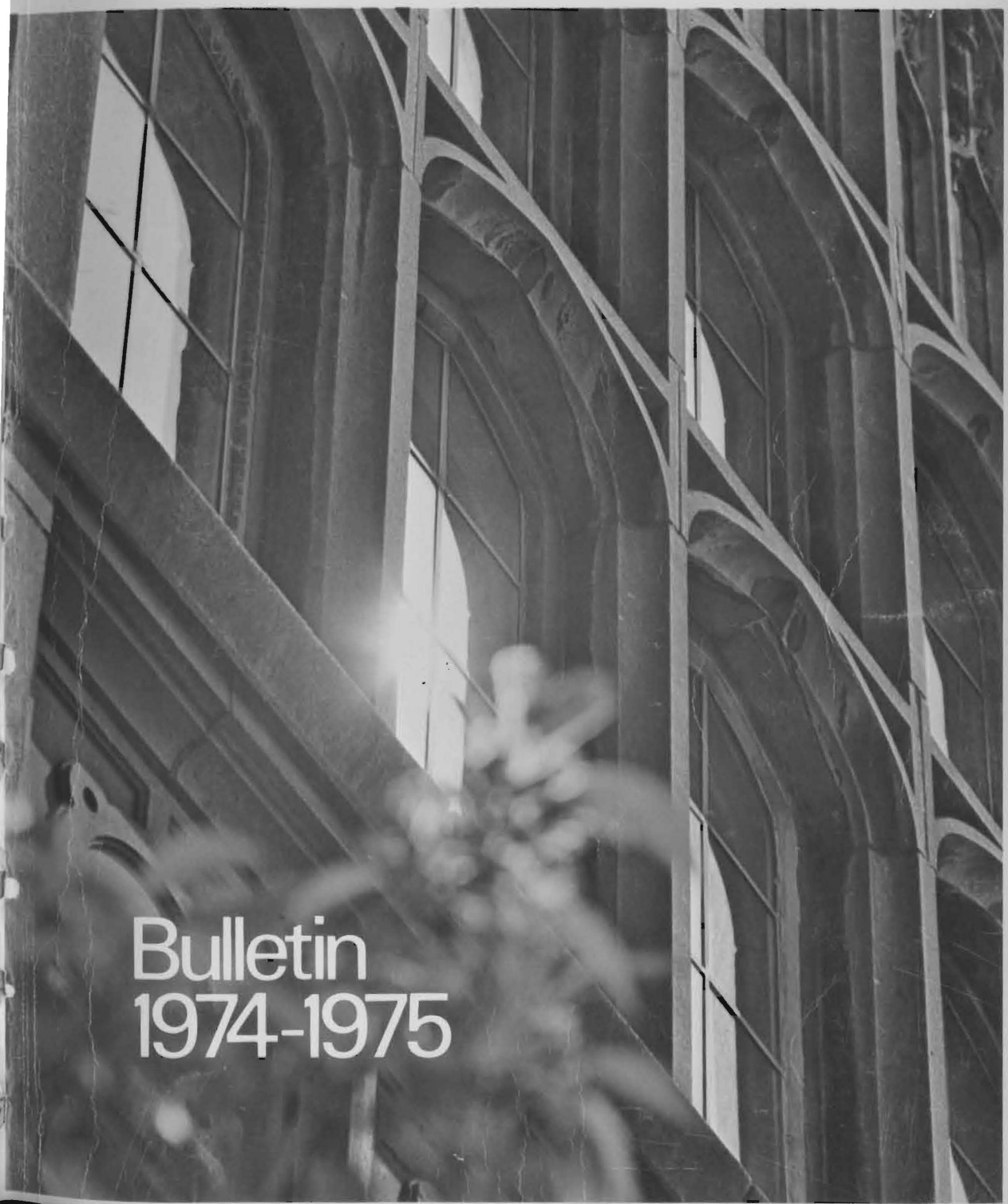
Youngstown State University

Mrs. Ducey
Library



Bulletin 1974-1975

Youngstown State University

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YOUNGSTOWN STATE UNIVERSITY BULLETIN
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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 William Rayen School of Engineering is accredited by the Engineers' Council for Professional Development for its day and evening curriculums for civil, electrical, metallurgical, and mechanical engineering. The electrical engineering technology program is also accredited by the Engineers' Council for Professional Development. 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.).

SLOW

ON AIR

FALL QUARTER 1974

Sept. 26	Thurs.	0800	Classes Begin
Oct. 2	Wed.	1900	Last day to add a class
Oct. 5	Sat.	1100	Last day to apply for Fall Quarter Graduation
Nov. 6	Wed.	1900	Last day for withdrawing with a W
Nov. 27	Wed.	2300	Thanksgiving Vacation Begins
Dec. 2	Mon.	0800	Thanksgiving Vacation Ends
Dec. 9	Mon.	0800	Final Examinations Begin
Dec. 14	Sat.	1430	Final Examinations End
Dec. 25	Wed.		Christmas Holiday—University closed

WINTER QUARTER 1975

Jan. 6	Mon.	0800	Classes Begin
Jan. 11	Sat.	1100	Last day to add a class
Jan. 11	Sat.	1100	Last day to apply for Winter Quarter Graduation
Feb. 15	Sat.	1100	Last day for withdrawing with a W
Feb. 17	Mon.		Legal Holiday—University closed
Mar. 17	Mon.	0800	Final Examinations Begin
Mar. 22	Sat.	2200	Final Examinations End
Mar. 29	Sat.	1000	Winter Commencement

SPRING QUARTER 1975

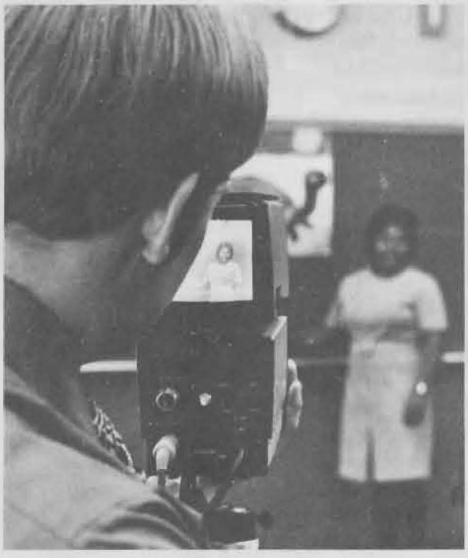
Mar. 31	Mon.	0800	Classes Begin
April 5	Sat.	1100	Last day to add a class
April 5	Sat.	1100	Last day to apply for Spring Quarter Graduation
May 10	Sat.	1100	Last day for withdrawing with a W
May 26	Mon.		Legal Holiday—University closed
June 9	Mon.	0800	Final Examinations Begin
June 14	Sat.	1430	Final Examinations End
June 21	Sat.	1000	Spring Commencement

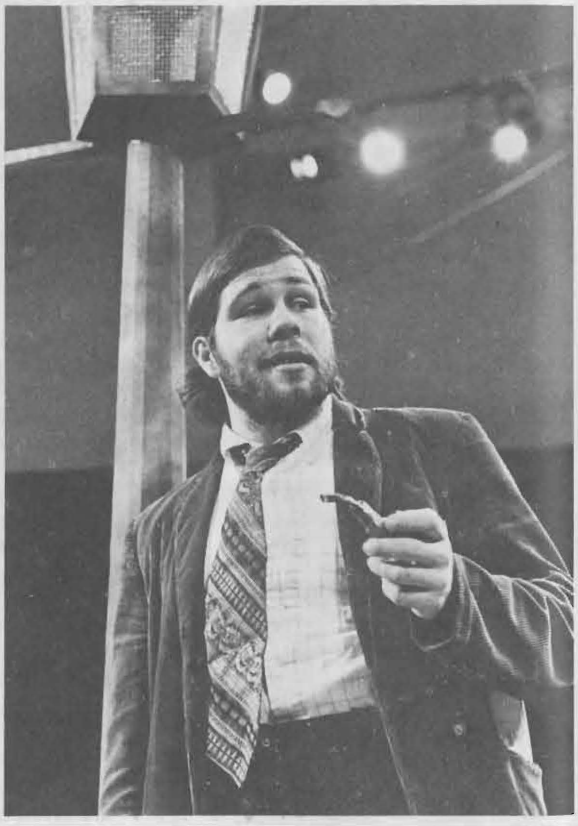
SUMMER QUARTER 1975

June 18	Wed.	0800	Classes Begin—Entire Summer Quarter and First Term
June 21	Sat.	1100	Last day to add a class—First Term
June 24	Tues.	1800	Last day to add a class—Entire Summer Quarter
June 30	Mon.	1800	Last day to apply for Summer Quarter Graduation
July 4			Legal Holiday—University closed
July 8	Tues.	1800	Last day for withdrawing with a W—First Term Classes
July 22	Tues.	2200	First Term Ends (Final Examinations for First Term Classes are given during Last Scheduled Class Period)
July 24	Thurs.	0800	Second Term Begins
July 28	Mon.	1800	Last day to add a class—Second Term
July 29	Tues.	1800	Last day for withdrawing with a W—Entire Summer Quarter Classes
Aug. 13	Wed.	1800	Last day for withdrawing with a W—Second Term Classes
Aug. 27	Wed.	2200	Final Examinations End—Entire Summer Quarter Classes (Final Examinations given during Last Scheduled Class Period)
Aug. 27	Wed.	2200	Final Examinations End—Second Term Classes (Final Examinations given during Last Scheduled Class Period)
Aug. 27	Wed.	2200	Second Term and Entire Summer Quarter Ends
Sept. 6	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

It is the aim of Youngstown State University to make higher education available to all high school graduates. Those with superior high school records are admitted without restriction while those with less satisfactory records may be admitted on condition that they carry the reduced academic schedule prescribed by the University. The University recognizes that such a broad admission policy carries with it the obligation to provide disciplines of established collegiate standards.

The University seeks to develop in the student the qualities of intellectual and emotional maturity necessary to produce graduates who are economically self-sufficient, socially valuable, and culturally and spiritually mature.

The University strives to maintain educational policies which are conducive to the presentation of the varied social, political, economic, and cultural ideas relevant to an understanding of contemporary existence.

The University endeavors to serve its community and the nation by being continually alert to the needs of a dynamic society and by providing curriculums to meet those needs without sacrificing the values of a long tradition of liberal education.

EQUAL EDUCATIONAL OPPORTUNITY

Youngstown State University is in full accord with both federal and state laws prohibiting discriminatory practices with respect to equal opportunity because of race, color, sex, religion, national origin, or ancestry. This applies to employment as well as all operational aspects of the University involving students, faculty, and other employees.

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, and was renamed Youngstown State University.

The Graduate School and the Technical and Community College were established during the spring of 1968. The College of Fine and Performing Arts, organized around the Department of Art, the Department of Speech and Dramatics, and the Dana School of Music, 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 of military service.

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

The Graduate School

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 Technical and Community College

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 GRADUATE SCHOOL

The Graduate School offers programs in economics, English, and history leading to the Master of Arts degree; programs in biology, chemistry, criminal justice, and mathematics leading to the Master of Science degree; programs in accounting, management, and marketing leading to the Master of Business Administration degree; programs in music education, performance, music theory and composition, music history and literature, and woodwind specialization leading to the Master of Music degree; programs in civil, electrical, mechanical, and materials science engineering 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 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 schools of Business Administration, Education, Engineering, and Music, and the Technical and Community College.

Courses taken primarily in the College of Arts and Sciences lead to one of three degrees: Bachelor of Arts, Bachelor of Science, or Bachelor of Science in Education. The major subject may be anthropology, biology, chemistry, classical studies, 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, or Spanish, or a combined major in the sciences, social studies, or the humanities. Courses are also offered in astronomy, the Bible, composition (written and oral expression), ancient Greek, journalism, 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, retail or industrial marketing, 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 degree of Bachelor of Arts 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 Technical and Community College 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 courses 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 and Dramatics, and the Dana School of Music.

THE TECHNICAL AND COMMUNITY COLLEGE

The Technical and Community College offers courses leading to the Bachelor of Science in Applied Science in civil engineering technology, corrections, electrical engineering technology, food and nutrition, home economics, law enforcement administration, mechanical engineering technology, and nursing; to the Associate in Arts degree; to the Associate in Applied Business degree in accounting technology, advertising technology, business management technology, commercial art technology, general administration technology, marketing technology, medical secretary, public administration technology, real estate technology, secretarial studies, and transportation management technology; and to the Associate in Applied Science degree in child care technology, civil engineering technology, computer technology, dietary technology, electrical engineering technology, mechanical engineering technology, metallurgical engineering technology, nursing, and police science technology. In cooperation with the School of Education it prepares secondary school teachers in business education and home economics.

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 to operate the Northeastern Ohio Universities College of Medicine.

The first class of students will be admitted to this non-traditional medical program in the fall of 1975. Students will be identified as "provisional medical students" during their first two years of university work. Clinically related experiences will be made a part of the students' education so that they will begin to appreciate the relevance of science courses to their future role. After the second year (eight quarters) of college-level work, provisional 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.

Prospective students who are applying for admission to Youngstown State University as "provisional medical students" are required to submit an application for admission to the YOUNGSTOWN STATE UNIVERSITY MEDICAL SCHOOL ADMISSIONS COMMITTEE by December, 1974.

SPECIALIZED STUDIES

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 is valuable for pre-professional training including some areas of business, law, social work, and the humanities. A black studies minor strengthens majors in related areas, especially in economics, education, English, history, philosophy, political science, religious studies and sociology. Both the major and minor programs provide diverse employment, graduate and postgraduate opportunities.

THE 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 extension and assistance to public and private organizations in the area.

CONTINUING EDUCATION AND PUBLIC SERVICES

The Department of Continuing Education and Public Services was established to make available to the citizens of Northeastern

Ohio the various resources of the University. Its function is seen as an integral part of Youngstown State University's effort to serve the educational needs of the adults in this geographical area.

The goal of the department is to serve the citizens of Northeastern Ohio by providing adult educational programs which would otherwise not be available. The department is concerned with organizing and administering credit and college-level non-credit courses. It also provides such activities as workshops, conferences, seminars, and community lecture series. These programs are intended to make it possible for adults to advance in their profession, to become better citizens, and to pursue their own educational objectives and intellectual interests. Transcripts are not required for admission into the non-credit programs.

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. In 1952 and 1953 the Library and the adjoining John Tod Hall were built; in 1959 the Science Building; in 1962 the Bookstore; in 1966 the Kilcawley Student Center; in 1967 the Ward Beecher Science Hall, and the Engineering Science Building in 1968.

In addition to the 23 major buildings already in use on the campus, the University is currently engaged in a six-year, multi-million-dollar campus development program. Recently opened is a new health and physical education building with an indoor Olympic-size swimming pool, an addition to the existing Student Center, a power plant and distribution system, and a parking garage with a capacity of 1250 cars. Now under construction is a new library capable of housing one-half million volumes, a music and fine arts building, and a Technical and Community College building.

The University's land area currently consists of 60.9 acres on the main campus, 17.6 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.

BUILDINGS AND OTHER FACILITIES

The main part of the University campus extends from Wick Avenue to Fifth Avenue, bounded by Spring Street on the north and Lincoln Avenue on the south side. In this area are the buildings which house most of the College of Arts and Sciences, the School of Business Administration, the School of Engineering, the Technical and Community College, and the Graduate School. The principal building of the Dana School of Music is on Wick Avenue north of Spring Street; the Dana Recital Hall is on Spring and the Dana Studio on Bryson Street. The School of Education building is on Elm Street. Pollock House, used in part by the College of Arts and Sciences, is opposite the Dana School of Music on Wick Avenue. Rayen Hall, on Wick Avenue near Rayen Avenue, houses classrooms and part of the Technical and Community College.

THE CENTRAL CAMPUS

The prominent building in the central campus is the 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 addition to University administrative offices and the auditorium, it contains classrooms and some of the departmental offices of the College of Arts and Sciences.

The Administrative Annex, located on Lincoln Avenue south of Jones Hall, houses the offices of Student Financial Aids, Black Studies, and Career Planning and Placement.

C. J. STROUSS MEMORIAL AUDITORIUM

C. J. Strouss Memorial Auditorium was built in honor of C. J. Strouss, late president of the Strouss-Hirshberg Company and long a devoted friend and trustee of Youngstown State University. The hall is an enlargement of a much smaller unit originally contained in Jones Hall, of which the newer structure forms a wing. The auditorium seats 800 people, 150 of them in a balcony, and with its large stage provides facilities for concerts, operas, plays, lectures, and assemblies.

THE UNIVERSITY LIBRARY

The Youngstown State University Library is in the center of the campus, and all departments are served in this centralized facility. At present it contains more than 325,000 volumes and 3,200 periodical subscriptions, as well as 340,000 units in microform. The Library is constantly growing to serve the need for materials for instruction, recreation, cultural advancement, and research.

The Library has open stacks with study carrels alternating with each row of book stacks which permits the student to study in the area of the subject being pursued. Built-in display cases in the halls provide places for exhibitions of various kinds, and the Purnell Room on the third floor is a browsing and smoking room. Coin-operated book-copying machines are on the two lower floors.

While the book collection covers all academic fields, it is strong in metallurgy and chemistry. Outstanding also are the collection of books on names, on criminology and Judaica. An organization called the Friends of Youngstown State University Library has been responsible for many library purchases.

JOHN TOD HALL

John Tod Hall, a wing at the north end of the Library building, contains classrooms. It is named for the late John Tod, a friend of the University and a leading Youngstown philanthropist.

THE WARD BEECHER SCIENCE HALL

The science building, housing the science departments and laboratories of the College of Arts and Sciences, is located at 505 Bryson Street. The four-story building was constructed in 1958 with an addition completed in 1966. It was built at a cost of over $3,000,000, with funds contributed by Mahoning Valley industries and Mr. 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 the Dana School of Music, 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. and 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.

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 Mr. John R. T. Clingan of Niles, Ohio. Situated on Rayen Avenue just east of Wick Avenue, it houses the Department of Art and Department of Home Economics.

RAYEN HALL

Rayen Hall, on the west side of Wick Avenue south of Rayen Avenue, is the former home of the 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 headquarters, the building was made available to Youngstown State University. Until the winter quarter of 1968 it housed the William Rayen School of Engineering; it is now utilized for general University classes. It houses the departments of Business Education and Secretarial Studies and Nursing.

THE SCHOOL OF EDUCATION BUILDING

The School of Education building, formerly the Elm Street School, is a modern brick building with 18 classrooms, offices for administrative personnel, a gymnasium, showers, and other facilities. The building is being used by the School of Education and the Geography Department. Built in 1951, it was purchased from the Youngstown Board of Education in September 1965, and remodeled to meet the needs of the University at a cost of $800,000 including the remodeling.

KILCAWLEY CENTER

The first building constructed as part of the University's Campus Development Plan

was the Kilcawley Center. The Center includes a dining room, lounges, and meeting rooms. The first floor of its residence wing houses the offices of Student Affairs. 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.

A 92,000-square-foot 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.

THE EXECUTIVE OFFICES

The Executive Offices of Youngstown State University are located directly south of the Butler Institute of American Art on Wick Avenue in a home formerly used as a residence by the President of the University. The recently remodeled facility now accommodates the President of the University, Vice President for Academic Affairs, Vice President for Administrative Affairs, Director of Institutional Research, Director of University Relations, and the Alumni Office.

ENGINEERING SCIENCE BUILDING

The $5,000,000 Engineering Science Building is located directly west of the Ward Beecher Science Hall. An L-shaped structure containing some 171,000 square feet of floor space, it houses the William Rayen School of Engineering, the Mathematics Department, Schwebel Auditorium, the Computer Center, and parts of the Technical and Community College including the Dean's Office.

ARTS AND SCIENCES OFFICE BUILDING

This building, at 521 Wick Avenue, houses the offices of six departments—Economics, English, History, Philosophy and Religious Studies, Political Science, and Speech and Dramatics; the office of the dean of the College of Arts and Sciences; and the studios of WYSU, the University's FM stereo radio station.

THE LINCOLN PROJECT

A recent addition to the Youngstown State University physical plant is the $1.62-million Lincoln Project, located on the southeast corner of Lincoln and Phelps avenues. Of strikingly contemporary architecture, the structure contains some 59,000 square feet of floor space. It houses the School of Business Administration and the offices of the Graduate School, the Department of Sociology and Anthropology, and Campus Planning.

BEEGHLY PHYSICAL EDUCATION CENTER

The newest of the University's major structures, this building was completed early in 1972. It contains some 198,000 square feet of floor space and houses 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.

THE ALUMNI OFFICE

An up-to-date record of the more than 20,000 graduates is maintained by the Alumni Office. As far as possible, the graduate's record shows his place of employment, the type of work he is doing, and the advanced degrees he has earned, as well as other information. The Alumni Office is located in the Executive Office Building.

The Youngtown State University Alumni Association is the official organization of the institution's alumni. Membership in it is extended to all graduates of the University.

LABORATORIES

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

The *biological sciences* laboratories are equipped with modern instruments necessary for the study of cell biology, ecology, microbiology, molecular biology and physiology. A reference collection of nearly 7,000 native and exotic plants is available for student use, and the department has an extensive

collection of mounted insects. Liquid scintillation counting, autoradiography and other techniques are applied for studies involving radioactive isotopes. Field studies are carried out at the YSU Arboretum, Mill Creek Park, and the Meander Creek Reservoir.

The *chemistry* laboratories have equipment for a range of experiments in all major areas of chemistry. The wide scope of instructional and research instrumentation allows students to learn current and significant methods and includes capabilities in nuclear magnetic resonance, spectrometry, mass spectrometry, infrared, visible and ultraviolet spectrophotometry, gas chromatography, X-ray diffraction, electrochemistry, and radioisotope techniques.

The *general geology* laboratories are equipped to familiarize the student with common rocks, minerals, and fossils. Aerial photographs and topographic and geologic maps are utilized in the study of landforms and geologic structures of various localities.

The *mineralogy-petrology* laboratory is reserved for juniors and seniors who are pursuing advanced studies of the chemical and optical properties of minerals and rocks.

The *advanced geology* laboratory is equipped with research instrumentation to teach the techniques and applications of mass spectrometry, X-ray diffraction and differential thermal analysis as applied to geologic problems plus a specialized research microscope designed for the study of metallic ores and coal petrography.

The *language* laboratories are equipped with two consoles and sixty student carrels, each containing a tape deck and headphones. Various programs may be sent out to the carrels from a console's tape decks or record turntable. Student responses may be monitored and recorded at the consoles. Students employing the lab facilities have at their disposal many language tapes to play at the carrels for audio-oral practice. Tapes containing drill material coordinated with classroom texts are available as well as foreign music, literature, and cultural material.

The *general physics* laboratories are fully equipped for college-level experiments. The equipment consists of a few pieces of many types of apparatus rather than of many pieces of a few types. Such a distribution makes possible a year-to-year flexibility in the program for freshman and sophomore physics students. The experimental work in the general physics laboratories is designed to reinforce the classroom emphasis on the concepts, ideas, and laws of physics.

The *advanced physics* laboratories, adjacent to the general physics laboratories, are reserved for the more difficult experimental work required of junior and senior physics majors. The work in these laboratories is designed to emphasize experimental techniques and precise measurement of physical quantities.

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 Bella 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; Campbell Stadium; Stambaugh Field, the gift of Mr. Arnold Stambaugh, for practice; municipal tennis courts; Mill Creek sports fields, and the Avalon Golf Course.

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 works in inexpensive editions. Should a selection not be available, the Bookstore will order it upon a suitable down payment. There are other stores in the Youngstown area servicing the University that will add variety to available material. While the Youngstown State University Bookstore does not attempt to compete with these stores, it does carry a selection of personalized soft goods, gifts, and specialty items. The aims of the Youngstown State University Bookstore are predicated on service to students, faculty and staff.

PARKING AREAS

Parking facilities for students include a parking deck between Lincoln and Arlington streets, and a large open lot between Arlington and Spring streets. Other major lots are

located on the north side of Grant Street behind the Physical Education Center, across from Jones Hall on Wick Avenue, and on the west side of Wick Avenue at the expressway ramp. There is a total of ten lots available for students. Please consult the map for locations.

Parking facilities for University employees are so marked.

Between 5:30 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 catalog.)

NEIGHBORING FACILITIES

A number of community facilities have been made available for University use. Mill Creek Park is exceptionally favorable for biological study; and through the social agencies of the city, sociology students may do practical social work. Several rooms in the Youngstown Board of Education building are used for classrooms. Continuous or occasional use is also made of various other facilities of such agencies as the City of Youngstown, the Youngstown Board of Education, the Mahoning Chapter of the American Red Cross, the Mahoning County Tuberculosis and Health Association, the Board of Park Commissioners of the Youngstown Township Park District, the Girard Board of Education, the Public Library of Youngstown and Mahoning County, the Butler Institute of American Art, Stambaugh Auditorium, St. John's Episcopal Church, First Christian Church, Newman Center and First Presbyterian Church. Reciprocal agreements for the use of certain equipment are in effect with the Public Library.

Youngstown State University is grateful to these and other agencies for their generosity and helpfulness in meeting a community need. This cooperation engenders a favorable atmosphere in which to carry forward the program of the University.

STUDENT PERSONNEL SERVICES

OFFICE OF THE DEAN OF STUDENT AFFAIRS

The basic responsibility of the Dean of Student Affairs is to provide leadership in all areas of the University which influence the welfare of the student. Specifically, he is charged with the administration and coordination of student personnel services in all divisions of the University.

Included in these services are educational, vocational, and personal counseling programs; standardized testing programs and services; advisement of fraternities and sororities; student housing; placement service; and coordination of social, recreational, and cultural extra-curricular activities. Other offices involved in providing these services and directly responsible to the Dean of Student Affairs include the Assistant Deans of Student Affairs, Director of Student Activities, University Counseling Center, International Student Office, Career Planning and Placement Service, and Health Service.

Under the Youngstown State University Code of Student Rights, Responsibilities, and Conduct, the Dean of Student Affairs is charged with primary responsibility for student conduct and discipline at the University.

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.

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 Admission Test for Graduate Study in Business. 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.

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 himself 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.

INTERNATIONAL STUDENTS

The International Student is a welcome member of the Youngstown State University community. His contribution to the University community is to enrich and to share with others knowledge, understanding, and appreciation of his culture.

It is expected that an International Student will have attained a certain degree of proficiency in the use of English at the time he arrives on the campus, so that he will be able to engage in academic endeavor with benefit to himself. The University affords its International Students the same opportunity to be participants in University affairs as all other students.

A full-time advisor to International Students is available to provide assistance and counsel to all who come to our campus from other lands. Each student is provided guidance and direction in as many areas as possible in order that he may derive the greatest profit and personal satisfaction from his stay at Youngstown State University. All International Students should make an appointment to meet with the advisor as soon as possible after their arrival in Youngstown.

Citizens of the United States who wish to study abroad also may seek advice from the International Students Office.

Students from abroad, whether initial or transfer students, are governed by the directives contained in the brochure entitled "Information for Prospective International Students."

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. The cost of the service is included in the general fee; 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 twenty-four 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. The program is underwritten by the Continental Casualty Company of Chicago, Illinois, and administered by the McElroy-Minister Company of Columbus, Ohio. 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.

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 all graduating students and alumni seeking permanent 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. 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 two hundred 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 Assistant Dean of Student Affairs.

Off-Campus Housing — The University provides a list of approved off-campus

housing for men and women. The housing has been inspected and has met minimum University standards. The University does not place students in off-campus housing; therefore, personal arrangements must be made for these facilities. Only those facilities which appear on the University's approved housing lists are recommended.

