNDATION MERIT AWARDS

1959 - 1960
Karl H. Benkner ..... Mechanical Engineering
Karl Washburn Dykema..... English
Jay Rodkey..... Accounting
George Milo Wilcox..... Education

1960 - 1961
Mary Wagstaff Jones..... Communication
Margarita Mills ..... Spanish
Eugene Dodd Scudder ..... Chemistry
Bernard James Yozwiak ..... Mathematics

1961 - 1962
Gus Mavrigian ..... Mathematics
Alvin Myerovich ..... Music
Edward Thomas Reilly..... Business Organization
Clair L. Worley ..... Biology

1962 - 1963
Pauline Esterhay Botty ..... Sociology
Frank Angelo D'Isa .. Mechanical Engineering
Francis Kravec..... Biology
Willard L. Webster ..... Biology

1963 - 1964
David Marion Behen ..... History
Irwin Cohen ..... Chemistry
Thaddeus Michael Dillon ..... Mathematics
George Henry Schoenhard..... Education

1964 - 1965
Christine Rhoades Dykema..... French
Anthony Michael Lang ..... Philosophy and Religion
Victor Anthony Richley..... Electrical Engineering
Myron James Wisler ..... Music

1965 - 1966
Thomas D. Y. Fok..... Civil Engineering
Philip Jerome Hahn ..... Economics
Vera Jenkins..... Accounting and Business
Theodore Thomas Macejko..... Business Administration

1966 - 1967
Jack Donald Foster..... Sociology
Jon Michael Naberezny ..... Art
Paul C. Luginbill..... Chemical Engineering
Lois M. Hopkins ..... Music

1967 - 1968
Catherine M. Bridgham..... Chemistry
Frank M. Ellis..... Physics
James W. Kiriazis ..... Sociology
Bernard J. Vojtko ..... Electrical Engineering

1968 - 1969
Ivis Boyer..... Political Science
Marvin W. Chrisp ..... Education
Esther P. Niemi..... Economics
William Petrych..... Accounting

1969 - 1970
Leslie S. Domonkos..... History
Joseph R. Lucas..... Philosophy and Religious Studies
Matthew Siman..... Electrical Engineering
Paul D. Van Zandt..... Biology

1970 - 1971
Margaret A. Braden ..... Education
Alfred L. Bright..... Art
Raymond W. Hurd ..... Mathematics
Inally Mahadeviah..... Chemistry

1971 - 1972
Frederick J. Blue..... History
Frank A. Fortunato..... Management
Thelma S. Miner ..... English
Duane Sample..... Music

1972 - 1973
Dwight V. Beede ..... Biology
Ronald L. Gould..... Music
Renee D. Linkhorn..... Foreign Languages
Margaret I. Pfau ..... English