FOOD SERVICE

Any student not residing in Kilcawley Men's Residence Hall may purchase a meal ticket on a quarterly basis. Arrangements may be made through the Office of the Assistant to the Vice President for Financial Affairs. The cafeteria in Kilcawley Center also serves meals and light lunches a la carte.

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

The University encourages student participation in extracurricular activities. While studies are of primary concern, an extensive program of extracurricular activities is available to assist students in developing leadership, initiative, personal interest, and skills. A varied social and cultural program, including recognized musical groups, performers, lecturers, and dramatic groups, is available to students attending Youngstown State University. Social fraternities and sororities, honor societies, service groups, and special interest clubs offer additional opportunities for social and intellectual growth.

The Director of Student Activities is located in Kilcawley Hall and is readily available to individual students as well as to organized student groups. He is responsible for the development and direction of all student activity programs and for ensuring that these programs remain responsive to the needs and desires of students.

HONOR POINT SYSTEM

The Honor Point System recognizes achievement in extracurricular activities and scholarship. Each year five graduates having the most points receive YSU pins (see *Awards and Prizes*).

In evaluating academic achievement for this purpose, each credit hour with an A grade is worth 1 point and each hour of B is worth ½ point. The point schedule for extracurricular activities is available at the office of the Dean of Student Affairs. Extracurricular points are counted only up to the number matched by earned academic points, and academic points only up to the number matched by earned extracurricular points.

STUDENT GOVERNMENT

The student body of Youngstown State University is represented by the Student Government, which operates under constitutional powers granted by the University. A 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 Dana School of Music, and the Technical and Community College, 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 charter all student organizations, to conduct student elections, to hear appeals from groups or individuals, to appoint student members of joint faculty-student committees, and to supervise programs financed from its operating budget.

The financial support for activities sponsored by Student Council is a portion of the General Fee included in students' billing. The funds from this fee allocated to Student Council activities is administered by the Student Council Budget Committee. The faculty-student committee determines financial policies and approves the budgets, which are proposed by the Student Government treasurer and recommended to the committee by Student Council.

Operating budget allocation funds for student art shows, debates, dramatic productions, intramural athletics, music organizations, other cultural, social, and recreational

programs are administered by the groups to whom the funds are allocated. Student Council allocates and administers the funds for Student Government expenses, such as the "Student Handbook," student body social functions, cheerleaders, Honors Day and special projects recommended and approved by members of Student Council.

KILCAWLEY CENTER

Kilcawley Center reflects a meaningful commitment to students in its governance, operations, and programming. The philosophy of the Center reflects a belief in student involvement and control as the means for serving the student interest.

The policy-making body of the Center, the Kilcawley Center Governing Board, consists of fifteen voting members—eight undergraduate students, one graduate student, three faculty members, two administrators, and an alumnus. The director of Kilcawley Center is a non-voting *ex-officio* member. The Board is charged with the responsibility of creating policy to provide a comprehensive social, cultural, and recreational program for the Center.

Students are also prominent in the day-to-day operation of the Center, and comprise approximately 80% of the staff. They work in diverse areas, with six students acting as supervisors in the Center.

The Kilcawley Center Program Board supplies another avenue for student involvement in the Center. The Program Board consists of several committees designed to bring a variety of programs to the Center. Students serve on these committees, which work in the areas of video taping, films, recreation, art selection, performing arts, entertainment and lectures.

STUDENT PUBLICATIONS

All student publications of the University are under the supervision of the University Publications Board, 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.

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 University's intercollegiate debate team participates in over 20 multi-school tournaments each season, including those at Northwestern, Ohio State, Marietta, Loyola, Michigan, Wayne State, and Ohio University. Competitive debating is carried on in both novice and varsity levels on the current national intercollegiate debate topic.

The individual events team also participates in a multitude of tournaments including Kent State, Ohio University, and Miami. Competition involves several events such as oratory, extemporaneous, dramatic interpretation, and radio announcing.

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 three or four major productions each academic year. Each production is under the supervision of the faculty of the Speech and Dramatics Department. Recent productions have included, *A Clearing in the Woods, Mary Stuart, A Thousand Clowns, Camino Real, Madwoman of Chaillot, The Lower Depths, The Time of Your Life, The House of Blue Leaves, The Devil's Disciple,* and *Six Characters in Search of an Author.*

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 contributions to world culture. Salutes thus far have been made to France, Great Britain, and Italy. A special week-long program called Theatre YSU—the format of which varies from year to year—is sponsored each spring.

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 the Spotlight Theatre, a portable flexible arena theatre which is set up for each production in Strouss Auditorium.

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, including a purchase prize given annually by Student Council to the winner in any medium.

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.

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 twelve 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 the Arts and Sciences Office Building. The primary purpose of the station is to serve the cultural and educational interests and 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. The core of the station is a full-time professional staff, but the station does employ part-time students who have the qualifications and competence to meet professional broadcasting standards.

FM-SCA PROGRAMS

The University transmits special educational programs for classroom instruction, for the handicapped, for selected professional and special interest groups on a multiplex basis using a subcarrier frequency of 67 kilohertz.

TV PROGRAMS

The University is a member of NETO (Northeastern Educational Television of Ohio), an ETV consortium of Akron, Kent, and Youngstown universities which operates UHF Channel 45. The transmitter for the station is located at Salem.

While the common transmitter broadcasts non-local programs acquired from national educational television sources and the Ohio Educational Television Network, all locally produced programs are or will be produced at existing and planned production centers at Akron, Kent, and Youngstown.

Most of the television programming during school-day hours is for the 460,000 elementary and secondary school students in the eight-county area served by Channel 45.

CARRIER CURRENT RADIO

The University also operates an on-campus carrier current radio station which is housed in the Kilcawley Center. The student-operated station features programs designed, produced, and conducted by students especially for student listening in the residence hall and elsewhere on campus. Music, important campus events, news, remote pickups, and simulcasts with WYSU-FM are featured. The carrier-current station serves as a laboratory for the training of students enrolled in the broadcast curriculum of the Department of Speech and Dramatics.

INTERCOLLEGIATE ACTIVITIES

Intercollegiate athletics are conducted at Youngstown State University to enlist the interest of the entire student body in health-

ful 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, and volleyball.

The University is a member of the Lake Erie Intercollegiate Rifle Association, Midwest Association for Intercollegiate Athletics for Women, National Collegiate Athletic Association, National Rifle Association, Ohio Association for Intercollegiate Sports for Women, and Penn-Ohio (Swimming) Conference.

UNIVERSITY-RECOGNIZED STUDENT ORGANIZATIONS

Youngstown State University has over 100 student organizations established on its campus, representing almost every possible area of social, recreational, or professional interest.

Each one must be chartered by Student Council and have at least one faculty or staff advisor appointed by the President of the University. A copy of the organizational constitution must be placed on file with the Student Activities Office.

In addition, the organization must file an "Application for University Recognition" at the beginning of the fall quarter of each academic year with the Student Activities Office. The names of officers and advisors and signatures of the president and faculty advisor of the organization are required on the application.

Student organizations which satisfy the above requirements are entitled to use the name of the University in the conduct of organization activities, to participate fully in University and Student Government-sponsored programs and activities, and may be granted use of University facilities according to the classification and priority listed in the Student Handbook.

An organization may sever its affiliation with the University at any time by submitting a letter stating its intent to do so to both the Student Council and Sudent Activies Office, or by failing to submit the annual "Application for University Recognition" at the beginning of an academic year.

An organization which declines to continue its affiliation with the University under the terms of these regulations will be responsible only to its own membership and/or national organization and will have no continuing responsibility to the University for adherence to University policies and regulations. Neither will they have the privilege of using the University facilities or participating in University-sponsored activities (e.g., intramural athletics, campus queen elections, and homecoming and major weekend activities). In the case of national chartered organizations, the University is obligated to inform the national office whenever a change of status of the local chapter or group occurs.

HONORARY SOCIETIES

Alpha Mu is a local honorary advertising, merchandising, and public relations fraternity.

Alpha Psi Omega is a national honorary fraternity for students of dramatics.

Alpha Tau Gamma is a local honorary accounting fraternity.

The Clarence P. Gould Society, named for the emeritus chairman of the Department of History, is a local honorary group designed to recognize and encourage outstanding academic achievement in the College of Arts and Sciences. Membership in the Gould Society is confined to graduating students (with the exception noted below), who are elected on the following basis:

The student shall be a candidate for and shall have fulfilled all the requirements for the Bachelor of Arts or the Bachelor of Science degree with a major in one of the three divisions of the College of Arts and Sciences.

He shall be in the upper five per cent of his class at graduation and shall have a cumulative point average of at least 3.50, based on all his academic college work.

He shall have better than a *C* average in the required courses in each of the three divisions of the College of Arts and Sciences. (A lower average in any division may be raised, for this purpose, by taking additional courses in that division.)

The student shall be elected by a faculty

committee after consideration of his character and his complete academic record. At the discretion of this committee, a student may be elected during the year preceding the completion of his work.

Kappa Delta Pi is an honorary society in education. Membership is by invitation and is restricted to junior, senior, and post-graduate students who plan to teach and whose grades place them in the upper quintile of the University.

Omicron Delta Epsilon is a national honorary society for economics majors.

Omicron Lambda is an honorary fraternity of outstanding biology students. It strives to promote life sciences, and to achieve this goal the members serve as judges of high school science fairs, participants in science open houses, and as lecturers to high school classes.

The National Society of Pershing Rifles, an honorary military society, was organized in 1894 by Gen. John J. Pershing, then a 2nd lieutenant instructor at the University of Nebraska. Membership is drawn from the Basic Course students except for officers of the organization, who are Advanced Course students. The unit at Youngstown State University, organized in 1952, is Company P, First Regiment. One of the primary objectives of the organization is excellence in close order and exhibition drill. A few of the activities that the unit participates in are:

(a) platoon, squad, and individual drill competition with other colleges and universities in Ohio, Kentucky, and West Virginia.

(b) parades, civic and University functions.

(c) Honor Guards

(d) Social affairs

The National Society of Scabbard and Blade is an honorary military science organization. Membership is by invitation and is restricted to cadets enrolled in the advanced R.O.T.C. course. The society, believing that military service is an obligation of citizenship, has as its purposes the development of the essential qualities that make for good and efficient officers and the dissemination of intelligent information concerning the military requirements of our country. Company B, 15th Regiment, is established at Youngstown State University.

Phi Kappa Phi is a national honor society, founded in 1897, open to honor students from all departments of American universities and colleges. The objectives of the organization are to promote the love of learning, to foster understanding and respect among the various academic disciplines, and to recognize superior scholarship.

Members are elected by the Youngstown State University chapter each spring, from candidates of good character with the following qualifications: the undergraduate student must have been in full-time attendance for at least one year at Youngstown State University, must have at least half of his credit at this University, must have senior standing with at least a 3.5 grade-point average; the graduate student must be in the top ten percent of his graduate division, and must have completed at least 36 hours of graduate credit at this University with a minimum point average of 3.7. No more than five percent of the graduating class or ten percent of the number in any school or college may be elected in a year. The chapter on occasion elects alumni of outstanding achievement since graduation.

Tau Beta Pi is a national honorary fraternity for engineering students.

The University Hill Chapter of the Future Secretaries Association is an honorary organization for secretarial majors. It is sponsored by the National Secretaries Association.

PROFESSIONAL ORGANIZATIONS

Alpha Delta Sigma is a national professional advertising fraternity.

Alpha Kappa Psi is a national business administration fraternity.

Delta Nu Alpha is a national professional transportation fraternity for students in the School of Business Administration.

Lambda Tau is a national organization for students in medical technology.

The Reserve Officers' Association promotes interest in the advanced R.O.T.C. course and an awareness of the role of the citizen-reservist. Membership is open to all R.O.T.C. cadets.

Phi Mu Alpha Sinfonia Fraternity of America is a national professional music fraternity, Delta Eta chapter of which is at the Dana School of Music.

The objectives of the R.O.T.C. Rangers Program are to promote the development of cadet leadership and provide realistic field training in Ranger-type operations. Membership is open to all students in "good standing." Training consists of map and compass usage, survival, mountain rapelling and rope crossings, first aid, climatic conditioning, tactics, and is conducted in the Allegheny National Forest, Pennsylvania, and various Ohio state parks.

The mission of the ranger program is accomplished by (a) developing the leadership traits of its cadet members, (b) instilling self-discipline, determination, resourcefulness, and self-confidence in each cadet to increase his effectiveness as a future leader, whether it be as a civilian or as a soldier, (c) provide realistic training associated with Ranger-type operations, and (d) develop interest in and respect for a career in the profession of arms through activity and instruction not available as part of the regular military science curriculum.

Sigma Alpha Iota International Professional Music Fraternity for Women, Alpha Nu chapter, is open to students of the Dana School of Music.

The Student Chapter of the American Institute of Electrical Engineers is a technical society affiliated with the national A.I.E.E.

The Youngstown State University Chapter of the American Chemical Society, Student Affiliates, is made up of students interested in any phase of chemistry.

The Youngstown State University Chapter of the American Society of Civil Engineers encourages the development of a professional consciousness and individual ideas through an association with active leaders in civil engineering.

The Youngstown State University Chapter of the American Society for Mechanical Engineers has as its purpose the dissemination of knowledge of mechanical engineering and the furtherance of the professional development of the student members.

The Youngstown State University Chapter of the American Society for Metals, Student Affiliates, is open to students interested in the manufacture and treatment of metals.

The Youngstown State University Society of Chemical Engineers seeks to promote more active cooperation among chemical engineering students, to improve scholarship, and to encourage professional development.

The Youngstown State University Society of Industrial Engineers aims to foster a high degree of integrity among the future members of the industrial engineering profession.

The Youngstown State University Student Chapter of the Ohio Society of Professional Engineers is open to all engineering students in good standing, except freshmen. The society's aim is the preservation of ethical and professional standards in its field.

RELIGIOUS ORGANIZATIONS

Campus Crusade for Christ
Cooperative Campus Ministry
Inter-Varsity Christian Fellowship
Jewish Student Fellowship
Newman Student Organization

GOVERNMENTAL ORGANIZATIONS

Student Government
Student Council
Dean's Council, the William Rayen School of Engineering
Inter-Fraternity Council
Panhellenic Council

SOCIAL FRATERNITIES

Alpha Phi Delta
Delta Chi
Delta Sigma Phi
Kappa Alpha Psi
Kappa Sigma
Phi Delta Theta (Colony)
Phi Kappa Tau
Phi Sigma Kappa
Sigma Alpha Epsilon
Sigma Alpha Mu
Sigma Phi Epsilon
Sigma Pi
Sigma Tau Gamma
Tau Kappa Epsilon
Theta Chi
Theta Xi
Zeta Beta Tau

SOCIAL SORORITIES

Alpha Kappa Alpha
Alpha Omicron Pi
Alpha Sigma Tau
Delta Zeta
Delta Sigma Theta
Phi Mu
Sigma Sigma Sigma
Zeta Tau Alpha

SERVICE ORGANIZATIONS

Alpha Phi Omega
Circle K
Gamma Sigma Sigma

OTHER STUDENT ORGANIZATIONS

African-American Student Union
Alpha Delta Omicron
American Institute of Biological Sciences
Campus Ecology Group
Champagne Corps (ROTC)
Chess Association
Community of Concern
Cosmos and Chronos
History Club
International Student Organization
Kappa Kittens
Les Bon Vivants
Little Sisters of Alpha Phi Delta
Little Sisters of Alpha Phi Omega
Little Sisters of Athena
Little Sisters of Delta Chi
Little Sisters of Delta Sigma Phi
Little Sisters of Minerva
Little Sisters of Theta Chi
Little Sisters of the Triple T
Little Sisters of White Carnation
Little Sisters of White Rose
Little Sisters of the Laurel
Los Buenos Vecinos
Men's HPE Majors Club
Music Educators National Conference
Organization of Arab Students
Order of Diana
Penguin Review Club
Pearls of the Octagon
Phi Lambda Pi
Psychology Student League
Russian Club
Sigma Pi Sigma
Sisters of the Golden Heart
Society of Physics
Student Arts Association
Student Guild of American Guild of Organists
Student International Meditation Society
Student National Education Association
Student Nurses Association
Student Rights Organization
Student Volunteer Bureau
Wilma Browne Home Economics Association

*Men Only.

YSU Amateur Radio Club
YSU Flying Club
YSU Geological Society
YSU Italian Club
YSU Jazz Ensemble I and II
YSU Liberterian Society
YSU Math Club
YSU Philiatric Society
YSU Pre-Law Association
YSU Rifle Club
YSU Sailing Club
YSU Track Club
YSU Volleyball Club
YSU Veterans Association
YSU Young Democrats
YSU Young Republicans

INTER-FRATERNITY COUNCIL AND PANHELLENIC COUNCIL

Inter-Fraternity Council is made up of one representative and one alternate from each active social fraternity. The Council governs the relations of such fraternities among themselves and with other groups. It has two faculty advisors, appointed by the President of the University.

Panhellenic Council is made up of three representatives from each active social sorority and has a faculty advisor appointed by the President of the University. The Council supervises the relations of such sororities among themselves and with other groups.

AWARDS AND PRIZES

The winners of the following awards are announced at the Honors Day exercise, or at the end of the academic year:

The YSU Pin. Youngstown State University annually awards five pins to those graduating students who have the largest number of honor points in scholastic and extracurricular activities.

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 extracurricular activity through four years of college: $200.

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

The Distinguished Military Graduate Honor Award. Each year the President of Youngstown State University designates distinguished military graduates from the recommended distinguished students in military science who have maintained required standards in the R.O.T.C. and in the University during their senior year.

The Alpha Kappa Psi Key. Eta Xi chapter of Alpha Kappa Psi, a national professional business fraternity, awards annually the Alpha Kappa Psi Scholarship Key to the male senior student pursuing a degree in the School of Business Administration, who has the highest scholastic average.

The Alpha Tau Gamma Fraternity Award. The Alpha Tau Gamma honorary accounting fraternity gives an annual award 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 Chemical Society Student Affiliates Award. The Youngstown State University Chapter of Student Affiliates of the American Chemical Society annually presents a copy of Van Nostrand's *Chemists' Dictionary* or another suitable book to a graduating senior. The recipient must be an active member of the Chapter, must have the highest cumulative point average in chemistry and chemical engineering courses numbered 600 or higher, and must have been a full-time student at Youngstown State University for at least three consecutive years.

The American Institute of Biological Sciences, University Chapter (AIBS), presents an award to the outstanding freshman in biological sciences.

The American Institute of Chemists Award. A medal and an associate membership in the American Institute of Chemists, for a period of a year, is awarded to a senior chemistry student outstanding in scholarship, leadership, and character.

The American Institute of Electrical Engineers, Sharon Section, Award in Electrical Engineering. The American Institute of Electrical Engineers, Sharon Section, grants an annual award to the outstanding graduate in electrical engineering.

The American Institute of Industrial Engineers Award in Industrial Engineering. The American Institute of Industrial Engineers gives an award to the graduating industrial engineering student of Youngstown State University having the highest scholastic record. This is known as the "A.I.I.E. Award" and is presented at the May meeting of the Youngstown Chapter of the American Institute of Industrial Engineers.

The American Production and Inventory Control Society Award. The American Production and Inventory Control Society presents an award to the graduating senior in the School of Business Administration completing his courses in management with the highest point average.

The American Society of Civil Engineers, Youngstown Branch, Award in Civil Engineering. The American Society of Civil Engineers, Youngstown Branch, grants an annual award to the outstanding graduate in civil engineering.

The American Society of Civil Engineers, Youngstown Branch, Award in Civil Engineering Technology. The American Society of Civil Engineers, Youngstown Branch, grants an annual award to the outstanding graduate in civil engineering technology.

The American Society of Mechanical Engineers, Youngstown Section, Awards in Mechanical Engineering. The American Society of Mechanical Engineers, Youngstown Section, grants an annual award to the otustanding graduate in mechanical engineering.

The American Society of Metals Awards. The American Society of Metals, YSU Committee, grants awards to an outstanding senior and an outstanding junior in metallurgical engineering and materials science, and to an outstanding student for leadership in ASM activities.

B'nai B'rith Undergraduate History Award. The Youngstown Chapter of B'nai B'rith grants an award of $50 annually to the undergraduate history student with the highest point average.

B'nai B'rith Graduate History Award. The Youngstown Chapter of B'nai B'rith grants an award of $50 annually to the outstanding graduate history student.

The Bronze Medal. The Bronze Medal of the American Association of Teachers of Spanish and Portuguese is given to the best

student in two or more years of Spanish by Los Buenos Vecinos, the Youngstown State University Spanish Club.

Los Buenos Vecinos Art Award. Los Buenos Vecinos, the Youngstown State University Spanish Club, gives a prize of $10 for the best drawing shown at the annual Youngstown State University Art Exhibition.

The Frieda F. Chapman Award. The William Holmes McGuffey Chapter of the National Student Education Association annually presents an award to a senior who gives evidence of becoming an outstanding elementary school teacher.

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

The Frank M. Clark Memorial Award. An award is presented annually to the graduating senior in physics who has the highest cumulative point index and who has been admitted to graduate study. The award is made to honor the memory of Frank M. Clark, associate professor of physics, who taught at the University from 1957 until his death in 1965.

The Clothes Tree Art Award. The Clothes Tree, Inc., annually awards a prize for meritorious work in any art medium.

The Louis A. Deesz Memorial Award. The Mahoning Valley Chapter of the Ohio Society of Professional and Registered Engineers, Tri-County Section, gives an annual award to the graduating engineering student outstanding in academic achievement and personality. The award is made in honor of the memory of Louis A. Deesz, the first Dean of the William Rayen School of Engineering.

Department of History—Chairman's Award. An annual award of $25 given by the Chairman of the Department of History for the best undergraduate research paper in any field of history.

The Evangelos Meshel Memorial Award in Greek. The family of Evangelos Meshel offers an award for the best student in elementary ancient Greek. The winner must have earned at least B in the course. In the absence of a deserving recipient in elementary Greek, the award may be given for excellence in advanced Greek.

The Inter-Fraternity Council Scholarship Award. The Inter-Fraternity Council annually awards a plaque to the fraternity with the highest aggregate point index, based on the academic work of the previous three quarters. The award is presented at the Greek Sing at Stambaugh Auditorium.

The Kappa Delta Pi Award. The Kappa Delta Pi honorary education society gives an annual award to a member of the society who is a senior and who exhibits outstanding scholarship, leadership, and character.

The Mahoning Valley Chapter of the Ohio Society of Certified Public Accountants Award. The Mahoning Valley Chapter of The Ohio Society of Certified Public Accountants annually presents an award to the student selected by its board of directors as the outstanding participant in the accounting internship program.

The McKelvey Award in Retail Merchandising. The G. M. McKelvey Company gives an annual award to the graduate in retail merchandising with the highest point average in all courses taken by the student, with consideration given to his achievements in any merchandising firm. Candidates are recommended by the faculty of the Department of Merchandising; final choice is made by the Chairman of the Department of Marketing and the Dean of the School of Business Administration.

The Mosure-Fok and Syrakis Company, Limited, Award in Civil Engineering Technology. The Mosure-Fok and Syrakis Company, Limited, grants an annual award to the graduate in civil engineering technology who is deemed by the faculty to represent the best overall graduate completing his degree on a part-time basis while employed on a full-time basis. Such award recognizes the diligence of students with economic responsibilities who yet complete their formal education requirements for graduation.

The National Association of Accountants Award. The National Association of Accountants gives an award each year to the graduating senior with the highest point average in accounting.

The Omicron Lambda Honorary Biology Fraternity Award for Scholarship. Omicron Lambda fraternity annually presents a $25 cash award to an outstanding graduating biology student who has distinguished himself scholastically and in extracurricular activities. This distinguished student is

generally an active member of Omicron Lambda, but membership is not a necessary criterion of selection. The name of the recipient of the cash award is inscribed on a permanent plaque located in the Biology Department.

The Panhellenic Council Award. A silver tray is awarded yearly by Panhellenic Council to the sorority that has the highest aggregate point index, based on the academic work of the previous year. The award is presented at the Greek Sing held at Stambaugh Auditorium.

The Sigma Tau Fraternity Engineering Award. The Sigma Tau honorary engineering fraternity annually presents an award to the freshman in the Engineering School whose record is most outstanding.

The Student Council Purchase Prize. Youngstown State University Student Council offers a purchase prize of $100 to the winner in any medium at the annual Youngstown State University Art Exhibition.

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

The Von Steuben Medal. The Von Steuben Society of America annually awards a silver medal to a German major who has excelled in his study of the German language and literature.

The Peter I. Wenzen Award. The Youngstown State University Geological Society and friends give an annual cash award in honor of Mr. Peter I. Wenzen. The recipient is a junior or senior majoring in geology who is in need of financial assistance.

The George M. Wilcox Award. The William Holmes McGuffey Chapter of the National Student Education Association annually presents an award to a senior who gives evidence of becoming an outstanding high school teacher.

The Wolves Club Awards in Advanced Latin. The Wolves Club, Den No. 6 of Youngstown, annually offers two awards for meritorious work in Latin on the upper-division level.

The Wolves Club Awards in Intermediate Latin. The Wolves Club, Den No. 6 of Youngstown, annually offers two awards for meritorious work in Latin on the intermediate level.

The Yo-Tub Men's Fraternity Prize. The Yo-Tub Men's Fraternity gives an annual award of $200 to a deserving son or daughter of an employee of the Youngstown Sheet and Tube Company.

The following awards are given to students enrolled in the R.O.T.C. program and are announced at the Honors Day exercise or at the end of the academic year:

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

The Association of the United States Army Medal. The Association of the United States Army awards a medal annually to the cadet completing the first year of the advanced course who is the most outstanding in all academic subjects (exclusive of military), in military science, and in personal qualifications, and who has completed one full year of the R.O.T.C. course at Youngstown State University.

The American Legion (Post 15) Awards. Military Excellence: Presented to a MS III and MS IV cadet who ranks in the top 25 per cent of his academic class and has demonstrated outstanding leadership traits.

Academic Excellence: Presented to a MS III and MS IV cadet who ranks in the top 10 per cent of his academic class and in the top 25 per cent of his ROTC class.

The Department of Army Superior Cadet Ribbon Award. This award is presented annually by the Department of the Army to the R.O.T.C. student in each academic class at Youngstown State University who is judged the outstanding student in his class in military science.

Daughters of the American Revolution Award. The Mahoning Chapter, Daughters of the American Revolution, annually awards a Gold Medal to the graduating cadet in the top 25 per cent of his R.O.T.C. and academic class who has demonstrated qualities of loyalty, good character, leadership and support of the R.O.T.C. program.

Daughters of Founders and Patriots of America (DFPA) Award. The Ohio Chapter of the Daughters of Founders and Patriots of America annually awards a Gold Medal to the sophomore cadet who is in the top 25 per cent of his class and who has

demonstrated a high degree of leadership and patriotism.

The Dean Gillespie Award. This award is presented annually to the ROTC senior who has most demonstrated all facets of leadership. The award is in honor of retired Dean of Men John Paul Gillespie.

The Mahoning Chapter, Reserve Officers Association, R.O.T.C. Honor Awards. The Mahoning Chapter, Reserve Officers Association, annually awards a medal to each of two R.O.T.C. cadets, as follows: to the cadet completing the basic course who is selected for and enrolls in the advanced course and who has best exhibited during his training at Youngstown State University the qualities of leadership; 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 has best exhibited during his training at Youngstown State University the qualities of leadership. Participation in extracurricular activities of the University for which honor points are awarded, as well as porformance as a cadet, is considered in making selections for these awards.

The Nathan Hale Chapter, Sons of the American Revolution Awards. The Nathan Hale Chapter, Sons of the American Revolution, annually awards a medal to each of two R.O.T.C. cadets, as follows: to the cadet who completes the basic course with the most outstanding excellence in all academic subjects (exclusive of military), in military science, and in leadership and character; and to the cadet who completes the advanced course with the most outstanding excellence in all academic subjects (exclusive of military), in military science, and in leadership and character.

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.

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 his 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 and enrolled students seeking financial assistance for the next academic year should apply prior to April 1. 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 equality in distribution of financial assistance awards based upon established financial need, the University utilizes the need analysis services of the College Scholarship Service. The parents or guardian of each applicant for financial assistance should submit a "Parents' Confidential Statement" form to the College Scholarship Service not later than April 1, or if the student applicant is completely independent of parental or guardian support, he should submit a "Student's Confidential Statement" form to the College Scholarship Service not later than April 1.

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 Student Loan Fund makes funds, not to exceed University fees for one quarter, available for not more than 30 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 he

begins repayment 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, usually 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.

Basic Educational Opportunity Grants 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 $1,400 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. Only students who will be attending school on a full-time basis qualify. The U.S. Office of Education has announced that only students starting post-secondary school educations after 1 April 1973 will be eligible for these awards for the 1974-75 academic year. 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.

The University administers 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 with the amount often dependent upon 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 he qualifies and need not designate the specific award(s) being sought.

ALCOA Foundation Scholarships. These $750 scholarships are awarded annually by the ALCOA Foundation to a junior or senior in electrical engineering and a junior or senior in mechanical engineering. Selection of recipients is made by the chairmen of the departments of Electrical Engineering and Mechanical Engineering respectively in coordination with the Director of Financial Aids, and are based upon financial need and academic excellence.

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 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.

American Paper Products Company Scholarship Plan. These four-year scholarships were established by the American Paper Products Company to aid their employees or employees' dependents securing education at YSU. One full-time scholarship for $500 is awarded annually to an entering freshman who is a three-year employee or a son or daughter of a three-year employee, retiree, or former employee who became deceased while associated with the firm. It is renewable for up to four academic years provided the student fulfills the requirements which govern the scholarship. In addition, one or more part-time scholarships may be awarded each academic year to entering freshmen, entering transfer students, or students already attending YSU.

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

Amerital Veterans and Civic Association Scholarship. This $300 scholarship established in 1970 by the Amerital Veterans and Civic Association is an annual award for a freshman male of paternal Italian descent living in the metropolitan Youngstown area in Ohio who needs financial assistance.

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 of $500, 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 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 General Motors College Scholarship. The General Motors Corporation, under its College Scholarship Plan, offers a four-year scholarship to an entering freshman selected on the basis of scholastic and leadership qualities and need for assistance. The scholarship covers tuition, fees, and supplies, with an additional amount if need is established.

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 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.

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.

Postal Church Service, Inc., Scholarship Plan. These four-year scholarships were established by Postal Church Service, Inc., to aid their employees or employees' dependents securing educations at YSU. One full-time scholarship for $500 is awarded annually to an entering freshman who is a three-year employee or a son or daughter of a three-year employee, retiree, or former employee who became deceased while associated with the firm. It is renewable for up to four academic years provided the student fulfills the requirements which govern the scholarship. In addition, one or more part-time scholarships may be awarded each academic year to entering freshmen, entering transfer students or students already attending YSU.

Army R.O.T.C. Scholarships. These scholships, 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 Sigma Alpha Iota Scholarship. The local alumni chapter of Sigma Alpha Iota Professional Music Fraternity for Women offers a $200 scholarship to a member of Alpha Nu, the local undergraduate chapter of the sorority. The recipient is chosen on the basis of musical ability, academic performance, financial need, and contribution to the fraternity.

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 of $300, established in 1961, are awarded to assist students of the Jewish faith who are attending the 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 upon his retirement 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 Alice W. Tod Scholarship. This scholarship is awarded by the Women's Board of the Youngstown Hospital Association to an upperclass student seeking a B.S. degree in the field of nursing. The selection of the candidate for the scholarship is based upon the recommendation of the Director of the Associate Degree Program and the Woman's Board of The Youngstown Hospital Association, in cooperation with the Director of Financial Aids at Youngstown State University. The awarding of the scholarship is based on academic excellence and is renewable for a second year provided the recipient maintains full-time student status and meets the established academic standards which govern the award.

The Women's Auxiliary of the Mahoning Valley Chapter of the Ohio Society of Professional Engineers Scholarship Grant. An annual grant of $100 is given to a deserving junior in the William Rayen School of Engineering by the Women's Auxiliary of the Mahoning Valley Chapter of the Ohio Society of Professional Engineers.

The Yo-Mah-O Chapter, National Secretaries Association Scholarship. This scholarship of $600 ($300 for each of two years) 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.

Youngstown Inner-City Student Scholarship Fund. This scholarship fund, established in 1971 by the Black Studies Program, is designed to assist minority students from the Youngstown inner-city schools who demonstrate ability to complete a college degree at Youngstown State University, but due to economic positions lack adequate financial support.

It is used to enable minority students to help themselves. Recipients of awards from this fund will be selected by the director of the Black Studies Program.

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 for three quarters of the academic year.

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 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 his 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 Dow Chemical Company Outstanding Junior Awards. The Dow Chemical Company annually awards $400 to an outstanding junior in each of the Departments of Chemical Engineering and Mechanical Engineering. The recommendations of the outstanding students are made by the academic departments.

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. The award is for University in-state tuition and fees for one academic year.

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 income from $5,000 to be awarded annually to a woman who is a full-time student in the secretarial department.

Hynes Steel Products Company 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 Anthony Ierino Scholarships. Two scholarships of $200 each are awarded annually to needy and worthy students. These scholarships were made possible by a bequest of Mr. Antonio Ierino in 1954 and are available to students of any class.

The William Jenkins Award. This award, made possible by a bequest of Alice W. Bergman, consists of the income from 100 shares of capital stock of the Peoples Bank of Youngstown and is available 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 1 to 3, according to qualifications of applicants.

The William F. Maag, Jr., Scholarship. This scholarship was established in 1947 in honor of Mr. 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 Mr. 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 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 of $12,000 contributed as a memorial to Tom Pemberton. The recipients must be in the upper two-thirds of their high school classes. The scholarships were established in 1957.

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 Mr. 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 several scholarships of $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. An endowment of $10,000 from the estate of Mrs. 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 aptitude and promise in the playing of the violin, and who is without sufficient means to provide himself or herself with an education and training in music.

The John R. Rowland English Scholarship. This scholarship, established in 1957, is awarded annually to an outstanding student majoring in English. The stipend is the income from the John R. Rowland Scholarship fund of $5,000.

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 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 awarded annually to a student of excellent character and scholarship who needs financial assistance. The stipend is the income from the Vail Scholarship Fund of $4,000 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 Scholarships. The income from an endowment of $40,000 from the estate of Miss Bessie Wilson is used for scholarships awarded to music students. These scholarships were established in 1957. Applications may be sent to the Dean of the Dana School of Music, who makes recommendations to the Committee on Scholarships.

The Isadore Zobel Scholarship. This scholarship, established in 1966 under the will of Mr. 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 Office of Student Financial Aids can arrange frequently for on-campus employment in such places as the cafeteria, residence hall, offices, library, and building and grounds maintenance. Off-campus employment can frequently be arranged by the YSU Placement Service.

GRADUATE SCHOLARSHIPS

The Graduate School of Youngstown State University makes available a certain number of assistantships and scholarships each year to graduate students enrolled in specific master's degree programs. For information on these appointments, consult the Graduate School Catalog or the office of the Dean of the Graduate School.

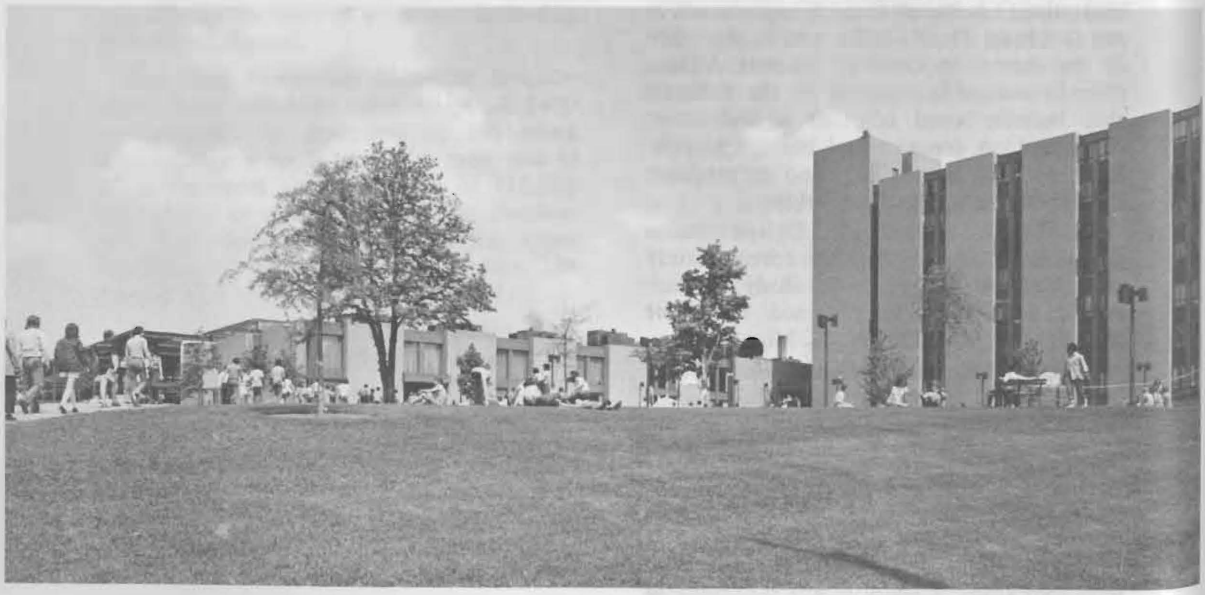
Many graduate scholarships, fellowships, and assistantships are available at other institutions. A file of these is maintained in the Graduate Dean's office and in the office of the Associate Dean of Student Affairs. Current notices are posted on the Scholarship bulletin board adjacent to the latter office and on departmental bulletin boards. Four of the more widely known graduate scholarships are described below:

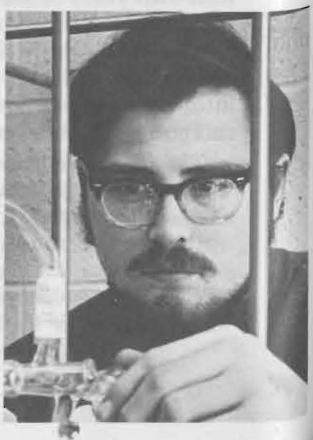
Fulbright Scholarships. United States government scholarships for foreign study are available for graduate study abroad. Applications may be obtained from the Fulbright advisor, Dr. W. L. Miner.

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.

Marshall Scholarships. These scholarships offer two years of study at any university in the United Kingdom. Applicants must be college graduates, citizens of the United States, and under 26 years of age. Further information may be obtained from the campus representative, Dr. W. L. Miner.

The Cecil Rhodes Scholarships. Men 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 1974	August 16, 1974	September 26, 1974
Winter 1975	November 26, 1974	January 6, 1975
Spring 1975	February 25, 1975	March 31, 1975
Summer 1975	May 20, 1975	June 18, 1975

Medical Report

Prospective students who are applying for admission to the University for the first time and who have been accepted are required to have a medical examination. A form will be supplied for this purpose. The form is to be completed by a qualified physician and returned to the Admissions Office as soon as possible. Accepted applicants must provide the medical report before they receive authorization to register.

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 guidelines shown below and information supplied on the "Application for Admission" form.

The resident or nonresident status of a student will generally remain the same throughout his attendance at the University although such status may be reviewed at any time.

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. Any student who registers improperly with respect to residence, will be required to pay the nonresident tuition surcharge. Retroactive refunds and charges may be made to any student improperly classified.

Resident Status Appeals

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 Nonresident Fee Exemption" available from that office. The Director's written decision will be sent to the student, who may appeal his classification in a personal interview with the Director of Admissions.

He also 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.

General Residency for Subsidy and 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 12 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 12 consecutive months preceding their enrollment in an institution of higher education and who are not receiving, and have not directly or indirectly received in the preceding 12 consecutive months, financial support from persons or entities who are not residents of Ohio for all other legal purposes.

3. Persons who reside 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 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 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 resident of Ohio who is enrolled in an institution of higher education when his or her parents or legal guardian remove their residency from the State of Ohio, shall be considered a resident of Ohio for these purposes during continuous full-time enrollment and until his or her completion of any one academic degree program.

6. Any person once classified as a nonresident, upon the completion of 12 consecutive months of residency in Ohio for all other legal purposes, may apply to the institution he or she attends for reclassification as a resident of Ohio for these purposes. Should such person present clear and convincing proof that no part of his or her financial support is or in the preceding 12 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.

7. 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.

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 and obtained a statement of high school equivalence. 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.

G.E.D.

Applicants who did not graduate from high school will be considered for admission if they have passed the test of General Education Development and been issued a high school equivalency certificate by a state department of education or the United States Armed Forces Institute.

Guidance and Counseling Tests

New freshmen (except those who have been out of high school two or more years) are required to take either the American College Test (ACT)* or the Scholastic Aptitude Test (SAT) as soon as possible. (Nursing applicants must take the ACT.) 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 high schools send to the Admissions Office

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

a record of all work completed. Partial transcripts will be given consideration for early decisions. If the applicant's record clearly indicates satisfactory completion, he will be notified of his acceptance 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 and obtained a statement of high school equivalence.

Out-of-State Residents

Residents from out of the State of Ohio must be ranked in the upper two-thirds of their class at graduation. Applicants who rank in the lower third of their high school class at graduation will not be admitted.

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.

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. (The requirement for the School of Education is 2.4 and the associate degree in nursing program is 2.5.) Those with less than a 2.0 or on probation may be considered for transfer on 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 occurred.

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 his degree from Youngstown State University he 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 his associate degree program, additional courses may be required before he achieves 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, he 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 he 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 he was suspended, or, in the event he wishes to change schools, by the dean of the school he wishes 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.

DEPARTMENT OF CONTINUING EDUCATION

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

VETERANS

Successful completion of courses taken through the United States Armed Forces Institute as well as certain formal service school courses may be considered for transfer toward the student's degree program. United States Armed Forces Institute courses must be evidenced by an official transcript and service school courses by certification of in-service training on DD Form 295—Application for the Evaluation of Educational Experiences During Military Service.

Veterans who have completed at least one full year of active 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—Armed Forces of the United States Report of Transfer or Discharge—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 provided that a grade of *C* or better is earned and the course is applicable to the student's degree program.

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 his test results merit. A student receiving a score of 3 or better 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

Any student entering Youngstown State University is entitled to a copy of the University catalog. This catalog shall be a guide to graduation requirements for that student. Any exceptions to requirements must be interpreted by the student's department chairman and/or the dean of the school from which he expects to graduate. 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]	—	—	—
Geometry[4]	1	1	—	1	1	1	—	—	—
Biology, chemistry, or physics[4]	1	1	—	1	—	1[6]	—	—	—
Any mathematics[4]	—	—	1	—	—	—	1	1	1[10]
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	6
Other subjects[7]	8—10	8—10	10	9	8	8[8]	10	10[9]	10
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	3[§]
Area									
Humanities	14	14	10[11]	8—18	8	8	8—18	10	—[‡]
Social Studies	20	20	20	16—22	20	16	16—22	20	9
Science/mathematics	16	Included in the major	16[13]	12—22	13	46	12—22	16	5[‡]
For the Degree[12]									
Foreign language[14]	8 or 20	4 or 16	—	—	—	—	—	—[15]	—
Other courses[16]	112 or 100	138 or 126	137	126—138	131—138	114	136	137	—[‡]
Total credit hours[17]	186	186	186—202	186—198	186-194	198	186—212	201	96[18‡]

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 Technical and Community College 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 he 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.

[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]The preferred mathematics courses are algebra and geometry and a unit of science. The preferred sciences for 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]Requirements peculiar to a particular degree are explained more fully in the section of this catalog primarily concerned with that degree.

[13]Candidates for the B.S. in Ed. in elementary education are required to take 12 hours of science (physical and biological) plus 9 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 Deparment of Education. Candidates for the B.S. in B.A. take Mathematics 542 as specified by the various curriculums.

[14]If this requirement is met with a language not previously studied, 20 quarter hours are needed. (See *Proficiency in a Foreign Language.*)

[15]For voice majors 24 hours are required. Part of this requirement may be met by 2 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).

[16]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.

[17]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.

[18]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 by Saturday noon of 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 he has filed a formal application, he must reactivate his application. The student must file the "Intention to Graduate" form with the dean of his school after the completion of 70 quarter hours for an associate degree and 165 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 his 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.

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 is considered to be a December graduate although he does not receive his diploma until March.

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 he is studying, as his high school preparation, even though satisfactory for his 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 he 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. The student must complete a major and at least one minor.

A departmental major consists of at least 45 quarter hours with grades of *C* or better in one department.* A combined major, for which the courses are in 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.

The chairman of the department the student is majoring in determines the course requirements for both the major and the minor or minors; both must meet with his approval. He may require the student to do more, but not less, than the minimums stated above. (The student might also want to consult with an advisor from the department he is minoring in.)

Departments may require all senior majors to take the Graduate Record Examination, and the score on the examination may be one factor in determining whether or not the student has completed the requirements for his major. (See *Special Fees*, at the end of this section.)

As soon as a student has decided on his major, he should consult the chairman of the department in which his major study will be done. While no student is compelled to declare his major before he files an "Intention to Graduate" form, in some departments it is essential that the planning be done not later than the beginning of the sophomore year, or in some cases earlier, to avoid 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

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

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 he has been accepted for further study at the professional school. He 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 of his choice.

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 his required course in English, he 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 military 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.

GENERAL COURSE REQUIREMENTS:

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 and Dramatics, 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.

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 9 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 Science in Applied Science are in the Technical and Community College section.

Those for the Bachelor of Science in Education 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 associate degrees are in the Technical and Community College section.

ASSOCIATE DEGREE REQUIREMENTS

For an associate degree, the requirements of each curriculum of the Technical and Community College must be fulfilled.

For these requirements, see the curriculums in the Technical and Community College section.

MODIFICATIONS FOR ROTC STUDENTS

ROTC 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

*Credit for 2-year program students not completing MS 500 and MS 600 level courses only.

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. DANA SCHOOL OF MUSIC
   - 3 ACTIVITY hours for Health and Physical Education
   - 7 q.h. Social Studies
   - 6 q.h. General Electives

6. TECHNICAL AND COMMUNITY COLLEGE (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.

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 that he had when he completed the requirements for the first degree, 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 he may earn a second major in a given degree subsequent to the time the degree was originally awarded.

A student who has 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 baccalaureate 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 his own curriculum suited to his 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 his selection. This committee will help him 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

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

Each student makes out his schedule of courses for the next quarter in consultation with a faculty advisor who must sign the student's advisement form. Instructions for advisement and registration are mailed from the Registrar's Office prior to registration.

A student planning his 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.

The advisement process is an attempt by the University to assist the student in meeting his degree requirements. *However,* the ultimate responsibility for meeting any requirements rests with the student himself.

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, in the *Schedule of Classes* for each specific quarter, and in the Directions for Registration received with the registration materials. Registration is not officially completed until all tuition and fees are paid.

EXTRA HOURS' 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. A brief description of the extra work must be given by the instructor.
3. Such extra work is done only under the supervision of a full-time instructor.
4. The extra credit may not exceed one hour for each course or one course each quarter.
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 student is enrolled.

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 his advisor to determine the number of hours available to him.

CLASS CLOSING

During the registration period many classes, especially in courses with several sections, are filled to capacity. These classes are called "closed," which means that *no more students will be admitted to them,* either during the registration period or after school begins. Faculty members may not admit to their classes students who are not officially registered for those classes. 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 his schedule must complete a Change of Registration form, have it signed by his advisor, present it with a properly completed Change of Registration Scan Sheet to the Registrar's Office, and pay any necessary fees.

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. There is no reduction of tuition or other fees because of late entrance into courses.

Withdrawal from a course must be accomplished through the Change of Registration procedure. A grade of *F* will be recorded unless a student officially withdraws in the above manner.

CANCELLATION OF REGISTRATION

A student who has not completed his registration by paying his tuition will have

his registration cancelled. He must, therefore, reapply for admission if he wishes to attend during a subsequent quarter.

COMPLETE WITHDRAWAL

A student who wishes to withdraw from all his classes in a particular quarter must follow the same procedure as in Change of Registration. He 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. He pays the regular fees, 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 unusual cases. In the event an advisor considers conference work essential, the student may apply to the dean of his school with the approval of the department concerned to arrange for a conference course. A Conference Course Request form may be secured from the Registrar's Office. Conference courses are open only to seniors with a 3.00 average or above and must be given by full-time instructors. Any exception must be approved by the dean of the school in which the student is enrolled.

CREDIT/NO CREDIT

A student may elect to register for a course on a *CR/NC* basis. (See *CR/NC* under Grading System below.) He must indicate his election of the *CR/NC* option at the time of registration, or within the time limits established for adding classes.

CREDIT BY EXAMINATION

Credit by examination may be granted, under special circumstances, to students who can demonstrate proficiency in certain subjects. The subjects in which examinations may be given and the nature of examinations are determined by the departments concerned and must be approved by the dean of the appropriate school and the Vice President for Academic Affairs. Registration for credit by examination can be done only prior to or during the first week of an academic quarter.

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 his 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 his total schedule for the quarter to exceed 16 quarter hours. Before registering for the courses, the student must have the approval of his advisor, the instructor of each course in which he wishes to enroll, and the Dean of the Graduate School. The credit earned cannot be counted toward fulfillment of the requirements for a bachelor's 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 his graduate work. The amount of such credit that will be acceptable at Youngstown State University is 15 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 an additional repetition is authorized by the student's academic dean. If the course repeated 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 form from the dean of the school in which he is 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, he may petition the dean of his school for a recalculation of his grade point average reflecting that repetition. Although courses are not deleted from a 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 his degree. A student holding the two-year associate degree may petition after receiving his associate degree only if he is 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 insure each student the right to an honorable and rewarding education, the University Discipline Committee attempts to discourage academic dishonesty, *e.g.*, cheating and plagiarism.

Though teachers 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 professor.

A teacher 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 the University Discipline Committee. In the event of an appeal, both the student and the teacher will be invited to appear before the Committee.

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 the Discipline Committee.

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 his own work to an instructor, is committing 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 own welfare he is expected to attend all class meetings of a course in which he 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 his 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 instructor, if he gives such consent, 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 instructor concerned which also indicates whether or not the above-mentioned fee is to be charged.

THE CLASS QUARTER, 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.

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. The slower student 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.

THE STUDENT LOAD

The courses taken by a student during any quarter constitute the *load* that he carries for that quarter. The load is measured in quarter hours. The size of the load a student is permitted to carry depends on the degree he is seeking (and hence on the curriculum he is following) and to some extent on his grade average, as follows:

a. A student following business administration, engineering, or music curriculum may carry as many hours as the curriculum requires, with the approval of the dean of his school. Such approval ordinarily is given.

b. All other students are governed by the following regulations:

1. A student with a point index of 3.0 or better may carry 18 quarter hours with his advisor's approval, which ordinarily is given.

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

†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.

2. No student may carry more than 18 quarter hours, and no student whose point index is below 3.0 may carry more than 16 quarter hours, unless his written request to do so is approved by his advisor and by the dean of his school.

3. In determining a student's quarter load, all courses are counted, whether they give credit toward graduation or not, except the general-requirement activity courses in health and physical education.

4. Any student may, with his advisor's approval, carry a course in military science in addition to the quarter load allowed him according to the preceding regulations.

FULL-TIME STATUS

A full-time student is one carrying 12 or more quarter hours in courses that give credit toward graduation.

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

COURSE NUMBERING SYSTEM AND ABBREVIATIONS

It is important that the student familiarize himself 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 abbreviations 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.

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.

Freshmen may not take an Upper Division course (except in a foreign language) without the approval of the Vice President for Academic Affairs unless it is prescribed in a curriculum.

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 his 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 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 his control and deemed justifiable by the teacher, has 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. 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 only at the end of the first and second quarters of certain approved courses with hyphenated numbers in which one project occupies the major work of three quarters, so that no judgment can be made at the end of the first or second quarters. This grade is changed at the end of the third quarter. It has no effect on the point average.

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 his 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.) Attendance is not required to achieve a grade of *AU.*

W represents a withdrawal properly processed during the first six weeks of any quarter (or first three weeks 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 teacher does not use the "curve" as a standard to be imposed, but only as a model against which he may compare each particular class, using his own judgment on the basis of professional standards.

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

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 6 courses for the baccalaureate degree or 3 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 he fails to do so, no record of his attempt will be entered on his transcript.

THE POINT AVERAGE AND SCHOLASTIC STANDING

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

For determining this, every grade has a point value for each quarter hour it represents, as follows: A, 4 quality points; B, 3 points; C, 2 points; D, 1 point; F, zero points. For example, an A in a 3-hour course is worth 12 quality points; a D in a 4-hour course, 4 points; and an F in any course, zero points. To find the point index, the total number of quality points earned is divided by the number of quarter hours for which final grades have been given. 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 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 his point average places him 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 his 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 of him 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 he has passed will be warned that he has dropped below the minimum grade for good standing. If by the end of the following quarter he has failed to bring his average up to the minimum, he will be put on probation. If at the end of the probationary quarter he has failed to bring his average up to the minimum, he will be suspended; however, if he makes substantial improvement during a probationary quarter and averages at least 2.25 for that quarter, he will be continued on probation even though his 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 his junior year) must have a point index of 2.50 or better; see the School of Education section.

EXCLUDING OLDER GRADES

A student may petition the dean of his school to exclude from the calculation of his 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 his 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 secured 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.

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 per cent 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 his 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. After determining that the student is academically and financially clear, the Recorder 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 new 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 his 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 General Assembly of the State of Ohio stipulates in the 1973-75 Appropriations Act (Amended Substitute House Bill No. 86) the following:

"In providing instructional and other services to students, boards of trustees of state-assisted institutions of higher education shall supplement state subsidies by income from charges to students. Each board shall establish the fees to be charged to all students including an instructional fee and a general fee for non-instructional services performed for the benefit of enrolled students. The board shall not authorize a waiver or nonpayment of instructional fees or of general fees for any particular student or class of students other than waivers specifically authorized by law. Each board shall establish special-purpose fees, service charges, and fines as required. A tuition surcharge is to be paid by all students who are not residents of Ohio."

The Board of Trustees of Youngstown State University has established the following fees for 1974-75*:

FOR FULL-TIME STUDENTS (12-17 Quarter Hours)

	Per Quarter	Per Year**
Instate	$210.00	$ 630.00
Instate Music Majors (approximate)	294.00	882.00
Out of State	400.00	1,200.00
Out of State Music Majors (approximate)	484.00	1,452.00

BREAKDOWN OF ACTUAL FEES CHARGED

Instructional Fee	180.00
General Fee	30.00
Non-Resident Tuition Surcharge	190.00
Applied Music Fee per Q.H.	14.00
Charges for each Q.H. above 17 Hours:	
Instructional Fee	18.00
Non-Resident Tuition Surcharge	19.00

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

**3 academic quarters.

FOR PART-TIME STUDENTS
(Below 12 Quarter Hours)

Instructional Fee per Q.H.	18.00
General Fee	10.00
Non-Resident Tuition Surcharge per Q.H.	19.00
Applied Music Fee per Q.H.	14.00

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 all students who are legal residents of another state or nation (See page 37, 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 and charges prorated in accordance with the regular University withdrawal and refund policies and their exceptions as stated further on in this section.