1973 - 1974
Barbara H. Brothers..... English
E. Terry Deiderick ..... Marketing

1974 - 1975
Esotto Pellegrini..... Music
James P. Ronda ..... History

1975 - 1976
Larry E. Esterly ..... Political Science

1977-78
Donald W. Byo..... Music
Frank A. D'isa ..... Mechanical Engineering

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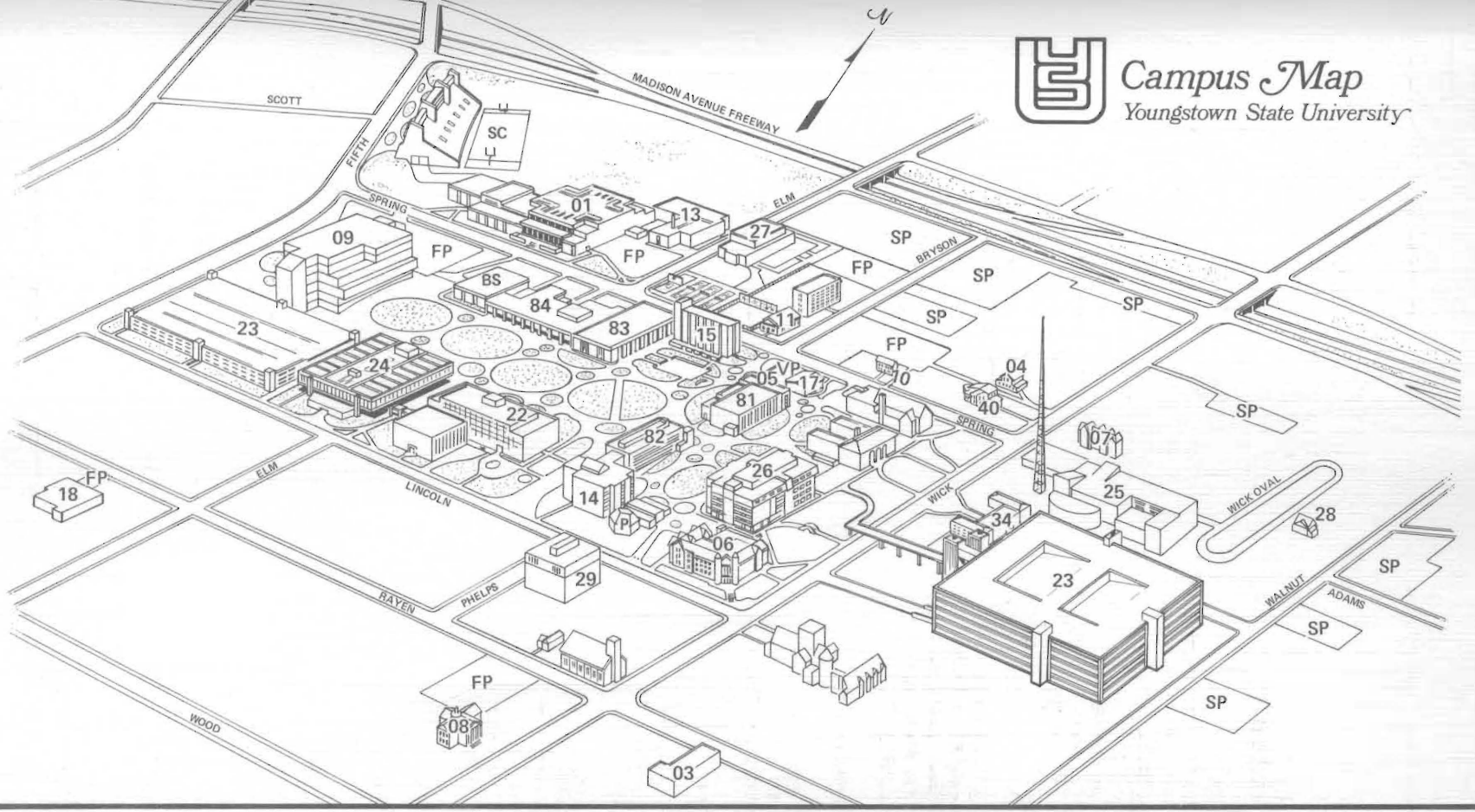

BUILDING NUMBERS

01 Beeghly Center
03 Clingan-Waddell Hall
04 Dana Main
05 Tod Hall
06 Jones Hall
07 Pollock House
08 Rayen Hall
09 College of Arts & Sciences Building
10 North Annex
11 Dana Recital Hall
13 School of Education
14 Ward Beecher (new section)
15 Kilcawley Men's Residence Hall
17 Central Hall
18 Central Receiving–Physical Plant
22 Engineering Science Building
23 Parking Decks
24 Cushwa Hall
25 Bliss Hall
26 Maag Library
27 Central Utility Plant
28 Dana Annex
29 Lincoln Project
34 Office Building
40 Disciple House
81 Administration Building
82 Ward Beecher (old section)
83 Kilcawley Center
84 Kilcawley Addition
BS- Bookstore
SC- Sports Complex
FP- Faculty Parking
SP- Student Parking
VP- Visitors' Parking
P- Planetarium