FOR CREDIT BY EXAMINATION

Fees are charged at the student's regular rate for each hour of credit honored for graduation when such credit is given as the result of examination or equivalency evaluation without the student's having attended the regular classes for the course of instruction. The credit by examination may be granted under special circumstances to students who can demonstrate proficiency in certain subjects. The subjects in which such examinations may be given and the nature of the examinations are to be determined by the departments and divisions concerned and must be approved by the dean of the appropriate school. Registration for credit by examination can be done *only prior to or during the first week of an academic quarter.*

TESTING FEES

Admission Test Fee for Graduate Study in Business (ATGSB). An aptitude test designed to measure abilities important to the study of business at the graduate level. The test is offered twice a year—fall and summer. The examination fee is $10.00 and registration forms are available at the University Counseling and Testing Center.

American College Test (ACT) Residual Test Fee. A non-refundable fee of $7.00 is charged for those students required to take the American College Test (ACT) on a residual basis.

Graduate Record Examination Fee. 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 $8.00; one Advanced Test is $9.00. Registration forms are available at the Counseling and Testing Center.

Miller Analogies Test. A verbal analogies test to measure scholastic aptitude at the graduate level. This test is offered by appointment only through the University Counseling and Testing Center. The fee of $6.00 is payable at the Bursar's Office.

National League for Nursing Achievement. 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 $10.00 is payable at the Bursar's Office.

OTHER FEES

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

Change of Registration Fee. A fee of $2.00 is charged anyone changing his 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.)

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 non-refundable 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.

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 $190.00. 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 Service 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 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 consist 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 non-refundable 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 non-refundable 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 $2.00 from the user. Loss of towel shall result in collection of a replacement fee of $1.00 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.

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 page 16, 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 his physician.

Late Payment Fee. A fee of $15.00 will be charged any student who pays his 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 $15.00 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 at the beginning of the academic year a specified amount as shown below toward coverage of the cost of United States Government property assigned him. When he returns all such property at the end of the year or upon withdrawal from the University, he 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 him, depending on the value.

First Year	$10.00
Second Year	$10.00
Third Year	$ 4.00
Fourth Year	$ 4.00

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:

$2.00 per offense if paid within thirty days of the offense.

$4.00 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, he must do so 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 (in a foreign language, for example), he is charged a fee of $10.00 except when he 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 non-refundable.

Registration Withdrawal Fee. A fee of $5.00 is charged when a student withdraws from all his 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 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 $325.00 a quarter, $925.00 for a full academic year, and $1225.00 for a full academic year and summer quarter. (For further information see On-Campus Student Housing under *Student Personnel Services.*)

R.O.T.C. Activity Fee. The Military Sci-

ence 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. The fee is payable at the Bursar's Office in Jones Hall, first floor. This fee is non-refundable.

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 $15.00. 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 prorated 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 window, Jones Hall, first floor.

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 well as those required by the University. Payment should be made at the Bursar's Office window, Jones Hall, first floor.

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 non-refundable fee of $15.00 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 $1.00 per entrance, collectible at the gate.

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 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 his schedule for reasons beyond his control, such as illness, military service, job transfer, or shift change imposed by his employer, may have his fees revised in proportion to the number of weeks attended. He must withdraw officially and present evidence to validate his change, for example: certificate from his physician giving the date he advised the student to withdraw from classes or reduce his 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 proportionately 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 Committee in care of the Bursar.

*Figured from opening date of classes.

†Excludes Sunday, for each specified time period.

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 Mathematics
Department of Military Science
Department of Philosophy and Religious Studies
Department of Physics and Astronomy
Department of Political Science
Department of Psychology
Department of Sociology and Anthropology

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, comprehensive science, the humanities, public relations, or social studies, or one of the combined majors mentioned in the next paragraph. 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, geology, mathematics, medical technology, and physics, 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 he satisfies all the graduation requirements for the degree he seeks. 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.‡ If a student wishes to include summer courses in his program, he should consult his advisor.

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.

‡This plan is not encouraged if the student intends to hold a strenuous or time-consuming outside job regularly while in the University.

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

	A.B.	B.S.
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		
Application for graduation		

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 (Same as under General Requirements and Regulations)

See page 45 for specific details.

Humanities‡	14	14
Social Studies	20	20
Science/Mathematics	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 theological studies.

OTHER COURSES (In addition to General Requirements and Regulations)	**A.B.**	**B.S.**
A foreign language	8 or 20	4 or 16
For the A.B. degree: the requirement is such a knowledge of the foreign language and its literature as achieved at the completion of the second year of college study or its equivalent. The number of hours a student will need to attain this knowledge depends on the number of years of language completed in high school, and on whether or not he continues the same language in college.		
For the B.S. degree: the requirement is the successful completion of the first quarter of the intermediate language course, if the same language the student used to fulfill his entrance requirement, or the first full year of college foreign language if a different language is elected.		
Balance required for graduation	—	—
The student allots these hours, in accordance with requirements and his own desires, to completing a major, one or more minors, the foreign language requirement, teaching fields, other special objectives, and elective courses anywhere in the University for which he can satisfy the prerequisites and which are acceptable toward the degree.		
Teacher-education courses (high school)	—	—
Education 501, Introduction to Education; 704, Student Teaching Laboratory: High School and Special Field; 706, Principles of Teaching; 708, Educational Sociology; 710, Educational Measurement and Guidance; 800, Special Methods; and 842 or 843, Supervised Student Teaching: High School and Special Field; and Psychology 709, Educational Psychology. These courses are a degree requirement for B.S. in Ed. students preparing to teach in high school and a certification requirement for the A.B. and B.S. degrees	41*	41*

*This includes Education 502.

PROFICIENCY IN A FOREIGN LANGUAGE

The student's proficiency in a foreign language is determined by an 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, will satisfy the requirement, with no further study in the University. A student who has three high school units in one language may meet the requirements by taking the final intermediate course in that language. A student with two high school units in one language may meet the requirements by taking all the intermediate courses in that language. A student with two or three years of language in high school may repeat any of his high school language courses for credit if he desires. A student with one or no high school units in a foreign language may meet the requirement by taking both the elementary and intermediate courses in one language, but he receives no University course credit for the elementary course.*

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, will satisfy the requirement, with no further study required in the University. A student with two high school units in one foreign language may complete the requirement either by taking the first intermediate course in the same language, or by taking the first full year of another foreign language. A student who has completed two years of language in high school may repeat any of his high school language courses for credit if he desires. A student with one or no high school unit in a foreign language may meet the requirement by taking the elementary courses and the first intermediate course in one foreign language, or by taking the elementary courses in each of two foreign languages.

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 fullfill 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.

*A student who has had only one year in high school might go into the second quarter of the elementary course in college, but 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.

COURSES OF INSTRUCTION AND CURRICULUMS‡

AMERICAN STUDIES

Professor W. Miner (advisor).

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 preprofessional 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 for his needs.

The major is designed so that the student will be stimulated to comprehend his own culture with realistic understanding and with critical detachment. Therefore, he will study 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.

†If the student wishes, he may be given as many as eight quarter hours by paying the Fee for Credit by Examination. (*See Fees and Expenses.*)

‡The student should familiarize himself 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.

Option I:

A. Required courses:
1. History 655, 656.
2. English 613, 614.
3. A foreign "civilization" course (such as German 712).
4. Geography 627.
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 his sophomore year work out with the advisor an individual pattern of courses appropriate to the problem. A student must initiate his own 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 and Anthropology.*

ASTRONOMY

See *Physics and Astronomy.*

BIBLE

See *Philosophy and Religious Studies;* also *Humanities.*

BIOLOGICAL SCIENCES

Professors Van Zandt (chairman) and Kelley; Associate Professors Karas, Peterson, Schroeder, and Sobota; Assistant Professors Cannon, Fishbeck, Kreutzer, MacLean, Rufh, Sturm, Toepfer, and Yemma; Instructors Brennan, Chuey, Sebastiani, and Staudt.

Courses taken in the Department of Biological Sciences may be applied toward a Bachelor of Science or Bachelor of Arts degree in biology. The department also offers specialized courses that provide basic information needed by students planning to enter medicine, dentistry, veterinary medicine, nursing, medical technology, numerous other health-related careers, forestry, and teaching.

Refer to the Graduate Bulletin for a description of the master's program in biology.

REQUIREMENTS FOR MAJOR IN BIOLOGY[1]

	Bachelor of Arts	Bachelor of Science
Required courses in Biology[2]	553, 662, 721, 780, 790	553, 662, 721, 780, 790
Upper Division electives in Biology[3]	21 q.h.	29 q.h.

[1]Students seeking admission to medically related professional schools should fulfill the B.S. requirements in biology.

[2]These courses provide a core of subject matter which should be mastered by all students of biology. However, if a student has already completed 506, 507 and 508, these may be substituted for 553 and 662. All biology majors must take 721, 780 and 790.

[3]Courses numbered 700 and above offered in biology count toward Upper Division biology electives.

Chemistry	515, 516, 517 Organic recommended	515, 516, 517, 719, 720, 721
Physics	One year recommended	501, 502, 502L, 503, 503L
Mathematics	Statistics recommended	550, 714
Social Studies[4]	20 q.h.	20 q.h.
English Composition[4]	8 q.h.	8 q.h.
Humanities[4]	14 q.h.	14 q.h.
Language[4]	8 q.h.	8 q.h.
Electives[5]		

[4]General University requirements: see page 42 in the YSU Bulletin (catalog issue) for details.

[5]Electives of student's choice may be taken from various departments in the University: earth science, computer science, advanced mathematics, and psychology are recommended.

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 to be taken by majors or by students needing biology as prerequisite for further course work. 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. Three hours lecture and two hours laboratory per week; must be taken in sequence. 4+4 q.h.

553. *Animal Life.* Phylogenetic and adaptive physiological relationships of animals to their environment. Intended for biology majors. Laboratory will demonstrate function of physiological systems. Students who have taken Biol. 670 will not receive credit for Biol. 553. Three hours lecture and one 3-hour lab.-discussion period per week. 5 q.h.

560. *Paramedical Microbiology.* Characteristics, epidemiology, and pathology of virus, rickettsiae, bacteria, and protozoa of medical significance. Three hours lecture and one 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.

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.

662. *Plant Life.* Structure, reproduction, physiology, and phylogenetic relations of plants. Intended for biology majors. Three hours lecture and one three-hour lab-discussion period per week. Prereq.: Biol. 553. 5 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. Field work will be required as part of

laboratory studies. 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 identification, range, and silvical characteristics. Field work will be required as part of laboratory studies. Prereq.: Biol. 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. Three hours lecture and two hours laboratory per week. Prereq.: Biol. 506 or consent of instructor. 4 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, and 508 or Biol. 662. 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 or Biol. 662. 5 q.h.

702. *Microbiology*. Isolation, cultivation, identification, classification, and laboratory study of microorganisms. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 790 or permission of instructor. 4 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 or 775. 5 q.h.

721. *Genetics*. Study of the Mendelian laws, genes in populations, and the structure and function of the genetic material. Prereq.: Biol. 506, 507 and 508 or Biol. 662. 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 of laboratory weekly. 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 or Biol. 662. 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 and 508 or Biol. 662. 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 or Biol. 662. 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.: One year of biology. 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 or Biol. 662. 5 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 consensus of instructors. 4 q.h.

790. *Molecular-Cellular Biology*. Chem-

ical-physical functions of cellular structures. Investigative laboratories permit students to test hypothesis independently. Students who have taken Biology 680 will not receive credit for 790. Three hours lecture and one three-hour laboratory discussion period per week. Prereq.: Biol. 506 or 553. 5 q.h.

801. *Environmental Microbiology.* The activities of microorganisms, primarily bacteria, in air, soil, water and sewage. Two hours lecture and four hours of laboratory per week. Prereq.: Biol. 702. 4 q.h.

802. *Ecology.* A study of plants and animals in relation to environmental factors affecting their abundance and distribution. Three hours lecture and four hours laboratory per week. Prereq.: 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.

808. *Vertebrate Embryology.* Classical and experimental study of the fundamental mechanics of developmental processes in selected vertebrates. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 770 or consent of instructor. (Students who have taken Biol. 708 will not receive credit for Biol. 808). 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.* Phylogenetics, 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. Students who have taken Biol. 719 cannot receive credit for this course. 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. 662 or consent of instructor. 5 q.h.

822. *Plant Physiology.* Physiochemical nature of life processes of plants. Four hours lecture and two hours laboratory per week. Prereq.: Biol. 506, 507 and 508 or Biol. 662 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. 780 and 790. 4 q.h.

831. *Biological Seminar.* A study of the historical and contemporary literature in biology. Written and oral reports, round-table discussions. Prereq.: Junior standing and consent of instructor. 2 q.h.

834, 835. *Vertebrate Physiology.* Physical and chemical principles involved in physiology of muscle contraction, nerve conduction, digestion, respiration, circulation, excretion, and endocrine system. Three hours lecture and two hours laboratory per week. Prereq.: Registration by permit only. 4+4 q.h.

836. *Cell Biology.* A study of the basic problems and methods in cell biology including the unique chemical and physical properties of living cells; ultrastructure, energy production, biosynthesis, permeability, active transport and the role of nucleic acids. Two hours lecture and four hours laboratory per week. Students who have had Biol. 832 will not receive credit for Biology 836. Prereq.: Chem. 721, Biol. 790 or consent of instructor. 4 q.h.

837. *Cytology and Techniques.* A study of the structure and organization of proto-

plasm using current methods of preparing and observing living and fixed cells. Two hours lecture and four hours laboratory per week. Students who have had Biol. 832 will not receive credit for Biol. 837. Prereq.: Biol. 721 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.

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.

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.

874. *Helminthology*. Detailed consideration of parasitic helminths including techniques for collecting, killing, staining, and studying parasites. Two hours lecture and four hours laboratory per week. Prereq.: Biol. 841 or consent of instructor. 4 q.h.

Pre-Forestry

Suggested curriculum which may be transferred to schools of forestry.

FIRST YEAR	Q.H.
Biology 506, 507, 508, 565	16
Chemistry 515, 516, 517	12
English 550-551	8
Electives	14
	50

SECOND YEAR	Q.H.
Biology 665, 666, 822	13
Mathematics 714	5
Physics 501, 502, 502L, 503, 503L	12
Social Studies	12
Health 590	3
Electives	5
	50

Advanced Degree Program

Youngstown State University offers a program in forestry in cooperation with the School of Forestry at Duke University. Upon completion of this coordinated five-year course of study, the student earns the Bachelor of Science degree from Youngstown State University and the professional degree, Master of Forestry, from Duke University.

The student who pursues this course of study spends his first three years in residence at Youngstown State University, where he takes courses in liberal arts and sciences basic to forestry. He spends the last two years and the summer following his junior year at the Duke School of Forestry, in professional studies.

The candidate for this program enrolls in the pre-forestry curriculum when he enters Youngstown State University. During his junior year he may apply for admission to Duke University if his cumulative point index is at least 3.00; no application for admission to Duke University need be made prior to that time.

Recommended curriculum meeting requirements of the medically related professional schools.[1]

BIOLOGY*
553—Animal Life
662—Plant Life
721—Genetics
780—Introduction to Ecology
790—Molecular-Cellular Biology

Medical schools in general recommend the following Upper Division courses:
702—Microbiology
713—Vertebrate Histology
770—Vertebrate Zoology
775—Comparative Anatomy

[1]For general University requirements, see page of this catalog issue.

*506-507-508 may be substituted for 553 and 662.

808—Vertebrate Embryology
834-835—Vertebrate Physiology
836—Cell Biology

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

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 curriculum designed for the Associate in Arts program in the related health sciences exclusive of nursing, see the Technical and Community College section of this catalog.

BLACK STUDIES

Assistant 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 interdisciplinary major is to facilitate the academic investigation and analysis of the historical, social and aesthetic impact of the people of African descent on the American society and the world. It also provides for the systematic study of the problems confronting the modern multi-racial 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:

I. 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

*These courses are optional depending on student's background and the graduation requirements of his chosen school of forestry.

*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+3 q.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.

**For course descriptions and prerequisites, see respective departmental listings.

BOTANY

See *Biological Sciences.*

CHEMISTRY

Professors Rand (acting chairman), Cohen, and Mahadeviah; Associate Professors Del Bene, Dobbelstein, Foldvary, Gebelein, F. W. Smith, R. K. Smith, Spiegel, Van Norman, von Ostwalden, and Yingst; Assistant Professors Koknat, Lukin, Mettee, Phillips, Reeder, and Schildcrout.

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 or secondary education. The chemistry courses required for an A.B. degree with a major in chemistry are those listed in the curriculums below. The required courses for a B.S. degree with a major in chemistry are those listed in the B.S. curriculum. Chemistry majors who take Chemistry 501 need 190 q.h. instead of 186 q.h. for graduation.

Students in two-year pre-professional programs such as pre-pharmacy and pre-optometry may obtain appropriate curriculums and advisement in the Chemistry Department.

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.

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 of 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 of 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.

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; 3 hours lecture and 6 hours laboratory each week. Prereq.: Chemistry 517. 5+5 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 of 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. 2 q.h.

709. *Introduction to Polymer Chemistry.* Introduction to polymerization and polymer properties. Prereq.: Chemistry 721. 3 q.h.

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 of laboratory with discussions. Prereq.: Chemistry 603 and 721, one year of biology. 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. 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. 4+4+4 q.h.

722. *Organic Chemistry IV.* Additional

*Must be taken in sequence.

laboratory preparations and techniques. This course is required for all candidates for the B.S. degree with a major in chemistry. One hour lecture and three hours laboratory. Prereq. or concurrent: Chemistry 721. 2 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. 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.

731. *Nuclear Chemistry and Its Applications.* Nuclear structure and reactions, types of radioactive decay, radiation detection, measurements and techniques in handling radioactive materials. Prereq.: Chemistry 740 or 801. 3 q.h.

739, 740, 741. *Physical Chemistry I, II, III.** Principles and applications of physical chemistry. Three hours of lecture and a three-hour laboratory. Prereq.: Chemistry 603, Physics 611, 610L and 611L. Mathematics 674 (may be concurrent). 4+4+4 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, Physics 503, Math 550, plus either senior standing in a science department or consent of the Chemistry Department chairman. 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 741 or permission of instructor. 3 q.h.

813. *Thermodynamics.* Fundamentals of thermodynamics and the application of these fundamentals to ideal and real chemical systems. Also, an introduction to statistical thermodynamics. Four hours lecture. Prereq.: Chemistry 741 or senior standing in physics. 4 q.h.

821. *Intermediate Organic Chemistry.* An introduction to advanced study in organic reactions and theories. Three hours of lecture. Prereq.: Chemistry 741 (may be concurrent) and 722. 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 722. 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 722. 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 of laboratory with discussions. Prereq.: Chemistry 729 and 741. 2 q.h.

836. *Chemical Bonding and Structure.* Applications of various bonding theories to molecular structure. Three hours lecture. Prereq.: Chemistry 741. 3 q.h.

841, 842, 843. *Principles of Biochemistry I, II, III.** The study of chemical structures, functions and transformations which occur within living cells. Topics include the chemistry and metabolism of carbohydrates, lipids, proteins, nucleic acids, enzymes, hormones, biochemical genetics, and metabolic control mechanisms. Prereq.: Chemistry 721 and 741. 3+3+3 q.h.

845, 846. *Biochemical Techniques.* Laboratory course designed to illustrate modern

*Must be taken in sequence.

biochemical methods such as chromatography, electrophoresis, spectrophotometry, enzyme kinetics and isotopic tracer techniques. Need not be taken in sequence. Prereq. or concurrent: Chemistry 841. 2+2 q.h.

850. *Senior Research.* When possible, each student works on a different phase of a group problem. May be taken three quarters. Prereq.: Three years of college chemistry, including Chemistry 741.
2 or 3 q.h. each quarter

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.

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 722	2
Chemistry 603, 604	10
Physics 510, 610, 610L, 611, 611L	14
Mathematics 674	4
Electives (See note)	3
	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
Electives (See note)	36
	45

NOTE: These electives must include at least 3 quarter hours of chemistry laboratory, of which no more than 1 quarter hour may be Senior Research (Chemistry 850). Three additional quarter hours of these electives must be either in 800-level chemistry or in Upper Division mathematics or physics. In addition the electives must satisfy the general University requirements for Upper Division credit, the social studies, the humanities, and a minor, and they 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, 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
Health and Physical Education 590	3
Biology 506, 507, 508	12
	44

SECOND YEAR	Hrs.
Chemistry 603, 604	10
Mathematics 673, 674	9
Biology 770	3
Physics 510, 610, 611, 610L, 611L	14
Electives (See note below)	14
	50

THIRD YEAR	Hrs.
Chemistry 719, 720, 721	12
Biology 775	5
Health and Physical Education Activity	3
Electives (See note below)	26
	46

FOURTH YEAR	Hrs.
Chemistry 739, 740, 741	12
Chemistry 729	3
Biology 721, 721L	4
Biology 708	4
Electives (See note below)	23
	46

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.

Recommended curriculum leading to an A.B. degree with a major in chemistry, meeting requirements for certification for high school teaching in chemistry.

FIRST YEAR	Hrs.
Chemistry 515, 516, 517	12
English 550-551	8
English 525-526-527	12
Mathematics 571, 572, 673	14
Health and Physical Education 590	3
Electives (See note below)	11
	48

SECOND YEAR	Hrs.
Chemistry 603, 604	10
Mathematics 674	4
Physics 510, 610, 610L, 611, 611L	14
Education 501	3
Psychology 601	5
Electives (See note below)	10
	46

THIRD YEAR	Hrs.
Chemistry 719, 720, 721	12
Chemistry 739, 740, 741	12
Education 704, 706, 708	9
Psychology 709	4
Health and Physical Education Activity	3
Electives (See note below)	8
	48

FOURTH YEAR	Hrs.
Chemistry 729	3
Education 800	3
Education 842	15
Electives (See note below)	23
	44

Note (a): 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.

(b): Education 502 may also be required.

MEDICAL TECHNOLOGY

Students majoring in medical technology have a nominal chemistry major and are advised in the Chemistry Department. The B.S. degree with a major in medical technology is awarded upon successful completion of the three-year academic curriculum and one year of training in a hospital school accredited by the American Society of Clinical Pathologists (ASCP). The required courses are those listed in the following curriculum.

Recommended curriculum leading to a B.S. degree with a major in medical technology.

FIRST YEAR	Hrs.
Chemistry 515, 516, 517	12
English 550-551	8
Biology 506, 507, 508	12
Health and Physical Education 590	3
Health and Physical Education Activity	1
Electives (See note a)	12
	48

SECOND YEAR	Hrs.
Chemistry 719, 720, 721	12
Chemistry 603, 604	10
Mathematics 714	5
Biology 551, 552	8
Physics 501	4
Electives (See note a)	9
	48

THIRD YEAR	Hrs.
Chemistry 711, 712, 713	8
Biology 702	4
Physics 502, 502L, 503, 503L	8
Health and Physical Education Activity	2
Biology Elective (See note b)	4
Electives (See note a)	18
	44

FOURTH YEAR	Hrs.
Satisfactory completion of the internship in an accredited hospital school of medical technology	46
Total academic credit of 46 q.h. earned in the fourth year is classified as follows:	
Credit towards the University requirement for courses of 600-level and above	46
Credit towards University requirements for Upper Division courses	23
Chemistry credit	3

Note (a): The electives must satisfy the University requirements for Upper Division credit, the social studies (20 q.h.), and the humanities (10 q.h.)

(b): Biology 721 or 741 is highly recommended.

CLASSICAL STUDIES*

Associate Professor Ives (advisor).

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

*The former Department of Classical Studies is now the Office of Classical Studies; its chairman is now the Advisor for Classical Studies.

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, introduce him to some of its influential products, and stimulate him 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 should 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 civilizations 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 (except English 708, 709, and 710); 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 (except English 708, 709, and 710); or junior or senior standing; or consent of the Advisor for Classical Studies. Listed also as Humanities 831 and English 831. 4 q.h.

COMPREHENSIVE SCIENCE

A comprehensive science major leading

to the degree Bachelor of Science 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.

CRIMINOLOGY

See *Criminal Justice,* Technical and Community College section.

DRAMATICS

See *Speech and Dramatics,* College of Fine and Performing Arts section.

EARTH SCIENCE

Assistant Professor E. Harris, Jr. (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.*

Courses for Earth Science Major:

Astronomy
- 504 Descriptive Astronomy 4
- 608 General II 3

Chemistry
- 502 Survey of Chemistry II 4
- 503 Survey of Chemistry III 4

or
- 515 General Chemistry 4
- 516 General Chemistry 4

Geography
- 625 General Meteorology 4

*Interested students should consult with the Geology Department chairman.

Geology
- 505 Principles of Physical Geology 4
- 506 Principles of Historical Geology 4
- 607 Geology Laboratory 4
- 602 Introduction to Oceanography 4
- 604 Megascopic Petrography 6
- 701 Geomorphology 6
- 705 Principles of Paleontology 6
- 805 Special Problems in Geology 1
- 811 Environmental Geology 4

and one of any of the following
- 706 Geology of Economic Mineral Deposits 5
- 702 Glacial Geology 5
- 703 Physiography of the United States 6
- 704 Structural Geology 5
- 801 Mineralogy 6

Physics
- 501 Fundamentals of Physics 4
- 502 Fundamentals of Physics 3

ECONOMICS

Professors Hahn, Kermani, and Stocks; Associate Professors Mackall (chairman), Liu, Mehra, and Niemi; Assistant Professors Bee, Koss, Milley, Ronaghy, and Smythe; Instructor Morris.

A major in economics consists of 48 quarter hours. Required courses are 520, 621, 622; 704, 705, 706; 710, 712.

Two of the following courses may be applied toward a major in economics: History 714, 715, 716, 783, 784, 785, 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

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 output determination, resource allocation, pricing and employment of resources. Prereq.: 520. 3 q.h.

621H. *Principles of Economics II, Honors.* An 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, under-developed countries, poverty, and comparative economic systems. Prereq.: 621. 3 q.h.

622H. *Principles of Economics III, Honors.* An 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. 3 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.

704. *Economics and Social Statistics I.* Probability theory with emphasis upon uncertainty in estimating parameters and testing hypotheses. The evaluation of single samples for purposes of estimating and testing. Prereq.: Sophomore standing. 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 704. 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.

787. *Population Movements.* Trends in world population in their relation to history, migration, and urbanization. Human demog-

raphy 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.

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. (F) 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.

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.

899. *Individual Study in Economics.* A course for a student wanting to pursue a study of a topic, area, or problem in economics 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.

ENGLISH

Professors Hankey, T. Miner, and W. Miner; Associate Professors Hare, Ives, Kelty, McCracken, Rosenthal, Secrist, and Solimine; Assistant Professors Alderman (chairman), C. Baird, L. Baird, Baker, Brothers, Budge, Bunnag, Copeland, Einstein, C. Gay, T. Gay, Henke, Houck, Hwopek, Knapp, Murphy, Schultz, Sniderman, and Wilkinson; Instructors Clark, Crites, Hoffman, Martindale, Nitsche, Schafer, Shale, and vanGorder.

Beyond the freshman sequence, English majors are expected to complete 45 hours including: English 755 and 756; a course in advanced composition (English 715, 716, 740, 743, 744, or 745); and two Survey of English Literature courses and one Survey of American Literature course, or two Upper Division literature courses in the area of any one of the three survey courses not elected. Upper Division courses in the area of the surveys are as follows:

I. In the area of English 611: English 760, 761, 762, 777, 860, 863, 881, 882, 883, 884, 886, 899 (when appropriate); Humanities 832, 834, 880.

II. In the area of English 612: English 778, 868, 891, 895, 899 (when appropriate); Humanities 864, 876.

III. In the area of English 613, 614: English 770, 775, 815, 865, 868, 871, 899 (when appropriate).

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 satisfactory term paper in an Upper Division English course.

Students who plan to teach high school English should major in English and complete the requirements for certification, in-

cluding 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 faculty members jointly appointed to the Departments of English and Secondary Education. Their office is Arts and Science Office Building, room 319.

The completion of the freshman sequence is required of all University students.

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 the freshman sequence is prerequisite to all other English courses. Any literature course in English or Humanities (except 708, 709, 710), or junior or senior standing is normally the prerequisite to Upper Division courses in literature and to advanced writing courses. Under special circumstances, however, the department chairman may grant permission to enter 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 reference to 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' Course

510. *English for Foreign Students.* An intensive course in speaking, comprehending, reading, and writing English as a second language. The course includes both class instruction and drill. Designed for foreigners who have an elementary knowledge of English, but one which is inadequate for the needs of the college classroom. The class meets daily for a total of six hours a week. A student may repeat the course as many times as necessary to achieve a satisfactory rating. The course carries no credit toward graduation. 6 q.h.

Lower Division Courses

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 available 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.

609. *Introduction to Literature.* A non-technical, non-historical course in which important works of English and American literature are read and discussed critically for increased enjoyment and understanding. Prereq.: English 527 or its equivalent. 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 527 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 527 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 527 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 527 or its equivalent. 4 q.h.

620. *Introduction to African Literature.*

Identical with Humanities 620. 4 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 756.* Prereq.: English 527 or its equivalent. 5 q.h.

699H. *Honors Seminar: Landmarks of Literary History.* A critical exploration of a limited topic in literary history. The specific epoch or decade in English or American literature to be treated is announced each time the course is offered. May be repeated once. Prereq.: English 527 or its equivalent, and consent of the English Honors coordinator. 4 q.h.

Upper Division Courses

Prerequisite to the following courses, unless otherwise stated: any 600-level literature course in English or Humanities; or junior or senior standing; 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; does not count toward a major in English.* Prereq.: English 527 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; does not count toward a major in English.* Prereq.: English 527 or its equivalent. 4 q.h.

710. *Juvenile Non-Fiction.* A study of non-fiction 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 given to the quality of various series, and criteria for evaluation. *Does not satisfy the graduation requirement in the 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.

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. 4 q.h.

743, 744, 745. *Creative Writing I, II, III.* Courses in advanced composition for mature students, providing opportunity to develop creative ability. English 743 offered in fall quarter, 744 in winter quarter, 745 in spring quarter. 3+3+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 527 or its equivalent. 5 q.h.

756. *History and Structure of English.* Survey of the historical development of English language structure and its social context from its origins to the present. Prereq.: English 755. 5 q.h.

760, 761, 762. *Shakespeare I, II, III.* A study of the development of Shakespeare's dramatic art. English 760: early comedies and tragedies, histories through HENRY V; 761: JULIUS CAESAR, romantic comedies, HAMLET and problem comedies; 762: major tragedies (excluding HAMLET) and late romances. 3+3+3 q.h.

770. *Major American Authors.* Intensive reading of several American writers. Writers considered vary, but are announced each time the course is offered. For example, the approach might be through transcendentalism, the democratic tradition, realism, or naturalism. 4 q.h.

775. *The American Novel.* The history and development of the novel in the United States during the nineteenth and twentieth centuries. 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.

815. *American Periodicals.* Identical with Journalism 815. 4 q.h.

820. *Literary Criticism.* A survey of the principal works in criticism from antiquity to the present, with special attenton to Aristotle's *Poetics,* Plato, Sidney, Jonson, Dryden, Johnson, the Romantics, Arnold, and Eliot. Prereq.: Two Upper Division courses in English literature. 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.

859. *Selected Topics in Linguistics.* Identical with Linguistics 859. Prereq.: English 755 or consent of the instructor. 3-5 q.h.

860. *Chaucer.* Reading of Chaucer's principal works, with some study of his immediate predecessors and contemporaries. 4 q.h.

863. *English Drama to 1642.* The history of the drama in England from the beginnings to the closing of the theaters in 1642, with emphasis on Elizabethan and Jacobean drama, excluding Shakespeare. 4 q.h.

864. *Modern Drama.* Identical with Humanities 864. 4 q.h.

865. *American Drama.* The emphasis is mainly on the drama since 1915. 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.

881. *The Sixteenth Century.* Important non-dramatic works in prose and poetry of the English Renaissance with emphasis on Spenser and his contemporaries. 4 q.h.

882. *The Seventeenth Century.* Important non-dramatic works in prose and poetry, excluding Milton, with emphasis on Bacon, Donne, Jonson, Brown and Taylor. 4 q.h.

883. *Milton.* A study of Milton's minor poems, *Paradise Lost, Samson Agonistes,* and selections from his prose, in their historical context. 3 q.h.

884. *The Restoration and Early Eighteenth Century.* Important works in poetry and prose, including the drama but not the novel, from 1660 to 1740, with emphasis on Dryden, Congreve, Pope and Swift. 4 q.h.

886. *The Later Eighteenth Century.* Important works in poetry and prose, including the drama but not the novel, from 1740 to the end of the eighteenth century, with emphasis on Johnson, Sheridan, Cowper, Burns and Blake. 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.

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. *Twentieth-Century British Literature.* A study of major literary trends since 1900, with emphasis on the novel and shorter prose works. 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

Professor C. Dykema (chairman); Associate Professors Aliberti, Garcia, and Metzger; Assistant Professors Barna-Gulanich, Linkhorn, Loud, Veccia, and Viehmeyer.

See French, German, Greek, Italian, Latin, Russian, and Spanish. For literature in translation, see *Humanities.*

FORESTRY

See *Pre-Forestry.*

FRENCH

A major in French consists of 45 quarter hours above the elementary level, of which 20 quarter hours must be in literature.

Lower Division Courses

See pages 42 and 62 for pre-college and college language requirements.

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.

602. *Intermediate French II.* Continuation of French 601. Prereq.: 601 or equivalent. 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.

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, Direrot, 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 perceptive 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. 4 q.h.

GEOGRAPHY

Professor Klasovsky (chairman); Associate Professor Laitman; Assistant Professors Anton, Manton, and Matzye; Instructors Stephens and Vechiarella.

A major in geography consists of a minimum of 45 quarter hours and must include Geography 502, 503, 519, 627 and 810; at least 30 quarter hours must be earned in Upper Division courses.

An emphasis in urban geography can be obtained by taking Geography 725, 726, 808 and 809 together with selected electives including Economics 804, 820 and 821; Political Science 720, 721 and 722; Sociology 707. Such an emphasis can be arranged in consultation with the student's advisor.

A minor in geography consists of 22 quarter hours. Those wishing to minor in physical geography should include Geography 503, 603, 604, 625 and Geology 701 in their programs.

SUGGESTED ELECTIVES:

Economics 704 and 705, and Geology 505, 506 and 507 are recommended electives for geography majors; other acceptable upper-level electives are dependent upon the student's area of interest.

Physical Geography

The following geography courses may be used to satisfy the University's science/mathematics requirement: 503, 603, 604, 625. The Geography Department will accept Geology 701 and 703 for credit as courses in physical geography.

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.

604. *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. 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.

NOTE: All other geography courses listed below may be used to satisfy the University's social science requirement.

Lower Division Courses

502. *Introduction to Geography.* An introductory study of causal 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.

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.)

GEOLOGY

Associate Professor Khawaja; Assistant Professors E. Harris (chairman) Abram, A. Harris, 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 minimum of 65 quarter hours of courses in geology of which 61 quarter hours are specified and 4 quarter hours are elective. The specified courses are: Geology *505, *506, *607, 706, *604, 701, *704, 705, 801, 802, 803, and a course in field geology prior to the first quarter of his senior year. The latter must carry a minimum of 4 quarter hours of credit and be at a school approved by the chairman of the Department of Geology. Electives may be chosen from any of the geology courses listed except as otherwise noted. The minor must be either chemistry, biology, mathematics or physics unless the student's future plans justify a different minor.

The specific courses for the minor are chosen in consultation with the department chairman.

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, *607, 706, *604, 701, *704, 705, 801, and a course in field geology prior to the first quarter of his senior year. The latter must carry a minimum of 4 quarter hours of credit and be at a school approved by the chairman of the Department of Geology. Electives may be chosen from any of the geology courses listed except as otherwise noted. The student may choose any minor that he desires. Required courses outside the department are: Astronomy 608; Chemistry 515, 516, 517; Mathematics 550; Physics 501, 502, 503, 502L and 503L.

The student majoring in geology is required to take a comprehensive examination two quarters 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 affect-

*These courses must be completed prior to attending the course in field geology.

ing 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. Prereq.: Geology 505, 506. 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.

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. 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 with respect to what they are, and when and how they were formed. Maps, diagrams, and aerial photographs are used in laboratory work. Five hours of lecture and four hours of laboratory work per week. Prereq.: Geology 701. 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.

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. Earth Science Curriculum Project materials will be used. 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, of which 20 quarter hours must be in literature courses.

Lower Division Courses

See pages 42 and 62 for pre-college and college language requirements.

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.

602. *Intermediate German II.* Continuation of literary and cultural readings with oral and written interpretations. Prereq.: German 601 or equivalent. 4 q.h.

615. *Intermediate German Readings.* Intensive reading of poems and short stories intended primarily to prepare the students for the Survey of German Literature courses. 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 Compostion.* Skill in writing German developed through

directed composition. Prereq.: German 602 or equivalent. 4 q.h.

Upper Division Courses

705. *Survey of German Literature I.* An introduction to the study of German literature. Readings from major works from the beginnings to Romanticism. Prereq.: German 615. 4 q.h.

706. *Survey of German Literature II.* Continuation of German 705. Readings from major works from Romanticism to the present. Prereq.: German 615. 4 q.h.

712. *German Civilization.* A survey of the historical, cultural, and social heritage of German speaking peoples. Prereq.: German 615. 4 q.h.

740. *Advanced German Grammar.* Advanced study of German grammar and sentence structure. Prereq.: German 620. 4 q.h.

745. *Advanced German Composition.* Advanced training in written self-expression. Class discussions of students' original compositions in German. Prereq.: German 620. 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 745. 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 705. 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 705. 4 q.h.

825. *German Romanticism.* Intensive study of early and late German Romanticism including the reading of belletristic and theoretical writings. Prereq.: German 706. 4 q.h.

835. *German Realism and Naturalism.* Intensive study of German literature from Poetic Realism through Naturalism. Prereq.: German 706. 4 q.h.

845. *Recent German Literature.* Study of major authors since Naturalism, including Mann, Hesse, Kafka, Rilke, Hoffmannsthal, George, and others. Prereq.: German 706. 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 three times for credit, if content is not repeated. Prereq.: German 705 and/or 706, depending on the topic. 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.*

Lower Division Courses

See pages 42 and 62 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. 3+3+3 q.h.

601. *Intermediate Greek I.* Reading in one or more authors, preceded or accompanied by review of elementary Greek if needed. Prereq.: Greek 503 or equivalent. 3 q.h.

602, 603. *Intermediate Greek II and III.* Continuation of Greek 601. Prereq.: Greek 601. 3+3 q.h.

Upper Division Courses

These courses can be given on request. The normal prerequisite is Greek 603 or its equivalent.

701. *Advanced Readings.* Reading in one

or more major Greek writers, selected with consideration of the students' interests. 3 q.h.

702, 703. *Advanced Readings.* Like Greek 701, either as a continuation of it or as separate courses in other authors. 3+3 q.h.

HEALTH AND PHYSICAL EDUCATION

Associate Professors Ringer (chairman), Carson, and Philipp; Assistant Professors Barret, Connelly, Kocinski, Laborde, Liptak, Loehr, Longmuir, Ramsey, Rosselli, Thompson, Whitney, and Wright; Instructors DiEdwardo, Dove, Katerberg, Wedekind, and Wilkerson.

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

Every student seeking a degree from Youngstown State University must earn a minimum of six quarter hours of credit in Health and Physical Education. Of these, three quarter hours are in Health 590 (509); the other three, normally, are in physical activity courses, each providing one quarter hour of credit. The three quarter hours in physical activity are waived for R.O.T.C. students who have completed Military Science 501, 502, 503 and 601, 602, 603. Students who have had one or more years of continuous military service must consult with the Admissions Office.

Members of the varsity baseball, basketball, football, golf, swimming, tennis, rifle squads, and women's extramural sports: basketball, field hockey, gymnastics, softball, swimming, and volleyball may receive physical activity credit through enrollment in 549R, Varsity Competition.

The form of activity is chosen by the student. Activity courses will be listed in the quarterly class bulletins under the designations: Men, Women, Coeducational, or H&PE Majors (except by departmental consent). The R suffixes for activity courses are used to distinguish course numbers from those used prior to the 1971-1972 catalog.

Locker and towel service is available upon payment of a fee (see fees on page 59). The fee is required for specific courses as indicated in the course descriptions. Students must provide their own clothing for activity classes and this attire must be appropriate to the activity. Most of the other equipment for physical activities is available for use without charge. A student wishing to use his own racket, golf clubs, bow, etc., may do so, but he is advised to consult with his 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.

HEALTH EDUCATION MAJOR CURRICULUM GUIDE

Students should average 48 quarter hours per year.

FIRST YEAR	Hrs.
English 550-551	4+4
Fine Art 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 (See Biology 721—3rd year)	4 or 8
Math. elective	4
General electives†	5

SECOND YEAR	Hrs.
Philosophy elective	4
Speech 553	3
Biology 551, 552	4+4
Psychology 601	5
Psychology 709	4
Psychology 755 or 756	4
Social Science elective	9
Sociology 500	4
Science elective	4
H&PE 690	3

THIRD YEAR	Hrs.
Education 704, 706, 708	3+3+4
H&PE 701	1
H&PE 790	4
H&PE 791	4
H&PE 792	3
Psychology 707, 708, Sociology 705 or Home Economics 772	3 or 4
Biology 721 (if both Chemistry 501 and Home Economics 551 not taken)	3
General electives†	20

FOURTH YEAR	Hrs.
Education 843	15
H&PE 890	4
H&PE 891	4
H&PE 899	2
H&PE 860	4
General electives	15

PHYSICAL EDUCATION MAJOR CURRICULUM GUIDE

Students should average 48 quarter hours per year

†Electives should be applied toward minor field.

FIRST YEAR	Hrs.
English 550-551	4+4
Biology 506, 507	4+4
Education 501	3
Fine Art elective	3
Speech 553	3
H&PE 590	3
H&PE 595	2
H&PE 601	3
H&PE 501	1
H&PE 502	1
H&PE 506	1
H&PE 516	1
H&PE 517	1
H&PE 522	1
H&PE 545	1
H&PE 560	1
H&PE 525 (Men)	1
H&PE 500 (Women)	1
H&PE 503 (Women)	1
H&PE 504 (Women)	1
H&PE Aquatics	1
Math. elective	4

SECOND YEAR	Hrs.
Philosophy elective	4
Humanities elective	3-5
Biology 551, 552	4+4
Psychology 501 or 601	3 or 5
Psychology 709	4
Psychology 755 or 756	4
Social Science elective	9
H&PE 700	1
H&PE 750 (Men)	2
H&PE 540 (Women)	1
H&PE 541 (Women)	1
H&PE Officiating elective	2
H&PE elective activity	
(Women)	4
(Men)	8

THIRD YEAR	Hrs.
Education 704, 706, 708	3+3+4
H&PE 761, 762	2+2
H&PE 765	4
H&PE 780	2
H&PE 785 (Women)	2
H&PE 791	4
H&PE 795	4
H&PE Coaching (Men)	4
General electives†	
(Men)	12
(Women)	17

FOURTH YEAR	Hrs.
Education 843	15
H&PE 860	4
H&PE 890	4
H&PE 895	3
H&PE 896	4
H&PE 897 (Men)	2

†Electives should be applied toward minor field.

H&PE 850, 855 or 880	7-8
General electives†	
(Men)	8
(Women)	7

500R. *Field Hockey.* Methods and practice of skills, techniques, rules, and strategy of field hockey. 1 q.h.

501R. *Soccer.* Skills, techniques, strategy, and rules of soccer. 1 q.h.

502R.* *Volleyball.* Skills, techniques, rules, and strategy of volleyball. 1 q.h.

503R.* *Basketball.* Development of fundamental skills and techniques in basketball. Offensive and defensive team play and strategy. 1 q.h.

504R. *Softball.* Skills, techniques, rules, and strategy of softball. 1 q.h.

505R. *Touch Football.* Skills, rules, and techniques of touch football. 1 q.h.

506R. *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 non-skater. Classes held at Mill Creek Park Skating Rink. 1 q.h.

510R. *Archery.* Techniques of target archery. Selection, care, and repair of equipment. 1 q.h.

511R.* *Badminton.* Skills, mechanics, and rules of badminton. 1 q.h.

512R. *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.

513R. *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.

514R.* *Fencing I.* Fundamentals of foil fencing. Methods of attack and parry, and elements of bouting and judging. 1 q.h.

515R.* *Fencing II.* Intermediate techniques and strategy of foil fencing and bouting. Prereq.: Fencing I or consent of instructor. 1 q.h.

516R.* *Gymnastics I.* Stunts and tumbling. Fundamentals and methods of stunts and tumbling with gymnastic conditioning. 1 q.h.

517R.* *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.

518R.* *Gymnastics III.* Intermediate to advanced apparatus. Advanced methods, skills, and techniques of apparatus and floor exercise. Prereq.: Gymnastics II or consent of instructor. 1 q.h.

520R. *Golf I.* Fundamental skills of golf. Includes grip, stance, swing patterns, and putting as well as rules of course play. 1 q.h.

521R. *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.

522R. *Tennis I.* Fundamental skills of tennis including forehand and backhand drives and service. Basic rules, strategy, and methods. Classes meet at Mill Creek Park. 1 q.h.

523R. *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.

524R.* *Conditioning and Exercise Programs.* Program designed to meet individualized needs for weight control, relaxation, fitness, conditioning, or corrective activity. Student selects type of program to meet personal needs. 1 q.h.

525R.* *Wrestling.* Basic techniques of wrestling. Offensive and defensive maneuvers, methods, rules, and officiating. 1 q.h.

526R. *Riflery.* The safety and practice of handling a rifle. Target shooting in prone, kneeling, and standing positions. A fee is charged for ammunition. 1 q.h.

527R.* *Handball and Squash.* Rules and techniques for singles and doubles play in handball and squash. Strategy and skill development is emphasized. 1 q.h.

528R.* *Physical Conditioning.* An organized conditioning program designed to improve fitness. The course will consist of circuit training, weight conditioning, running, and various exercise experiences. 1 q.h.

†Electives should be applied toward minor field.

*Course requires locker and towel fee.

*Course requires locker and towel fee.

529R.* *Recreational Games.* Fundamentals, skills, techniques, strategy, and rules of racquetball, paddle tennis, table tennis, shuffleboard, and other recreational games. 1 q.h.

530R.* *Aquatics I.* Beginning swimming. Introduction to swimming and personal water safety. Treading, floating, sculling, and the basic strokes. Prereq.: Non-swimmer. 1 q.h.

531R.* *Aquatics II.* Intermediate swimming. Instruction in the crawl, sidestroke, breaststroke, and variations. Surface diving, aquatic games, and beginning diving. Emphasis is on form and endurance. Prereq.: Ability to swim in deep water. 1 q.h.

532R.* *Aquatics III.* Advanced swimming. Refinement of strokes and variations. Introduction to competitive swimming, synchronized swimming, and springboard diving. Survival techniques, use of mask, snorkle and fins, and elementary lifesaving skills. Prereq.: Ability to swim four strokes well. 1 q.h.

533R.* *Competitive Swimming.* Refinement and variations of the four basic strokes used in racing competition. Racing dives and close course turns. Organization and conduct of meets. Prereq.: Advanced swimmer. 1 q.h.

534R.* *Synchronized Swimming.* Fundamentals of synchronized swimming, stunts, and aquatic art. Individual and group work on selection and development of swimming and routines. Prereq.: Intermediate swimmer. 1 q.h.

535R.* *Diving I.* Fundamentals of springboard diving concentrating on the one-meter board. Prereq.: Intermediate swimmer. 1 q.h.

536R.* *Diving II.* Intermediate to advanced springboard diving at one and three meters. Prereq.: Diving I or consent of instructor. 1 q.h.

540R.* *Modern Dance I.* Elementary techniques of body movement. Rhythmic fundamentals and improvisation. 1 q.h.

541R. *Modern Dance II.* Intermediate dance techniques, composition, and improvisation. Prereq.: Modern Dance I or consent of instructor. 1 q.h.

542R.* *Dance Composition.* Selection of theme, accompaniment, and choreography of the dance. Prereq.: Modern Dance II or consent of instructor. 1 q.h.

*Course requires locker and towel fee.

545R. *Folk and Square Dance I.* European and Mediterranean folk dances. American square dances, and mixers. Beginning materials and practice. 1 q.h.

546R. *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.

549R.* *Varsity Competition.* Credit towards the University physical education activity requirement may be obtained through competition in the varsity athletic and women's extramural programs. Three credit hours maximum allowable. Prereq.: Consent of the coach. 1 q.h.

556R. *Baseball-Softball.* Teaching methods and practice of skills, techniques, and strategy of baseball and softball. Rules of each. Prereq.: HPE major. 1 q.h.

560R.* *Archery-Badminton.* Fundamental to advanced skills, mechanics, methods, and rules of badminton and target archery. Prereq.: HPE major. 1 q.h.

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.

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.

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

*Course requires locker and towel fee.

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.

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.

631R.* *Water Safety Methods for Instructors.* Techniques for teaching swimming, diving, survival swimming, lifesaving, and skin diving. Poolside first aid and introduction to pool maintenance and management. Red Cross Water Safety Instructor's certificate granted upon satisfactory completion of course. Prereq.: Current Lifesaving certificate. 3 q.h.

632R.* *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 diving. Prereq.: Lifesaving certificate or consent of instructor. 3 q.h.

633R.* *Water Polo.* Skills, organization, rules, and strategy of water polo. Prereq.: Advanced swimming. 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.

652. *Techniques of Officiating Field Hockey and Soccer.* Analysis and interpretation of rules; theory and practice of officiating field hockey and soccer. Prereq.: HPE 500R and HPE501R 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.

654. *Techniques of Officiating Softball.* Analysis and interpretation of rules; theory and practice of officiating softball. Prereq.: HPE 504R or equivalent. 1 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; theory and practice of judging gymnastics. Prereq.: HPE 517R or equivalent. 1 q.h.

659. *Techniques of Officiating Baseball.* Analysis and interpretation of rules; theory and practice of officiating baseball. 2 q.h.

690. *Personal Health Problems.* 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.

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.* Methods and materials for health instruction; first aid procedures; use and administration of health services; maintenance of healthful living conditions in schools; recognition of common disorders in children. *Not open to Health or Health and Physical Education majors or minors.* Prereq.: HPE 590 and junior standing. 4 q.h.

722.* *Physical Education in Elementary Grades for the Classroom Teacher.* Prin-

*Course requires locker and towel fee.

*Course requires locker and towel fee.

ciples, methods, materials, and organization of basic movement activities for the elementary school child. Includes games, rhythmic activities, stunts, and skill development. Active participation required. Prereq.: Third-quarter sophomore standing and HPE 622. 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, and techniques of teaching and coaching baseball. Prereq.: HPE 750. 2 q.h.

752. *Coaching of Basketball.* Theory, 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.

761.* *Elementary Physical Education Foundations.* Fundamental skills and analysis correlating the study of basic movement to movement education in relation to children. Lesson planning to develop cognitive, affective, and psychomotor concepts. Prereq.: 10 activity credits. 2 q.h.

762. *Elementary Physical Education Methods.* Principles, methods, and materials for the elementary level teacher. Includes curriculum planning, observation, and teaching experiences. Prereq.: 10 activity credits and HPE 761. 2 q.h.

765.* *Physical Education in the Secondary Schools.* Principles, objectives, methods, materials, and curriculum development for the teaching of physical education in the secondary schools. Observational experiences provided. Prereq.: 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.

792. *Teaching of Sex Education: Methods and Materials.* To prepare teachers of sex education in the elementary and secondary schools. Emphasis upon human sexuality, human reproduction, and responsible family living. Prereq.: HPE 590 and junior standing. 3 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.

797. *Camping and Outdoor Education.* Theory and practice of primitive to modern camping. Includes: selection, care, and handling of equipment; selection and preparation of campsites, recognition and preservation of wildlife in its natural habitat. 4 q.h.

850. *History, Principles and Philosophy of Physical Education.* Scientific, sociological, 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 edu-

*Course requires locker and towel fee.

*Course requires locker and towel fee.

cation 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.

890. *School Health Education.* Principles, planning, teaching methods, organization, and administration of health education in elementary and secondary schools. Prereq.: HPE 791 and health or physical education major. 4 q.h.

891. *Evaluation and Curriculum Development in Health.* Designed for the health education major. The development and organization of a health curriculum and the evaluation of all aspects of a school health program including education, administration, services, and environment. Prereq. or concurrent: HPE 890. 4 q.h.

895. *Adapted Physical Education.* The organization of physical education activities selected to meet the individual needs of the atypical student. Evaluation of therapeutic exercises and activities. 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. 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 D. M. Behen, Roberts, Skardon, and Slavin; Associate Professors Blue, L. Domonkos, and Huang; Assistant Professors Satre (chairman), Amadi, Beelen, Berger, Darling, Earnhart, Friedman, Jenkins, Kulchycky, May, Ronda, and A. Smith.

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 his courses with assistance from his 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, 730, 731, 732, 733, 736, 738, 739, 741, 742, 744, 745, 746, 747, 748, 749, 788, 801.

GROUP C—Select three courses from the following courses:
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—Select three courses from the following courses:
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.

Students transferring 30 or more quarter hours in history to YSU from another institution must, in addition to meeting the group requirements listed above, select at least five additional courses from either of Groups B, C, or D to obtain a major in history for graduation.

It is recommended that the student in choosing his 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

600. *American History.* Identical with Military Science 600. 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.

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.: 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.: 605. 4 q.h.

704. *Federal Period.* An intensive study of the Age of Jefferson and Jackson covering the period 1789 to 1840. Prereq.: 605. 4 q.h.

706. *Middle Period of American History.* An intensive study of the deepening sectionalism of the country culminating in the outbreak of the Civil War. Prereq.: 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.: 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.: 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.: 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.: 606. 4 q.h.

715, 716. *Economic History of the United States, I, II.* An 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.: 605 for 715, 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.: 605 for 717, 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.: 605 for 720, 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.: 605 or 606. 4 q.h.

730, 731. *Black Man in American History, I, II.* An 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.: 605 for 730, 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.: 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.: 605. 4 q.h.

735. *Urban History.* A survey of the history of cities in Western Europe to the Industrial Revolution. Prereq.: 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.: 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.: 605 for 738, 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.: 605 for 741, 606 for 742. 4+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.: 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.: 605, 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.: 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.: 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.: 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.: 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, Caesaropapism, Benedictine Monasticism, and early feudalism. Prereq.: 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.: 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.: 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.: 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.: 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.: 656. 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.: 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.: 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 interaction of democracies, Fascisms, and Stalinism in the making of the Cold War and World War II. Prereq.: 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.: 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.: 662 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.: 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.: 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.: 662 or consent of instructor. 4 q.h.

777, 778. *History of the 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.: 655 for 777, 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.: 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.: 655 for 780, 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.: 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.: 655 for 783, 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.: 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.: 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.: 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.: 656. 4+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 sixteenth and seventeenth centuries. Prereq.: 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.: 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.

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.: Consent of instructor. 4 q.h.

812. *History of South America.* The Spanish American republics and Brazil are considered. Prereq.: Consent of instructor. 4 q.h.

813. *History of Latin America.* 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. Previous study of Latin-America is recommended. Prereq.: 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.: 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.: 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.: 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.

HOME ECONOMICS

The Department of Home Economics offers several baccalaureate degree programs. For details see *Home Economics,* Technical and Community College section.

HUMANITIES

Associate Professors Hare and Ives (advisor); Assistant Professors L. Baird and Henke; 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.

A prerequisite for any Humanities course is English 551 or its equivalent.

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. Prereq.: English 551 or its equivalent. 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. Prereq.: English 551 or its equivalent. 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. Prereq.: English 551 or its equivalent. 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 (except 708, 709, 710); 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 Classical 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 twentieth-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.

Lower Division Courses

See pages 42 and 62 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.

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.

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. 4 q.h.

JOURNALISM

Assistant Professor Alderman; Instructor Martindale; English Department staff.

The University does not offer a major in journalism, but enables a student, with the advice and approval of his 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 give full credit in English.

Upper Division Courses

715. *Journalism I.* News reporting and writing. The news room in newspaper production. Prereq.: English 527 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 professor. Listed also as English 716. 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 3 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 27 hours of Latin above the elementary level, including Latin 804, plus 18 hours of Latin, ancient Greek, and/or other courses acceptable in relevance and level to the department chairman. The inclusion of at least 9 hours of ancient Greek is strongly recommended.

Students who plan to teach high school Latin must complete 30 hours of Latin above the elementary level, including Latin 804 and Latin 809.

Lower Division Courses

See pages 42 and 62 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. 3+3+3 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 C. Dykema and Hankey; Associate Professor Secrist; Assistant Professors Bunnag, Knapp, and Viehmeyer; English Department staff; Foreign Languages and Literatures Department staff.

The University does not offer a major in linguistics, but enables a student, with the advice and approval of his major advisor, to elect a minor in linguistics. The student planning such a minor should consult his major advisor, especially to determine whether a course offered in both linguistics and his 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 social behavior and social institutions. Prereq.: English 527 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. 5 q.h.

756. *History and Structure of English.* Identical with English 756. 5 q.h.

859. *Selected Topics in Linguistics.* A study in depth of a concept or problem in linguistics. The topic is announced each time the course is offered. May be repeated when the topic is varied. Prereq.: English 755 or consent of the instructor. 3-5 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.

885. *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 Zaccaro (chairman), Dillon, and Malak; Associate Professors Barger, Ciotola, Demen, Hurd, Jonas, Mavrigian, and Santos; Assistant Professors Altinger, Biles, Brown, Buoni, Burden, Cleary, Faires, Goldstein, Helling, Klein, Knauf, Kozarich, Mortellaro, Poggione, Rodfong, Subramanian, and Whipkey.

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 of which 34 quarter hours are specified and 14 quarter hours are elective.

Specified required courses are Mathematics 571, 572, 673, 674, 701, 727, 740, 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 his electives with assist-

ance from his 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.

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 5 quarter hours to complete the requirements for the degree. 5 q.h.

501. *Geometry I.* 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 5 quarter hours to complete the requirements for the degree. 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 functions; solutions of linear and quadratic equations. Prereq.: One unit of high school algebra and one unit of high school geometry or Mathematics 500 and 501. 5 q.h.

503. *Trigonometry.* 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 502. 5 q.h.

505. *Elementary Function Theory.* A study of algebraic and transcendental functions, including special topics from intermediate analytic geometry, the theory of equations, and modern algebraic structures. Prereq.: Three high school units of college preparatory mathematics including trigonometry, or Math 502 and 503, or the consent of the teacher. 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 in 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.

540. *Probability and Statistics.* See Mathematics 714.

542. *Special Topics of Algebra.* A course dealing with topics of algebra that find great use in modern applications. The course is especially designed for business students but is open to others. Special topics may include logic, sets, Boolean algebra, logarithms, exponential functions, linear programming, matrices and determinants, progressions, permutations and combinations, probability, and mathematics of investment. Prereq.: One unit of high school geometry, two units of high school algebra, or Mathematics 502. 5 q.h.

550. *Introduction to Calculus.* A short course in calculus of algebraic functions of

one variable with applications. The course is intended for students in business, 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, 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. Analytical 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 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 502 and 503 are required for Mathematics 571. 571 is required for 572 and 572 is required for 673 and 673 is a requirement for 674. 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 Math. 571, 572, 673, 674 sequence provides. A detailed study of limits, derivatives, and integrals 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.

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.

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 teacher. 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 674. Mathematics 705 is required 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 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, 728. *Abstract Algebra I, II.* Number systems, groups, integral domains, fields, vector spaces, congruences, and polynomial rings. Prereq.: Mathematics 673 or consent

of teacher is required for Math 727. Mathematics 727 is required for Math 728. 4+5 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.

740, 741, 742. *Mathematical Statistics I, II, III.* An introduction to the theory of probability and statistics using the concepts and methods of calculus. Includes discrete and continuous probability models, random variables and their distribution, sampling distributions, estimations, tests of hypotheses, regression, and analysis of variance. Prereq.: Mathematics 674 is required for Math 740. Mathematics 740 is required for 741 and 741 is required for 742. 3+3+3 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 of finite differences, interpolation methods, numerical differentiation and integration, least squares techniques. Prereq.: Mathematics 674. 4 q.h.

842. *Statistical Inference.* The study of estimation, hypothesis testing, non-parametric methods and design of experiments. Emphasis on applications. Prereq.: Mathematics 742. 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; law of large numbers; limit theorems, generating functions; introductory topics of stochastic processes; applications. Prereq.: Mathematics 740 or consent of teacher is required for Mathematics 843. Mathematics 843 is required for Mathematics 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 740 and 725 or consent of teacher. 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 teacher. 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 teacher. 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 4 quarter hours of mathematics at 700- or 800-course level, or consent of teacher. 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.* A required course for mathematics majors. Prereq.: Senior standing. 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

The computer science curriculum is designed to provide students with the broadest possible practical and theoretical background in computational methods consistent with their academic objective. This background is intended to prepare students to enter skilled positions in industry, to provide them with a tool to assist them in quantitative study in their own discipline, and to prepare them to pursue advanced

coursework in computation. A minor in computer science may be obtained by completing a minimum of 21 hours of the following courses with a grade of *C* or better.

Lower Division Courses

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 teacher. 4 q.h.

601. *Advanced Programming.* Advanced problem solving techniques using problem-oriented and machine-oriented languages. General lectures with laboratories specialized to scientific or data processing applications. Prereq.: Computer Science 600, Mathematics 550 or 673. 5 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.

701. *Systems Programming I.* Techniques for constructing assemblers and compilers for computer languages. Prereq.: Computer Science 700. 5 q.h.

702. *Systems Programming II.* Techniques for constructing computer operating systems. Prereq.: Computer Science 701. 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.

820. *Simulation and Artificial Intelligence.* Methods for modeling discrete systems by algorithmic and heuristic approaches. Prereq.: Computer Science 700. 5 q.h.

830. *Computational Linguistics.* Computer methods of translating natural and artificial languages. Prereq.: Computer Science 601. 5 q.h.

MEDICAL TECHNOLOGY

Students majoring in medical technology are advised in the Chemistry Department. After completing three years of study on the campus and one year of training in an accredited hospital, they will be granted a Bachelor of Science degree. Consult Chemistry Department section for curriculum.

MILITARY SCIENCE

Lt. Colonel Longacre (chairman), professor; Captain Adams, Captain Wilkinson, Captain Goodell, Captain Lucas, assistant professors; Sergeant Major Moss, Master Sergeant Fairchild, Staff Sergeant Harding, Staff Sergeant Shultz, other Army Staff.

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 distinguishes himself 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 States 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 to him, at the end of the academic year, when he turns in the government property issued to him (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: he may enroll 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 to receive credit for the advanced course.

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 23;

(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 is paid a retainer fee of $100.00 a month during the period that he is enrolled, except for the six-week period that he is attending the advanced summer camp (normally between his 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 2 years' service, plus 6 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.

To qualify for the two-year program the student must apply for enrollment during his sophomore year in college or in junior college, complete an R.O.T.C. questionnaire, pass a screening examination and a physical examination, and be selected for participation. If he is selected he 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, plus 6 cents a mile for travel to and from camp. When the student has met these requirements and has successfully completed the basic training camp he is eligible to enroll in the R.O.T.C. advanced course in his 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 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. Only students who participate in the four-year program are eligible.

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. 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, and Branches of the Army. One hour of lecture and one hour of leadership laboratory which includes a two-day (weekend) field exercise. 1 q.h.

In addition, the Department of the Army requires the student enrolled in this course to take a minimum of three quarter hours during his freshman year in the areas of effective communication, science or mathematics, or psychology, to be determined in consultation with the chairman of the Department of Military Science. Courses of one, two, or three quarter hours in these areas may be chosen; they may be courses required for a degree, or electives.

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. Three hours lecture per week plus one 3-hour practical exercise. 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 and a half hours of lecture and one hour of leadership laboratory which includes a two-day (weekend) 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 instruction; speech for instructors; production and use of training aids. Two hours of lecture 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 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 per week. 2 q.h.

704. *Advanced R.O.T.C. Summer Camp.* Six 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 chairman. 3 q.h.

In addition, the Department of the Army requires the student enrolled in this course to take a minimum of five quarter hours in the areas of science or mathematics, psychology, or political science, to be determined in consultation with the chairman of the Department of Military Science. They may be courses required for a degree, or electives; normally, however, they must be Upper Division courses.

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 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 affairs, and other related subjects. Lecture and case studies are utilized. Two hours 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 aptitude for the conduct of war of each major world power, block of nations and geographic area. Three hours of lecture and one-half hour of leadership laboratory which includes a two-day field exercise. 3 q.h.

In addition, the Department of the Army requires the student enrolled in this course to take a minimum of five quarter hours in the areas of effective communication, science or mathematics, psychology, or political science, to be determined in consultation with the chairman of the Department of Military Science. They may be courses required for a degree, or electives; normally, however, they must be Upper Division courses.

Leadership Laboratory

This practical exercise period conducted for an 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 Basic R.O.T.C. Summer Camp or one year of active military service.

NURSING

Students wishing to enter either the two-year associate degree program, or Registered Nurses enrolling in the baccalaureate program should consult with the chairman of the Nursing Department in the Technical and Community College. Details are listed in the Technical and Community College section of the catalog.

Registered Nurses enrolled in the baccalaureate program prior to September 1971, may continue to be advised in the Office of the Dean of Arts and Sciences, although they are urged to consider the advantages of transferring to the new program.

PHILOSOPHY AND RELIGIOUS STUDIES

Professors Greenman (chairman) and Lucas; Associate Professor Reid; Assistant Professors Eminhizer and Shipka.

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 nineteenth 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.

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 Naturalistic. 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.

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 extrapolitical 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 twentieth 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 contemporary 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 8 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 his particular philosophical interest. The subjects for the seminar will include ethics; logic; aesthetics; value theory; epistemology; metaphysics; language analysis; etc. Prereq.: Philosophy 600 and 8 quarter hours of Upper Division philosophy courses or approval of the department chairman. 1-3 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 usage; 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.

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.

PHYSICAL EDUCATION

See *Health and Physical Education.*

PHYSICS AND ASTRONOMY

Professors Ellis and McLennan; Associate Professors Dalbec, Hanzely (chairman), and Young; Assistant Professors Bishop, Cochran, Fisher, Mooney, and Moorhead.

Physics courses are organized with the following aims: (1) to acquaint the non-specializing student with scientific methods and with the place of physics in the modern world; (2) to provide basic training for engineering and pre-professional students; (3) to provide well-rounded training in physics for those needing it for secondary school teaching, industry, or graduate study.

Following the course descriptions below are the curriculums required for the degrees of Bachelor of Arts and Bachelor of Science with the major in physics. A student desiring to teach physics in the public schools should consult the Dean of the School of Education.

The B.A. degree program is designed for students who do not plan to continue their studies beyond the bachelor's degree. The B.S. degree program is designed for the student who plans to pursue his studies beyond the bachelor's degree. The minimum requirements for these degrees are shown at the end of the course descriptions.

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 an historical context of some of the successes and failures of physicists in their efforts to describe our universe in terms of functional relationships. Prereq.: None for 500A; for 500B: 500A or consent of instructor. 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. 4+3+3 q.h.

502L, 503L. *Fundamentals of Physics Laboratory I, II.* Two hours per week. Taken concurrently with Physics 502 and 503. (W,Sp) 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. 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 calculus con-

*Must be taken in sequence.

current course in mechanics; the kinetics and dynamics of masses in translation; Newton's Laws; the conservation laws of energy and momentum. Prereq. or concurrent: Mathematics 571. (F,W,Sp) 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. Not applicable toward a major in physics. (W,Sp) 4 q.h.

610. *General Physics II.* A study of the properties of wave motion, reflection, refraction, diffraction, interference, polarization; as exemplified by mechanical and electromagnetic waves; energy transferred by wave motion; simple harmonic motion. Prereq.: Physics 510. Prereq. or concurrent: Mathematics 572. (W,Sp) 4 q.h.

611. *General Physics III.* A study of static electric and magnetic fields; direct current circuits; induced currents and electromagnetic forces; inductance and capacitance and their transient effects on direct current circuits. Prereq.: Physics 510 and 610. Prereq.: or concurrent: Mathematics 673. (Sp,Su) 4 q.h.

610L, 611L. *General Physics Laboratory II, III.* Three hours per week taken concurrently with Physics 610 and 611. These laboratories are elective courses for engineering students. (W,Sp) 1+1 q.h.

Upper Division Courses

Note: Satisfactory completion of the general physics sequence 510, 610, 611 and Mathematics 674 is the minimum prerequisite for all Upper Division courses in physics; or consent of instructor.

700. *Physics Literature.* A study and discussion of the growth of Physical theory based on the originals of selected famous papers in Physics. Prereq.: Physics 704 and 705. 1 q.h.

701, 702, 703.* *Intermediate Classical Mechanics I, II, III.* Elements of vector algebra and vector calculus. Statics and dynamics of a particle and of a rigid body. Inertial and accelerated coordinate systems. Prereq.: Physics 611. Prereq. or concurrent: Mathematics 705. (F,W,Sp) 3+3+3 q.h.

704, 705.* *Introduction to Modern Physics I, II.* Selected topics in atomic, nuclear physics, special relativity, and nuclear reactions. Prereq.: Physics 611 and Mathematics 674. (W,Sp) 3+3 q.h.

704L, 705L. *Modern Physics Laboratory I, II.* The material for this laboratory course is selected from those experiments in atomic and nuclear physics that have laid the foundation and provided the evidence for modern quantum theory. Three hours laboratory per week taken concurrently with Physics 704, 705. (W,Sp) 1+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 and Mathematics 673. (W) 3 q.h.

710L. *Heat Lab.* Experiments to aid the understanding of pressure, volume, temperature relations, specific heats, kinetic theory, and energy relations. Prereq. or concurrent; Physics 710. (W) 1 q.h.

711, 712. *Thermodynamics and Statistical Mechanics I, II.* An advanced undergraduate-level course in 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. 3+3 q.h.

722. *Physical Optics and Advanced Light.* Elementary theory of thick and thin lenses; interference, diffraction, polarization of light: wave surfaces and the resolving power

*Must be taken in sequence.

*Must be taken in sequence.

of optical instruments. Prereq.: Physics 611 and Mathematics 674. 4 q.h.

722L. *Physical Optics Laboratory.* Experimental emphasis on physical optics: wave propagation, interference, diffraction, refraction, dispersion, polarization, and analysis of line spectra. Three hours a week concurrent with Physics 722. 1 q.h.

730, 731, 732.* *Intermediate Electricity and Magnetism I, II, III.* A three-quarter sequence beginning with A.C. theory and transients. Electrostatics and magnetostatics; properties of material media and an introduction to Maxwell's equations. Prereq.: Physics 611 and Mathematics 705. 3+3+3 q.h.

730L, 731L, 732L. *Intermediate Level Electricity and Magnetism I, II.* Laboratory work in A.C. circuits, steady state and transients, non-linear, circuit elements, and transducers. Three hours laboratory per week taken concurrently with 730, 731, 732. 1+1+1 q.h.

750. *Mathematical Physics.* The mathematical techniques required in the study of classical, statistical, and quantum mechanics, and the area of field theory. Prereq.: Physics 702 and Mathematics 706. 3 q.h.

800. *Physics Seminar.* The reading of current papers in physics and the presentation of reports on current research both in and out of the department. Prereq.: Senior standing in the Physics Department and approval of the chairman. May be repeated once. 1 q.h. each quarter

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 a week. Prereq.: Physics 701, 702; 704, 705; and senior standing. 2+2+2 q.h.

810, 811.* *Introduction to Quantum Mechanics I, II.* The postulates of wave mechanics, the Schroedinger wave equation, and solutions for elementary problems in quantum theory. Prereq.: Physics 702 and 705; Mathematics 706. 3+3 q.h.

822. *Electricity and Magnetism.* Time dependent fields and currents; Maxwell's equations; electromagnetic radiation; vector methods are used extensively. 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 810, 811 and Mathematics 705. 3 q.h.

826L. *Nuclear Physics Laboratory.* Basic experiments in nuclear physics designed to supplement the text material concerning nuclear structure and nuclear reactions. Three hours of laboratory each week. Taken concurrently with 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.* Introduction to atomic, molecular, and x-ray spectra. Prereq.: Permission of instructor. 4 q.h.

835L. *Spectroscopy Laboratory.* Basic experiments in spectroscopy designed to supplement Physics 835. Three hours of laboratory per week. Prereq. or concurrent: Physics 835. 1 q.h.

850. *Special Topics in Physics.* The study of a standard topic at greater depth, or 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 is the suggested curriculum for the first two years for any degree based on a major in physics. Complete four-year programs for all options are available at the physics office.

The student is urged to come to the physics office early in his first year to select, and consult with, an advisor from the physics staff.

FIRST YEAR

FALL QUARTER	Hrs.
Physics 510 General Physics I	4
Soc. Sci. 501 Introduction to the Social Sciences	3
Math. 571 Analytic Geometry and Calculus I	5
Chem. 515 General Chemistry	4

*Must be taken in sequence.

WINTER QUARTER	Hrs.
Physics 610 and 610L General Physics II	5
Soc. Sci. 502 Introduction to Economics	3
Math. 572 Analytic Geometry and Calculus II	4
Chem. 516 General Chemistry	4

SPRING QUARTER	Hrs.
Physics 611 and 611L General Physics III	5
Soc. Sci. 503 Introduction to Political Science	3
Math. 673 Analytic Geometry and Calculus III	5
Chem. 517 General Chemistry	4

SECOND YEAR

FALL QUARTER	Hrs.
Physics 710 and 710L Thermodynamics	4
English 550 Basic Composition I	4
Math. 674 Analytic Geometry and Calculus IV	4
Foreign Language	4
Health and Physical Education Activity	1

WINTER QUARTER	Hrs.
Physics 704 and 704L Introduction to Modern Physics	4
English 551 Basic Composition II	4
Math. 705 Differential Equations I	4
Foreign Language	4
Health and Physical Education Activity	1

SPRING QUARTER	Hrs.
Physics 705 and 705L Introduction to Modern Physics	4
Elective	4
Math. 706 Differential Equations II	4
Health and Physical Education 590 Health Education	3
Health and Physical Education Activity	1

Minimum requirements for the B.A. degree in physics with a minor in mathematics: Physics courses, 47 q.h.: 510, 610+L, 611+L, 710+L, 704+L, 705+L, 701, 702, 703, 730+L, 731+L, 732+L. 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, 68 q.h.: same as the B.A. above plus courses 711, 712, 750, 805, 806, 807, 810, 811. Mathematics courses 26 q.h.: same as above plus course 706.

Note: The thirty (30) hours of liberal arts electives are to be divided as follows:

SOCIAL STUDIES—20 HOURS

Social Sciences	Psychology
Economics	Sociology

HUMANITIES—10 HOURS

Philosophy	Art or Music
Language	History
Literature	

For complete information on required courses for these degrees, see the section of this catalog which is indexed as *Requirements for Degrees; College of Arts and Sciences.*

Astronomy

Associate Professor Young (supervisor); Assistant Professor Bishop.

A student who wishes to prepare for graduate work in astronomy should major in physics and minor in astronomy.

Lower Division Courses

504. *Descriptive Astronomy.* A survey of the solar system and stars. Credit for this course may be applied towards fulfillment of the 16-hour general science requirement. 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.: Mathematics 674 and Physics 603 or 611. 3+3+3 q.h.

800, 801, 802. *Observational Astronomy I, II, III.* Observational techniques in astronomy. The University telescopes and auxiliary equipment will be used. Prereq.: Mathematics 674 and Physics 603 or 611. 3+3+3 q.h.

POLITICAL SCIENCE

Professor Sterenberg; Associate Professor Boyer (chairman); Assistant Professors Binning, Esterly, and Redburn.

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,

*Note: These courses may be used to complete a physics minor.

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 approach 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.: Poltical 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.

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 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. Prereq.: Political Science 601. 3 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.

741. *The Government of the Soviet Union.* An examination of the ideology, institutions, and policies of the Soviet Communist system as a background for understanding the Soviet totalitarian challenge to American democracy. Prereq.: Political Science 640. 3 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. 3 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 twentieth century. Prereq.: Political Science 660. 3 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. 3 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. 3 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. 3 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 teacher. 3-6 q.h.

840. *Select Problems, Comparative Government.* This course may be repeated once. Prereq.: Consent of teacher. 3-6 q.h.

860. *Select Problems, International Relations.* This course may be repeated once. Prereq.: Consent of teacher. 3-6 q.h.

880. *Select Problems, Political Thought.* This course may be repeated once. Prereq.: Consent of teacher. 3-6 q.h.

Social Science

Assistant Professors Dale, Eichenberger, and Gonzalez; Instructors Haushalter, Hudzik, and 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 economic 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.) 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.) 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, geography, 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 8 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.

PRE-FORESTRY

Pre-forestry students are advised by the Biological Sciences Department which maintains close liaison with neighboring forestry schools in order to plan programs of study at YSU which will transfer toward forestry majors elsewhere. See Biological Sciences, page 72, for a suggested program.

PRE-LAW STUDY

Department of Political Science, Advisement.

Pre-law advisement is available at the beginning of the student's college study to acquaint him with the various fields of legal practice which require specialized undergraduate study, and in his junior year to arrange for law school entrance examinations and interviews.

There are no prescribed majors for the pre-law student. He has the options of a single discipline major, the American studies major, or the combined major in social studies. 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 Youngstown 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 rigorous requirements.

*The student seeking teacher certification must choose history as one of his category A options, must meet specific course requirements in history and sociology, and must have a total of 90 hours in combined major disciplines.

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 publishes 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 or in the Biological Sciences 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 he wishes. However, the latter is recommended only for students who can maintain extremely high grade averages.

Careers Related to Medical Profession

More than 200 technical careers exist in areas related to delivery of medical services. Medical secretary, microbiologist, medical illustrator, dental assistant, physician assistant, physical therapist, inhalation therapist and cytologist are but a few of these. See advisors in the Biological Sciences Department for information concerning training for these careers.

PSYCHOLOGY

Professors S. N. Hotchkiss (chairman) and Beckman; Associate Professors S. M. Hotchkiss and Sweeney; Assistant Professors Atkinson, Cunningham, Graf, Guterba, Krause, Masaki, and Morrison; Instructors Quinby and Werbner.

Psychology offers appropriate majors for students seeking: (1) a general liberal arts degree; (2) a terminal degree for paraprofessional employment; (3) certification with an A.B. degree to teach psychology in the secondary schools; and (4) preparation for graduate study in psychology. A basic major consists of 48 quarter hours of psychology which must include Psychology 601, 613, 615, and 723 plus an additional 33 quarter hours in psychology selected from courses designated as being applicable to the major. Students contemplating graduate study should consult this department to determine which courses will best meet their individual needs.

As a major, psychology is primarily an Upper Division program. Prospective majors are advised to concentrate upon the completion of the University and college requirements during their freshman and sophomore years.

Psychology 601 is the required first course for the major and is recommended for the minor. (Psychology 501 is not a prerequisite for Psychology 601, is not recommended for the minor, and is not applicable to the major.)

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 (*) may not be offered every year.

550. *Improvement of Adult Reading Ability.* Stresses techniques involved in the improvement of reading skill for adults; of interest to those wishing to improve their own reading ability. Meets two hours per week and is counted as two quarter hours for load and billing purposes. *Credits from this course cannot be used toward graduation.* Open to all students. 2 q.h.

Lower Division Courses

501. *Introduction to Psychology.* Gives an overview of psychology as the science of behavior; discusses major sub-areas and the activities of psychologists in each; presents basic principles of human behavior, development, and adjustment with a view to better understanding oneself and others. *Not a prerequisite for Psychology 601 and not*

applicable toward a major in psychology. (F,W,Sp) 3 q.h.

505. *Personal Adjustment.* Based upon a survey of the primary psychobiological, psychosocial, environmental, and experiential factors important to the development of the unique individual, this course seeks to help the student gain a greater understanding of himself, more self-awareness, self-acceptance and by this, a better understanding of others and greater capacity to work with others to achieve a realistic level of attainment. *Not applicable to the psychology major.* Prereq.: None. (F,W,Sp) 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.* Prereq.: None. (W) 3 q.h.

601. *General Psychology.* The basic principles of the scientific study of behavior, including the role of the biological and experiential factors in the development and modification of intelligence, emotion, motivation, and other important determinants and components of behavior. *Required for all psychology majors.* Prereq.: Sophomore standing or consent of chairman. (F,W,Sp) 5 q.h.

613. *Quantitative Methods in Psychology.* 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 501 or 601. (713) (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 601 and 613. (W,Sp) 3 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 major with consent of department chairman. Prereq.: Psych. 501 or 601. (F) 3 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 501 or 601 or Sociology 600. (F,W,Sp) 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 501 or 601. (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 601. (F,W,Sp) 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 musical aptitude and musical interest. *Not applicable to the psychology major.* Prereq.: Psychology 501 or 601. (F) (*) 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 501 or 601. (F,W,Sp) 3 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 501 or 601. (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 501 or 601. (F,W,Sp) 4 q.h.

711. *Applied Psychology.* An overview of psychological principles as used in various areas such as industry, law, advertising, consumer research, etc. *Not applicable to the psychology major.* Prereq.: Psychology 501 or 601. (F) 3 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 601, 613 and junior standing or Psychology 501, junior standing and consent of instructor. (F,W) 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.

723. *Statistical Methods in Psychology I.* 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 II.* A continuation of inferential statistics including complex analysis of variance and non-parametric 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.

735. *Psychology and Group Dynamics.* An 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. (W) 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 601, 613 or consent of instructor. (710) (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 601, 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 501 or 601. (705) (F,W,Sp) 4 q.h.

756. *Developmental Psychology II. (Adolescence.)* A study of human development from puberty to adulthood. *Applicable to the psychology major.* Prereq.: Psychology 501 or 601. (706) (F,Sp) 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 601. (W) 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 601, 613, 615, and 723 (may be concurrent). (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 601, 613, 615, and 723 (may be concurrent). (W)(*) 4 q.h.

762. *Verbal Learning and Memory.* This course provides an overview 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 601, 613, and 615. (Sp) 4 q.h.

765. *Experimental Social.* Examination of problems, principles, methods, and techniques underlying the investigation and development of theories of social psychology, participation in demonstrations, experimentation plus report writing. Applicable to the psychology major. Prereq.: Psychology 615, 700. (Sp) 4 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 3 q.h. may be applied to the psychology major.* One q.h. credit is given for each 3 hours/week of field work for 10 weeks of the quarter. May be repeated up to 6 q.h. credit. Prereq.: 12 hours in psychology and permission of instructor. (F, W,Sp) 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 Psych. 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 601. (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 601. (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 including Psychology 601 or consent of instructor. (W) 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.: Twenty hours of psychology including Psychology 601 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 601, 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 with 20 hours of Psychology 601, 613, and 740 plus consent of instructor. (F) 4 q.h.

814. *Individual Testing.* Administration, scoring, and interpretation of selected widely used individual tests of aptitude and achievement, exclusive of those covered in Psychology 815. *Applicable to the psychology major.* Prereq.: Senior psychology majors with 20 q.h. including Psychology 740 plus permission 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 601, 613, 740 and consent of instructor. (W) 4 q.h.

816. *Individual Testing: Practicum.* Supervised practicum in the application of individual tests; writing of reports and submission of same. *Applicable to the psychology major.* Prereq.: Psychology 814 or 815 plus consent of instructor. (Sp) 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 601, 700 and 723 or consent of instructor. (W) (*) 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. (Sp) 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.: Twenty hours of psychology including Psychology 601 or consent of instructor. (F) 4 q.h.

832. *The Psycho-Social Dynamics of Religion.* Identical with Religious Studies 832. *Applicable to the psychology major only with consent of chairman.* Prereq.: See Religious Studies 832. 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. (W) (*) 4 q.h.

834. *Applied Reinforcement Theory.* The second course in a two-course sequence in the experimental analysis of behavior; 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. Prereq.: Junior standing and Psychology 601 or 701 and consent of instructor. (Sp) 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) 4 q.h.

840. *History of Psychology I.* A review of the major forces of psychology from its antecedents through structuralism. *Applicable to the psychology major.* Prereq.: Senior major standing plus 20 hours of psychology

including Psychology 601 or consent of instructor. (722) (F) 3 q.h.

841. *History of Psychology II.* A review of the major trends of psychology from functionalism to the present. *Applicable to the psychology major.* Prereq.: Psychology 840 or consent of instructor. (830) (W) 3 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 3 q.h. but may be repeated twice as elective hours.* Prereq.: Senior major in psychology or consent of instructor. (F,W,Sp) 3 q.h.

860. *Individual Study.* The individual study of a special problem or a review of the literature relating to a specific psychological problem or issue. For the exceptional student. A written report is required, one copy of which will remain on file in the department. *Applicable to the psychology major.* Prereq.: Senior major. (821, 822) (F,W,Sp) 1-2 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 Psych. 601, 613, and 700 or consent of instructor. (W) 4 q.h.

PUBLIC RELATIONS

A suggested curriculum leading to the degree of Bachelor of Science in Business Administration with the major in advertising and public relations will be found in the School of Business Administration section. It may be added that in view of the many kinds of public relations work that exist, the student, especially if his interest is not primarily in business or industry, should also consult members of the faculties of English and of social sciences before planning a curriculum.

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.

Lower Division Courses

See pages 42 and 62 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 he has received credit for Russian 762. Prereq.: Russian 602 or equivalent. 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 influ-

ence 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. 4 q.h.

SOCIOLOGY AND ANTHROPOLOGY

Professor Dobbert; Associate Professors Kiriazis (chairman), Ducey, McDonald, and Muntean; Assistant Professors Cooper, Fry, Kassees, Moore, and White; Instructor Gartland.

The Department of Sociology and Anthropology offers a major in sociology, anthropology, or social work. It also offers minors in all three fields.

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 socialization, demography and ecology, and social deviance. 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. Prereq.: Soc.-Anth. 500.
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. 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. 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.

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. *Collective Behavior.* An analysis of the role of social movements, intellectual criticism, and socio-economic trends; study of the student movement, mobs, and crowd behavior. 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.

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.

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.* The physical origins of man and the biological bases of his social behavior. Prereq.: General Biology and Soc.-Anth. 602. 3 q.h.

715. *Physical Anthropology II.* A continuation of 714. The distribution of man into races and cultural groups as disclosed by paleontology and archaeology. Prereq.: Soc.-Anth. 714. 3 q.h.

716. *Anthropology: Maya, Aztec, and Inca Cultures.* The origins, cultures, and achievements of the classical civilizations of the New World: Aztec, Inca, and Maya. Prereq.: Soc.-Anth. 602. 3 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. *Anthropological 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. 3 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 description of human skeletal remains. Prereq.: Soc.-Anth. 602. 4 q.h.

800. *Social and Cultural Factors in Personality Development.* An analysis of the dynamic relationship between social structure and cultural patterns in the development of personality throughout the life process. Prereq.: Soc.-Anth. 602 or 705. 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 45 quarter hours. Majors must take Social Statistics 701, Social Research 751, and History of Social Theory 760, as well as Social Work 720, 721, and 725. The remaining hours are to be selected in sociology, anthropology, or social work.

Lower Division Course

630. *Criminology.* Identical with Criminal Justice 630. 4 q.h.

Upper Division Courses

720. *Introduction to Social Services.* A historical survey of the origins and nature of social services in Western civilization with emphasis on the United States. Prereq.: Soc.-Anth. 500. 3 q.h.

721. *Social Policy.* A survey of the programs, organization, functions, and inter-relationships of the various public and private social services in the United States. Visits to local agencies. Prereq.: Soc.-Anth. 720. 3 q.h.

722. *Introduction to Social Casework Methods.* Analysis of the major processes employed in social casework; the relation of these methods to other fields, such as nursing, teaching, legal counseling, personnel, and business administration. Prereq.: Soc.-Anth. 720. 3 q.h.

723. *Introduction to 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. 720. 3 q.h.

724. *Introduction to 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. 720. 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 a controlled educational experience in social

work. The student is required to spend 14 hours weekly in the agency, and 2 hours in seminar with faculty. Prereq.: Senior standing with 25 q.h. in social work and sociology. 6 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 a 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.

735. *Juvenile Delinquency.* Identical with Criminal Justice 735. 4 q.h.

SPANISH

A major in Spanish consists of 45 quarter hours above the elementary level, including Spanish 705, 706, and 717.

Lower Division Courses

See pages 42 and 62 for pre-college and college language requirements.

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.

602. *Intermediate Spanish II.* A continuation of 601. Prereq.: Spanish 601 or equivalent. 4 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.

655. *Conversational Spanish.* A course in oral Spanish, with the teacher 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. *Nineteenth 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 to 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 716 or consent of the instructor. 4 q.h.

836. *Modern Spanish-American Drama.* Study of the 20th-century dramatists. Prereq.: Spanish 716 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, depending on the topic. 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 teachers 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 *Biological 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, fashion or industrial or retail marketing, 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 Technical and Community College is also offered in most of the above areas of study. See the Technical and Community College section.

REQUIREMENTS FOR THE DEGREE

Bachelor of Science in Business Administration

It is the student's responsibility to see that he satisfies all the graduation requirements for the degree he seeks. 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, fashion marketing, industrial marketing, 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.*

NOTE: 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*).

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	6	
Psychology 501 Introduction to Psychology	3	
Electives*	8	
Science electives:		13
Science electives	8	
Mathematics 542 Special Topics of Algebra	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 (including the social science sequence courses), Psychology, and Sociology and Anthropology.

	Requirements
Liberal arts electives**	5
Health and Physical Education 590 Health Education	3
Health and Physical Education activity courses	3
	63

**The electives are specifically identified in each curriculum.

SCHOOL OF BUSINESS ADMINISTRATION CORE COURSES	Quarter Hours of Credit
Accounting 605, 606 Elementary Accounting I, II	10
Economics 704 Economics and Social Statistics I	4
Finance 720 Business Finance	4
Management 511 Introduction to Business	3
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, fashion or industrial or retail marketing, 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 familiarize himself 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 insure 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 for marketing.

ACCOUNTING AND FINANCE

Professors Jenkins and Miller; Associate Professors Chuey, Evans, and Magner; Assistant Professors Arnold (chairman), Bensinger, Fortunato, Grim, Lacich, Petrych, Schneider, and Zetts; Instructor Elliott.

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 includes Accounting 605, 606, 701, 702, and a choice of 713 or 813.

A suggested minor in finance consists of 22-23 quarter hours and 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

605. *Elementary Accounting I.* Fundamentals of accumulating 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.

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.

710. *Introduction to Accounting Systems and Data Processing.* This course introduces students to the problems of recording, handling, and processing of information, particularly as it is related to the accounting framework. Students are required to learn a basic computer language (Fortran or Cobol)

and also become familiar with hardware and software aspects of electronic data processing. Prereq.: Junior standing, if non-accounting major. 4 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 are 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. 4 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.

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 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 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 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 and Management 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. Prereq.: 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. *Public Utilities.* Development and importance of the public utility industry. The legal basis for its regulation and control. Public utility financing and problems concerning public utility economics. Prereq.: Economics 603 or 622. 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 intepretation of these financial records. A project involving the application of analytical techniques is a requirement. Prereq.: Accounting 606, Accounting 710 or Computer Science 600, and Finance 730 or Accounting 801. 4 q.h.

ADVERTISING AND PUBLIC RELATIONS

Associate Professors Flad, Lang, and Seibold; Assistant Professors Mamula and Sekeres; Instructors M. Taylor and R. Taylor.

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 629 or 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 creativity 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 advertising agency, and of the stations and networks. The course includes the consideration of such problems as choosing the station, the time and method of broadcast, types of pro-

grams, 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.

BUSINESS EDUCATION

For the major in business education, see the School of Education.

MANAGEMENT

Professors Teodorescu (chairman) and Hovey; Associate Professors Curran, Kohn, Krishnan, and Shuster; Assistant Professors Dastoli, Doll, Long, Moore, Provance, Walsh, and Wolanin; Instructor Daly.

The Department of Management offers courses in various business subjects which (a) complement those of the other departments of the School of Business Administration; (b) provide for the majors in industrial management and transportation management; (c) provide many of the courses for the combined majors in general administration and public administration, and for the major in business education and secretarial studies, and (d) 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; 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, 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 22-23 quarter hours and includes Management 715, 725, and 750 plus 10-11 additional 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 interrelationship 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

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 603 or 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.

712. *Business Letters.* This course is intended to give students an understanding of the human aspects of communication, to help them develop logical patterns of ideas, and to aid them in achieving clear, concise, and relevant expression. Prereq.: Communication 508 or 527. 3 q.h.

713. *Report Writing.* Students are prepared to write reports of the sort required in business and professional activities. Form and structure of various types of reports, procedures and principles of effective communication are treated. Practical problems ranging from simple memorandums to problem-solving reports are assigned. Prereq.: English 508 or 527. 3 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 contractual rights, discharge of contracts, relationship between principal and agent, employer and employee, and their responsibilities 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 715. 4 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.

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 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, regulation 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.

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.

819. *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 704. 4 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 819. 4 q.h.

837. *Management Science.* An understanding 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.: Mathematics 550, Accounting 710 or Computer Science 600, and Economics 704. 4 q.h.

850. *Development of Executive Ability.* Analysis of a series of cases presenting typical and real problems in the area of management as faced by contemporary business concerns. Discussions and reports are used to assist the student in developing his attitude and skill as a leader and decision maker. 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 819. 3 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.

MARKETING

Professor Almond; Associate Professors Burkholder, Hanks, and Roussos; Assistant Professors Davis, Deiderick, Liber, and Mathews.

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 either fashion marketing or industrial marketing or retail marketing. A major in fashion, industrial or retail marketing consists of 45 quarter hours as outlined in the curriculum printed in the Curriculums section. A student majoring in fashion marketing or in industrial marketing or in retail marketing 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, customer 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 624. 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 Motivation.* Timely data generated by current sources of motivational theory and application results, are surveyed and analyzed with the purpose of strengthening the student's ability to recognize and then deal with personal goals. This is done with the aim that personal goals may then be viewed in the light of business objectives as they may be planned, organized, and controlled in the business firm. Special emphasis is placed on the motivational characteristics of marketing executives which permit them to move effectively toward clearly defined goals. Prereq.: Junior standing. 3 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 704. 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.

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 704. 3 q.h.

ADVERTISING ART

For the combined major in advertising art, see Advertising and Public Relations.

FINANCE

For a major in finance, see Accounting and Finance.

GENERAL ADMINISTRATION

For the combined major in general administration, see Management.

INDUSTRIAL MANAGEMENT

For the major in industrial management, see Management.

PUBLIC ADMINISTRATION

For the combined major in public administration, see Management.

TRANSPORTATION MANAGEMENT

For the major in transportation management, see Management.

CURRICULUMS

Required Curriculums for the Degree of Bachelor of Science in Business Administration with the Major as indicated.

The following curriculums all lead to the degree of Bachelor of Science in Business Administration. 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 Mod-

ification for R.O.T.C. students, in the General Requirements and Regulations section.

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 Special Topics of Algebra	5
Math. 550 Introduction to Calculus	5
Mgt. 511 Introduction to Business	3
Psych. 501 Introduction to Psychology	3
Science Elective	4
H&PE 590 Health Education	3
H&PE activity courses	3
	47

SECOND YEAR	Hrs.
Acctg. 701, 702 Intermediate Accounting I, II	10
Acctg. 710 Introduction to Accounting Systems and Data Processing or Computer Science 600 Introduction to Programming	4
Econ. 621, 622 Principles of Economics II, III	6
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
Liberal Arts elective	4
	48

THIRD YEAR	Hrs.
Acctg. 713 Basic Cost Accounting	5
Acctg. 801 Advanced Accounting	5
Econ. 704, 705 Economics and Social Statistics I, II	7
Fin. 720 Business Finance	4
Mgt. 712 Business Letters	3
Mgt. 715, 716 Business Law I, II	8
Mgt. 725 Fundamentals of Management	4
Philosophy and Religious Studies elective or Humanities elective	4
P Rel. 710 Basic Public Relations	3
Electives	6
	49

FOURTH YEAR	Hrs.
Acctg. 807 Auditing	4
Acctg. 813 Federal Tax Theory	4
Accounting elective (Upper Division)	7
Economics elective (Upper Division)	4
Fin. 722 Insurance Fundamentals	3
Mgt. 750 Human Behavior in Organization	4
Mgt. 819 Production Management or Mgt. 850 Development of Executive Ability	4
Mgt. 837 Management Science or Upper Division Elective	4
Elective (Upper Division)	3
Electives	13
	50

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 Special Topics of Algebra	5
Mgt. 511 Introduction to Business	3
Psych. 501 Introduction to Psychology	3
Science electives	8
Social Studies electives	8
HP&E 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
Econ. 621, 622 Principles of Economics II, III	6
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
Liberal Arts Electives	4
	46

THIRD YEAR	Hrs.
Adver. 725 Advertising Copywriting	4
Adver. 727 Advertising Layout	4
Art 623 Advertising Art I	3
Art 780 Photography I or Upper Division elective	4
Econ. 704 Economic and Social Statistics I	4
Mgt. 712 Business Letters	3
Mgt. 715 Business Law I	4
Mgt. 725 Fundamentals of Management	4
P Rel. 710 Basic Public Relations	3
P Rel. 754 Media Presentation in Business	4
P Rel. 756 Business Publications	4
Electives	6
	47

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	4
	45

ADVERTISING ART

The advertising art curriculum requires a total of 194 hours.

FIRST YEAR	Hrs.
Art 510 Color and Design 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 Special Topics of Algebra	5
Mgt. 511 Introduction to Business	3
Psych. 501 Introduction to Psychology	3
Science Elective	4
Social Studies electives	8
H&PE 590 Health Education	3
H&PE activity courses	3
	47

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	6
Mktg. 624 Fundamentals of Marketing	5
Science elective	4
Speech 652 Business and Professional Speech	3
Elective	4
	47

THIRD YEAR	Hrs.
Adver. 725 Advertising Copywriting	4
Adver. 727 Advertising Layout	4
Art 606 Painting I	4
Art 623 Advertising Art I	3
Art 624, 625 Advertising Art II and III	6
Art 705 Advanced Drawing	3
Econ. 704 Economics and Social Statistics I	4
Engl. 600-level literature elective	4
Mgt. 712 Business Letters	3
Mgt. 715 Business Law I	4
Mgt. 725 Fundamentals of Management	4
Philosophy and Religious Studies elective or Humanities elective	4
P Rel. 710 Basic Public Relations	3
	50

FOURTH YEAR	Hrs.
Adver. 823 Advertising Problems and Campaigns	4
Advertising or Public Relations electives	6
Art 727, 728 Advanced Advertising Art	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)	7
Electives	7
	50

FINANCE

The finance 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 Special Topics of Algebra	5
Math. 550 Introduction to Calculus	5
Mgt. 511 Introduction to Business	3
Science Elective	4
Soc. 500 Fundamentals of Sociology	4
H&PE 590 Health Education	3
H&PE activity courses	3
	48

SECOND YEAR	Hrs.
Acctg. 701, 702, Intermediate Accounting I, II or Acctg. 713 Basic Cost Accounting and Acctg. 714 Advanced Cost Accounting	10-8
Econ. 621, 622 Principles of Economics II, III	6
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
Psych. 501 Introduction to Psychology	3
Science Elective	4
Speech 652 Business and Professional Speech	3
Electives	6
	49-47

THIRD YEAR	Hrs.
Acctg. 710 Introduction to Accounting Systems and Data Processing or Computer Science 600 Introduction to Programming	4
Econ. 701 Money and Banking	4
Econ. 704, 705 Economics and Social Statistics I, II	7
Fin. 717 Real Estate Principles	3
Fin. 720 Business Finance	4
Fin. 722 Insurance Fundamentals	3
Fin. 730 Investment Analysis and Management	3
Fin. 731 The Stock Market	3
Mgt. 713 Report Writing	3
Mgt. 715, 716 Business Law I, II	8
Mgt. 725 Fundamentals of Management	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. 833 Public Utilities 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. 819 Production Management or Mgt. 850 Development of Executive Ability	4
Mktg. 815 Marketing Research or Upper Division Elective	4
Electives	11-12
	48-50

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 Special Topics of Algebra	5
Mgt. 511 Introduction to Business	3
Psych. 501 Introduction to Psychology	3
Humanities elective	3
Science electives	8
Social Studies electives	8
H&PE 590 Health Education	3
H&PE activity courses	3
	47

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 Programming	4
Econ. 621, 622 Principles of Economics II, III	6
Engl. 600-level literature elective	4
Mktg. 624 Marketing	5
Mktg. 625 Salesmanship	3
Philosophy and Religious Studies elective or Humanities elective	4
Speech 652 Business and Professional Speech	3
	47

THIRD YEAR	Hrs.
Accounting elective	5
Accounting elective	3-4
Econ. 704 Economics and Social Statistics I	4
Fin. 720 Business Finance	4
Fin. 722 Insurance Fundamentals	3
Mgt. 712 Business Letters or Mgt. 713 Report Writing	3
Mgt. 715, 716 Business Law I, II	8
Mgt. 725 Fundamentals of Management	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
Electives	6
	50-51

FOURTH YEAR	Hrs.
Accounting, Management or Marketing elective	4
Econ. 702 Public Finance or Econ. 802 Comparative Economic Systems	4
Econ. 831 Labor Markets or Econ. 833 Collective Bargaining and Arbitration or Econ. 835 Labor Legislation	4
Fin. 724 Credit Management	3
Fin. 730 Investment Analysis and Management	3
Mgt. 705 Principles of Transportation	4
Mgt. 804 Personnel Management	4
Mgt. 819 Production Management or Mgt. 850 Development of Executive Ability	4
Mgt. 855 Business Ethics	3
Marketing electives (Upper Division)	8
Electives	9-8
	50-49

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 Special Topics of Algebra	5
Math. 550 Introduction to Calculus	5
Mgt. 511 Introduction to Business	3
Psych. 501 Introduction to Psychology	3
Science electives	8
Soc. 500 Fundamentals of Sociology	4
H&PE 590 Health Education	3
H&PE activity courses	3
	45

SECOND YEAR	Hrs.
Acctg. 605, 606 Elementary Accounting I, II	10
Computer Science 600 Introduction to Programming	4
Econ. 621, 622 Principles of Economics II, III	6
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
Electives	9
	49

THIRD YEAR	Hrs.
Acctg. 713 Basic Cost Accounting	5
Acctg. 714 Advanced Cost Accounting or Acctg. 813 Federal Tax Theory	3-4
Econ. 704, 705 Economics and Social Statistics I, II	7
Fin. 720 Business Finance	4
Fin. 722 Insurance Fundamentals	3
Mgt. 705 Principles of Transportation	4
Mgt. 713 Report Writing	3
Mgt. 715, 716 Business Law I, II	8
Mgt. 725 Fundamentals of Management	4
Mgt. 750 Human Behavior in Organization	4
Elective	4-3
	49

FOURTH YEAR	Hrs.
Econ. 831 Labor Markets or Econ. 833 Collective Bargaining and Arbitrations or Econ. 835 Labor Legislation	4
Fin. 730 Investment Analysis and Management	3
Mgt. 804 Personnel Management	4
Mgt. 819 Production Management	4
Mgt. 820 Production Control	4
Mgt. 837 Management Science	4
Mgt. 850 Development of Executive Ability	4
Mgt. 851 Problems in Industrial Management or Mgt. 860 Comparative Management	3-4
Mgt. 855 Business Ethics	3
Mktg. 720 Industrial Marketing	3
Mktg. 815 Marketing Research	4
Mktg. 843 Industrial Buying	4
P Rel. 710 Basic Public Relations	3
Elective	4-3
	51

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 Special Topics of Algebra	5
Mgt. 511 Introduction to Business	3
Psych. 501 Introduction to Psychology	3
Science electives	8
Social Studies elective	4
H&PE 590 Health Education	3
H&PE activity courses	3
	44

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 Programming or Liberal Arts elective	4
Econ. 621, 622 Principles of Economics II, III	6
Engl. 600-level literature elective	4
Mktg. 624 Marketing	5
Mktg. 625 Salesmanship	3
Speech 652 Business and Professional Speech	3
Humanities elective	3
	46

Specialization in Industrial Marketing

THIRD YEAR	Hrs.
Acctg. 713 Basic Cost Accounting	5
Adver. 725 Advertising Copywriting or Upper Division elective	4
Econ. 704 Economics and Social Statistics I	4
Mgt. 712 Business Letters	3
Mgt. 715 Business Law I	4
Mgt. 725 Fundamentals of Management	4
Mgt. 746 Industrial Traffic Management	3
Mktg. 720 Industrial Marketing	3
Mktg. 726 Effective Motivation or Marketing elective	3
Mktg. 750 Industrial Textile Products	5
P Rel. 710 Basic Public Relations	3
Liberal Arts Elective	4
Elective	3
	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
Electives	7
	48

Specialization in Retail Marketing

THIRD YEAR	Hrs.
Adver. 725 Advertising Copywriting	4
Adver. 727 Advertising Layout or Upper Division elective	4
Econ. 704 Economics and Social Statistics I	4
Mgt. 712 Business Letters	3
Mgt. 715 Business Law I	4
Mgt. 725 Fundamentals of Management	4
Mktg. 709 Retail Marketing	3
Mktg. 713 Retail Buying	4
Mktg. 726 Effective Motivation or Marketing elective	3
Mktg. 731 Non-Textiles or Mktg. 733 Furnishings	4
Mktg. 745 Textile Fabrics	5
P Rel. 710 Basic Public Relations	3
Elective	3
	48

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	4
Electives	11
	48

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 Special Topics of Algebra	5
Mgt. 511 Introduction to Business	3
Mktg. 624 Marketing	5
Psych. 501 Introduction to Psychology	3
Science Elective	4
H&PE 590 Health Education	3
	45

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
Computer Science 600 Introduction to Programming or Liberal Arts elective	4
Econ. 621, 622 Principles of Economics II, III	6
Mktg. 625 Salesmanship	3
Speech 652 Business and Professional Speech	3
Science Elective	4
H&PE activity courses	3
	47

THIRD YEAR	Hrs.
Adver. 725 Advertising Copywriting	4
Adver. 727 Advertising Layout	4
Engl. 600-level Literature elective or Humanities elective	4
Mgt. 715 Business Law I	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
Soc. 711 Cultural Anthropology	4
	47

FOURTH YEAR	Hrs.
Adver. 819 Retail Advertising	3
Econ. 704 Economics and Social Statistics I	4
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
Elective (Upper Division)	4
Electives	7
	47

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 Special Topics of Algebra	5
Mgt. 511 Introduction to Business	3
Psych. 501 Introduction to Psychology	3
Science electives	8
Soc. 500 Fundamentals of Sociology	4
Electives	6
H&PE 590 Health Education	3
H&PE activity courses	3
	46

SECOND YEAR	Hrs.
Acctg. 605, 606 Elementary Accounting I, II	10
Econ. 621, 622 Principles of Economics II, III	6
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
Soc. 600 Principles of Sociology or Soc. 711 Cultural Anthropology	4
Speech 652 Business and Professional Speech	3
Electives	8
	48

THIRD YEAR	Hrs.
Acctg. 721 State and Local Taxes	3
Art 709, 710 or 711 History and Appreciation of Art	4
Econ. 702 Public Finance	4
Econ. 704 Economics and Social Statistics I	4
Fin. 720 Business Finance	4
Fin. 730 Investment Analysis and Management	3
Mgt. 712 Business Letters or Mgt. 713 Report Writing	3
Mgt. 715 Business Law I	4
Mgt. 725 Fundamentals of Management	4
P Rel. 710 Basic Public Relations	3
Pol. Sci. 706 Minority Group Politics	3
Pol. Sci. 720 Public Administration	3
Soc. 708 Political Sociology	4
Elective	4
	50

FOURTH YEAR	Hrs.
Acctg. 820 Governmental and Funds Accounting	3
Econ. 803 Business and Government or Econ. 831 Labor Markets	4
Fin. 833 Public Utilities	3
Mgt. 750 Human Behavior in Organization	4
Mgt. 804 Personnel Management	4
Mgt. 850 Development of Executive Ability	4
Mgt. 855 Business Ethics	3
Mgt. 860 Comparative Management or Management elective	4
Management elective	3

Management, Political Science or Sociology electives	3
Pol. Sci. 721 Urban Government	3
Pol. Sci. 722 State and Local Government	3
Elective (Upper Division)	3
Electives	6
	50

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 Special Topics of Algebra	5
Mgt. 511 Introduction to Business	3
Psych. 501 Introduction to Psychology	3
Science electives	8
Soc. 500 Fundamentals of Sociology	4
Humanities elective	3
H&PE 590 Health Education	3
H&PE activity courses	3
	47

SECOND YEAR	Hrs.
Acctg. 605, 606 Elementary Accounting I, II	10
Computer Technology 501 Data Processing Concepts or Computer Science 600 Introduction to Programming	4
Econ. 621, 622 Principles of Economics II, III	6
Engl. 600-level literature elective	4
Mgt. 605 Transportation Rates I	3
Mgt. 606 Transportation Rates II	3
Mktg. 624 Marketing	5
Philosophy and Religious Studies elective or Humanities elective	4
Speech 652 Business and Professional Speech	3
Electives	6
	48

THIRD YEAR	Hrs.
Acctg. 713 Basic Cost Accounting	5
Accounting elective (Upper Division)	3-4
Econ. 704, 705 Economics and Social Statistics I, II	7
Fin. 720 Business Finance	4
Mgt. 705 Principles of Transportation	4
Mgt. 707 Commercial Motor Transportation	5
Mgt. 712 Business Letters or Mgt. 713 Report Writing	3
Mgt. 715 Business Law I	4
Mgt. 725 Fundamentals of Management	4
Mgt. 746 Industrial Traffic Management	3
Mktg. 720 Industrial Marketing	3
Elective	4-3
	49

FOURTH YEAR	Hrs.
Econ. 811 Theory of International Trade or Economics Elective	3
Econ. 831 Labor Markets or Econ. 833 Collective Bargaining and Arbitrations or Econ. 835 Labor Legislation	4
Fin. 722 Insurance Fundamentals	3
Fin. 730 Investment Analysis and Management	3
Fin. 833 Public Utilities	3
Mgt. 740 Office Management and Methods	3
Mgt. 750 Human Behavior in Organization	4
Mgt. 804 Personnel Management	4
Mgt. 808 Water Transportation	3
Mgt. 816 Problems in Transportation	3
Mgt. 855 Business Ethics or elective	3
Mktg. 847 Physical Distribution	3
Marketing elective	4
Electives	7
	50

SECRETARIAL STUDIES

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.

NOTE: See the Technical and Community College 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.

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	6
Engl. 600-level Literature elective	4
Mktg. 624 Fundamentals of Marketing	5
Mktg. 625 Salesmanship	3
Philosophy and Religious Studies elective or Humanities elective	4
Science electives	8
Speech 652 Business and Professional Speech	3
	49

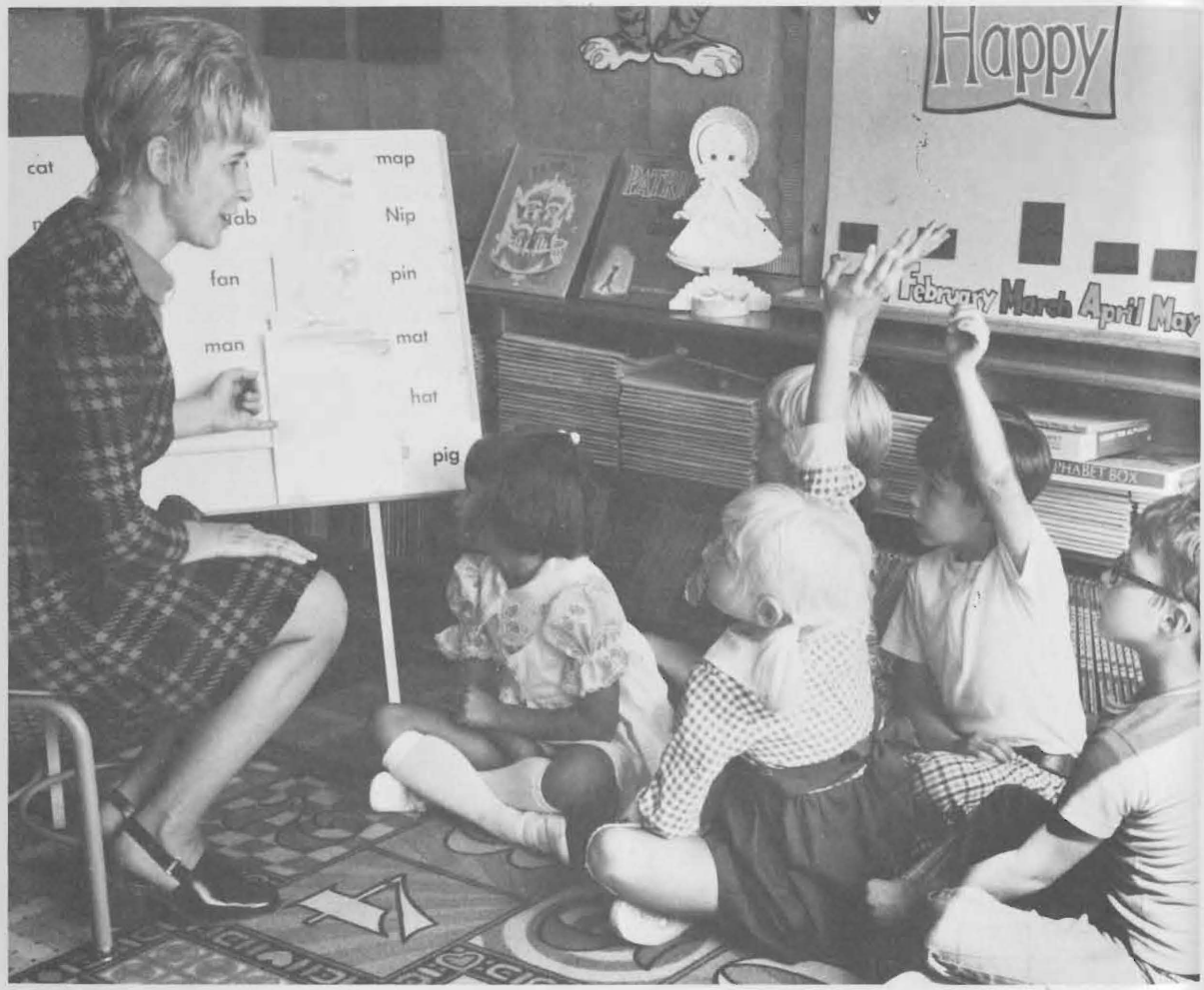
FOURTH YEAR	Hrs.
Acctg. 810 Statement Analysis*	3
Econ. 704 Economic and Social Statistics I	4
Fin. 720 Business Finance	4
Fin. 724 Credit Management	3
Mgt. 725 Fundamentals of Management	4
Mgt. 750 Human Behavior in Organization	4
Mgt. 804 Personnel Management or Management elective 800-level	4

*The student's qualifications for entering these courses will be determined by the chairman of the Department of Accounting and Finance.

Mktg. 709 Retail Marketing or Mktg. 720 Industrial Marketing	3
P Rel. 710 Basic Public Relations	3
Electives (Upper Division)**	10
Electives***	6
	48

**To be used to complete a minor of 21 or more quarter hours in a related field in courses numbered 600 or above.

***3 hours of electives may be used to satisfy the health and physical education activities requirement.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School of Education

Arnold J. Moore, Dean

ORGANIZATION AND DEGREES

The School of Education is concerned with programs preparing individuals for a wide variety of educational positions in schools, colleges, industry, business, welfare, and governmental agencies.

Primary consideration is given to work and curriculums in: 1) preparation of teachers of elementary and secondary schools, 2) preparation of personnel to serve in various levels of school and administrative positions, 3) training of supervisory personnel for curricular development and instructional improvement, 4) programs to prepare persons for the wide variety of guidance and student personnel positions, 5) programs to prepare teachers and other personnel in the area of special education, 6) providing consultative services for the improvement of various aspects of educational programs including in-service training, and 7) providing graduate programs for positions in education at the graduate level.

The School of Education is primarily 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 Technical and Community College, 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's North Central Association of Colleges and Secondary Schools, and the National Council for Accreditation of Teacher Education. The School of Education has the responsibility to serve as the recommending agent for all Youngstown State University graduates who wish to qualify for certification.

Professional courses are offered leading to teacher certification and to a Bachelor of Science in Education degree.

A student has a wide variety of choices for his major which may be in elementary education, special education, media specialist, in one of the many teaching field areas in secondary education, or in the specialized fields of art, health, physical education, or music. Elementary majors may also add kindergarten-preparation and certification; and both elementary and secondary teachers may supplement their programs with courses leading to certification for teaching of the educable mentally retarded.

Prospective teachers may also be certified on the basis of degrees conferred by the College of Arts and Sciences, School of Music, School of Business Administration, and the Technical and Community College, 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. 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 Upper Division status in the School of Education. Such status must be granted before qualifying courses for certification may be taken.

OBJECTIVES OF TEACHER EDUCATION AT YOUNGSTOWN STATE UNIVERSITY

The School of Education promotes the general objectives of Youngstown State University. The University's policy of a broad general education (liberal education) combined with specialized and professional training is promoted through various curriculums of the School of Education.

The faculty of the School of Education, therefore, requires that students obtain a broad general education and plan a program of continuous professional and content study.

REQUIREMENTS FOR CERTIFICATION

All candidates for any form of 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 in accordance with the specific requirements for the degree desired.

1. The candidate for the elementary or kindergarten-elementary certificate usually earns a Bachelor of Science in Education degree. The student may qualify for the Bachelor of Arts degree, but this usually entails a greater number of credit hours.

Initial Certification. The dean of the School of Education is responsible for recommending to the State Board of Education all Youngstown State University graduates who wish to 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.

1. The candidate for the elementary certificate may also be certified in kindergarten-elementary or EMR on completion of the requirements which usually entail a greater number of hours.

2. The candidate for the secondary education certificate must major in a subject matter teaching field. Additional fields (minors) 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, Educational Media, Health Education, Languages, Music and Physical Education.

4. A special education teaching certificate (EMR or LD-BD) may be secured by completing the required number of hours for certification.

5. Teacher certifications are processed by the certification secretary. 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.

6. *Renewal of Certificate.* A provisional certificate may be renewed upon evidence of satisfactory character and teaching ability as evidenced by successful teaching experience within a five-year period immediately preceding the date of application.

A person who has not taught within this period may become eligible for the renewal of the expired certificate by completing 9 quarter hours of refresher training pertinent to the field of teaching.

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. These are normally taken in high school, but if not, they may be made up before the junior year in the University; 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 section.

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 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.

3. The degree 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.

PLEASE BE CONSISTENT WHEN DESIGNATING MAJOR. Majors should be as follows:

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. Special Education—EMR
   (if working toward a major in special education and certification in the field of the educable mentally retarded)

5. Special Education—LD/BD
   (if working toward a major in special education and certification in the field of learning disabilities and/or behavior disorders)

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
   (use the word Special followed by the subject field area. THUS—Special—Art or Special—Health)

NOTE: Since music students enroll in the School of Music rather than the School of Education, this does not apply to them.

Please note that other combinations of designation of major are possible. Example: Special Education — Learning Disabilities and/or Behavior Disorders or Secondary—English—Learning Disabilities and/or Behavior Disorders.

These designations are based on the certification area(s) which the student is seeking.

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. The teaching candidate in the University must exhibit better than average grades in all courses, and a capacity for successful college work as determined by entrance tests. Currently a point average of 2.4 in at least 90 quarter hours of completed college work and satisfactory demonstration of competence in written and spoken English are 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. 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, and must be approved before he enrolls in Upper Division education courses.* Before approval to take Upper Division courses is given, the student is enrolled in his 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 approved 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. Requirements for admission to Upper Division status in the School of Education are the same for transfer students as they are for regular students of Youngstown State University.

The candidate for the provisional high school certificate must complete the requirements for a major in at least one teaching field; he or she 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.

ADVISEMENT

All prospective teachers are advised by the faculty of the school and department in which their major is located; *e.g.:*

1. Elementary education candidates working for the B.S. in Education degree will have a major in education; therefore, they are advised at all times by elementary advisors in the School of Education.

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 com-

‡The student should familiarize himself 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.

*Students in other schools may elect Education 708, 873, 874, or 879 with the permission of the School of Education.

pletely met by existing conventional programs may wish to investigate and apply for the Individualized Curriculum Program (see *General Requirements and Regulations*).

ELEMENTARY EDUCATION

Professors Chrisp and Vanaman; Associate Professors Braden (chairman), Ameduri, Roderick, and Steele; Assistant Professors Fischer, Nichols, Scott, Throop, and Tribble; Instructors Battin and Steines.

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.

Requirements for the Degree

1. The student is required to meet the pre-college or preparatory course requirements normally taken in high school. Any course deficiencies must be made up before the junior year in the University. (See the *General Requirements and Regulations* section for further information).

2. The student is required to complete the general course requirements of the University. These include basic English, health, humanities, social studies and science/mathematics courses required for graduation from the University. (See the *General Requirements and Regulations* 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 student is awarded the Bachelor of Science in Education degree only upon completion of the requirements for a teaching certificate.

Lower Division Courses

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 Division status in the School of Education.)

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 will be required. 3 q.h.

801. *Purposes and Practices of the Ele-*

mentary 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. Applicable to undergraduate and graduate programs. 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. 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.

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. Note: This course should be taken only by students who are not seeking certification in reading. Credit will not be given for both 881 and 856. 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 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. 3 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 his advisor in order to know of these changes.

GENERAL EDUCATION REQUIREMENTS	Hrs.
English 550, 551, 708, 650	
Speech 705	20
English Elective	4
Social Studies:	
History 605-606, 655-656, 661, 662 or 663	12
Geography 502	4
Electives in Social Studies	11
Science: Biology 505	4
Physical Science	4
Elective	4
Math. 515, 516	9
Psychology 601, 755	9
HPE 590, 721, 722	10
HPE Activities (622 required)	3
Humanities: Philosophy 600	4
Elective	3
Music 521, 621, 721	9
Art 760, 767	7

PROFESSIONAL EDUCATION REQUIREMENTS	
Education 501	3
Education 502 (if required)	3
Education 705, 708, 710, 713, 714, 715, 801, 812, 813, 841	44
For K-P certification: Education 830, 831, 832	9
Electives to complete 186 hours required for graduation.	

Possible Concentration Areas For Elementary Education

All students majoring in elementary education must complete the requirements in one of the following concentration areas (minor): (1) English, (2) fine arts, (3) foreign language, (4) language arts, (5) mathematics, (6) media specialist, (7) science and (8) social studies.

1. *ENGLISH.* Forty-five q.h. required, including English 550, 551, 650, 708 and Speech 705. Twenty-one additional hours of English, including at least one Upper Division course, are required.
2. *FINE ARTS.* Thirty-six 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 hours are required and must include Art (Music) 709, 710, 711, 12 q.h. Philosophy 710, Aesthetics, 4 q.h. may be included.
3. *FOREIGN LANGUAGE.* Must total 36 q.h. all in the *same* language. Twenty-four q.h. in one foreign language are required 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 the 24 additional hours, all in the same language.
4. *LANGUAGE ARTS.* Fifty q.h. required including English 550 and 551, 650 and 708; Speech 705; Education 812 and 813. Twenty additional q.h. are required, including Education 814, 881 and 884. A total of nine electives must be selected from the following: Education 825, 882, 894, 896; Art 822; Speech 760; English 709, 710.
5. *MATHEMATICS.* Must total 27 q.h. Eighteen *additional* hours of mathematics are required. Required courses are Math. 617, 618 (5 and 4 or 9 q.h.). Elective courses are Math. 540, 542, 550.
6. *MEDIA SPECIALIST.* Thirty-two q.h. are required, including English 708. Other requirements are English 709 and

710; Education 894, 895, 896, 897, and 898.

7. *SCIENCE.* Must total 36 q.h. Twenty-four additional hours of science are required. Additional mathematics courses beyond Math. 515 and 516 may be substituted for not more than five of these 24 *additional* hours. Students selecting this concentration area may take courses in astronomy, biology, chemistry, geology, geography, and physics.
8. *SOCIAL STUDIES.* Must total 45 q.h. Eighteen additional hours 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.

FOUNDATIONS OF EDUCATION

Associate Professors Baldino (chairman), Kirschner, Leck, and Watkins; Assistant Professors Beckett, Haims, and Pascale; Instructor Heym.

Lower Division Courses

501. *Introduction to Education.* Thorough orientation in state, institutional, and School of Education policies pertaining to graduation and certification requirements, and presentation of a broad background for subsequent courses in education, with wide supplementary reading. Required of all candidates for any form of teaching certificates and/or the education major. This course is a prerequisite for any Upper Division education course 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 the A.C.T. 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, 873, 874, or 879 by permission of the department chairman. All other courses are open only to students who have been admitted to Upper Division status in the School of Education.

708. *The Sociological Foundations of Education.* The school as a social institution. An examination of the various institutions which serve American society, *e.g.:* home, religion, state, economic system, and the interaction of the school with them. Stress will be placed on achieving an understanding of minority cultures, their institutions and their attitude toward the school as an instrument of enculturation. 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.* Each student will be required to participate in an extensive field project designed to give him 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

Associate Professors DiRusso (chairman), DiGiulio, and Schoenhard; Assistant Professors Convery, Little, and Richards.

The department offers work toward 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

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. 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

Associate Professors Hill (chairman), Cobett, Douglass, Feldmiller, McCracken, Philipp, Sample, Schoenhard, and Solak; Assistant Professors Babisch, Beelen, Boggess, Connelly, Feitler, Hwopek, Knauf, Liptak, Longmuir, and Phillips; 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 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.

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, 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 Arts and Sciences.

Art (Major for High School Teaching or Additional Teaching Field). For requirements see Department of Art, College of Arts and Sciences.

Biological Science (Major) Chem. 515, 516, 517 (12 q.h.) required but hours not included for major. Biol. 553, 662, 721, 780, 790 (24 q.h.), *electives (29 q.h.) or Biol. 506, 507, 508, 721, 780, 790 (26 q.h.), *electives (27 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.**

*The elective(s) may be any courses applicable to the major. Suggested are Biol. 661, 701, 762, 770, 771, 775.

**See prerequisites in the catalog.

Chem. 719, 720, 721, Phys. 501, 502, 502L, 503, 503L, Math. 550, 714. Special Methods, Ed. 800G.

Biological Science (Additional Teaching Field) Biol. 553, 662, 721, 780, 790 (24 q.h.), *electives (6 q.h.) or Biol. 506, 507, 508, 721, 780, 790 (26 q.h.), *electives (4 q.h.).

Bookkeeping—Basic Business (Additional Teaching Field or Accounting or General Business Major, School of Business Administration) Acctg. 605, 606, Bus. Ed. and Sec. St. 710, 850, Econ. 520, Mgt. 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) Bus. Ed. and Sec. St. 510, 521, 522, 620, 704, 706, 710, 717, 810, 850, Acctg. 605, 606, Econ. 520, 621, Mktg. 624 (50 q.h.). Any substitutions require permission of Business Education and Secretarial Studies chairman, and/or the chairman of the Department of Secondary Education. Students who plan to teach shorthand must take Bus. Ed. and Sec. St. 630, 631. Students who do not plan to teach shorthand must take 8 additional hours selected from electives. Electives (23 q.h.) from following or approved by department chairman: Bus. Ed. and Sec. St. 621, 622, 730, 731, 718, 720, 805, 820, 840, 851, 860, Acctg. 701, 702, 713, 714, Adver. 631, 632, Econ. 622, 704, Fin. 720, 724, Geog. 519, Mgt. 511, 725, 804, Mktg. 625, Math. 542, Pub. Rel. 710, Speech 614.

Chemistry (Major) Chem. 515, 516, 517, 603, 604, 719, 720, 721, 739, 740, 741, 729 (49 q.h.). Check catalog for mathematics and physics prerequisites. Special Methods, Ed. 800G.

Chemistry (Additional Teaching Field) Chem. 515, 516, 517, 603, 604, 719, 720, 721 (34 q.h.).

Communication Comprehensive (Major only, English or Speech) (Option I) Major in English (43 q.h.), Minor in speech (27 q.h.), journalism (14 q.h.), reading (8 q.h.), Engl. 611, 612, 613 or 614, 755, 756, composition (4 q.h.) from 740, 743, 744, 745, Upper Division electives. Journ. 715, 716 and 6 q.h. from 721L, 722L, 723L. Speech (9 q.h.) in each of the following

*The electives are listed under major, above.

groups: (A) Speech 533, 652, 605, 606 (B) Speech 654, 560, 580, 680, 781, 782, 897, 898, 899 (C) Speech 668, 670, 750, 758, 770, 852, 561, 761, 773, 764, 765, 760, 762. Reading, Ed. 881, 883 (8 q.h.). (Option II) major in speech (41 q.h.), minor in English (29 q.h.), journalism (14 q.h.), reading (8 q.h.). Speech, see *Speech* (High School Teaching Major). English, any three courses from Engl. 610, 611, 612, 613. Engl. 755, 756 (10 q.h.). Composition (4 q.h.) from Engl. 740, 743, 744, 745. Journ. 715, 716, and 6 q.h. from 721L, 722L, 723L. Reading, Ed. 881, 883 (8 q.h.). Special Methods, Ed. 800E.

Data Processing (Additional Teaching Field only). Advisement is in Department of Secondary Education. Mathematics, Comp. Sci. 600, 601 (9 q.h.) or Acctg. 710, 800, Ind. Eng. 827 (11 q.h.) or Ind. Eng. 642, 827 (9 q.h.) or Technical and Community College. Comp. Tech. 500, 502, 601 or 607 (11 q.h.).

Driver Education (Additional Teaching Field only, Department of Secondary Education) Ed. 750, 751 (9 q.h.).

Earth Science (Major*) Astron. 504, 608, Chem. 501 and 502 or 515 and 516, Geog. 502, 625, Geol. 505, 506, 507, 604, 701, 705, 804, or 704, Math. 502, 503, Physics 501, 502 (74 q.h.).

Earth Science (Additional Teaching Field*) Astron. 504, Geog. 625, Geol. 505, 506, 507, 602, 604, 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 (Additional Teaching Field only, Department of Secondary Education), Engl. 708, 709, 710, Ed. 894, 895, 896, 897, 898 (32 q.h.).

English (Major only) Engl. 611, 612, 613 or 614 or two Upper Division courses in each of areas, Survey of English Literature, Survey of American Literature,** Engl. 755, 756, one course in advanced composition from among the following: Engl. 715, 716, 740, 743, 744, 745, Upper Division electives (15 q.h.), Ed. 883. A total of 48 q.h. is required beyond the Basic Composition requirement. A satisfactory term paper must be completed. Special Methods, Ed. 800E.

French (Major only) 45 q.h. in college above the elementary level (*i.e.*, two years in high school French or 501, 502, 503 in college). Requirements: 601 (unless has had three years in high school), 602 (unless has had four years in high school), 615 (unless waived), 705, 706, 675 (unless waived), 771, 772, 655 and electives in 800-level courses and/or 755, 756. Phonetics 872 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, Phys. 501, 502 (32 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, 604, 625, 805, Geol. 701; (Group B) Geog. 626, 722, 723, 725, 808; (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 of 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 in high school German or 501, 502, 503 in college). Requirements: 601 (unless has had three years in high school), 602 (unless has had four years in high school), 615, 618, 620, 705, 706, 740, 712, and electives in 800-level courses and/or 765, 766. Special Methods, 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.

*Astronomy and geology courses satisfy the science requirement for either A.B. or B.S. degree.

**See Department of English for listing of courses in this area.

Health Education (Additional Teaching Field, High School only) Biol. 551, 552, H&PE 601, 690, 700, 790, 791, 890, 891, at least one elective from the following: Home Econ. 551, Biol. 721, Chem. 501, Psych. 707, 708, Soc. 705 (34-35 q.h.).

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, 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, 550, 551, 551L, 601, 604, 652, 701, 705, 706, 707, 762, 763, 770, 800, 850, 852 (58 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 in high school Italian or 501, 502, 503 in college). Requirements: 601 (unless has had three years in high school), 602 (unless has had four years in high school), 705, 706, 730, 731, 750, 751, History of Italian Language, offered under Ital. 885, and electives in 800-level courses. Special Methods, 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. Requirements: Latin 601, 602, 701, 702, 703, 804, 809. Electives 12 q.h. in 800-level Latin courses and 7 q.h. in other courses acceptable in relevance and level to the department chairman. The inclusion of ancient Greek is recommended. Special Methods, Ed. 800L.

Latin (Additional Teaching Field) 30 q.h. in college above the elementary level. Requirements: Latin 601, 602, 701, 702, 703, 804, 809. Electives, 4 q.h. in other courses acceptable in relevance and level to the department chairman.

Mathematics (Major) Math. 571, 572, 673, 674, 727, 740, 871, 890 (32 q.h.), electives from 700- and 800-level courses (16 q.h.). Special Methods should be Ed. 800M or 800G. Math. 890 is not required if Ed. 800M is taken. The total is then 46 q.h.

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.

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 (Aditional 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. 812, 881, 882, 883, 884 (18 q.h.).

Russian (Major only) 45 q.h. in college above the elementary level (*i.e.*, two years in high school Russian or 501, 502, 503 in college). Requirements: 601 (unless has had three years in high school), 602 (unless has had four years in high school), 615 or 763, 715, 716, 604, 765, 770, 808, 809. Electives, 885 with selected topics and/or by taking courses in other areas related to Russian as Hist. 777, 778, 779, 780, 781, Geog. 719, Pol. Sci. 783, 762, 741, Philos. 618, 808, Econ. 807. The latter are recommended for those who intend to continue in graduate work in Russian area studies or enter government jobs.

Salesmanship-Communication (Advertising and Public Relations or Marketing Major, School of Business Administration or Additional Teaching Field) Bus. Ed. and Sec. St. 521, 710, 850, Mgt. 712, 713, Mktg. 624, 625, Spech 614 (25 q.h.), electives, 4 q.h., in marketing and 5 q.h. to be approved by advisor.

Science Comprehensive (Major only, advisement in Department of Secondary Education) Astron. 504, 608 (7 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, 507, 602, 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 (42 q.h.), elective (3 q.h.).

Social Psychology (Additional Teaching Field*) Psych. 601, 615, 700, 701 or 800, 709, 708, 756, 802, 845 (33-34 q.h.).

Social Studies Comprehensive (Major only, Department of Political Science) 90 q.h. including the core requirements* of Soc. Sci. 501, 502, 503 (9 q.h.). Hist. 605, 606 (8 q.h.). The student should note that the University requirements for the social studies major are in addition to the core and history courses above. Complete major requirements are stated in the catalog under Social Studies. Ohio permits the graduate with a social studies comprehensive major to teach history (30 q.h.) and any of the other five fields in which he has completed 18 q.h. The five departments included in this major have made the folowing recommendations for concentration fields: (Economics)* Soc. Sci. 502 (3 q.h.), Econ. 520, 621-622 (9 q.h.), electives Upper Division (6 q.h.), (Geography) Geog. 502, 519 (8 q.h.), electives (10 q.h.), (History) Hist. 605*, 606*, 655, 656 (16 q.h.), plus 14 q.h. of electives, Upper Division (8 q.h.), (Political Science);* Soc. Sci. 503 (3 q.h.), Pol. Sci. 601, 640 or 660, 704, 722 (14 q.h.), (Sociology)* Soc. Sci. 501 (3 q.h.), Soc. 600, 700, 707 (15 q.h.), (Anthropology) Soc. 602, 711, 712, 714, 715 (18 q.h.). Special Methods, Ed. 800S.

Sociology (Major) Soc. 600, 701, 751, 760 (19 q.h.) plus 26 additional q.h. selected for 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 (33 q.h.).

Spanish (Major only) 45 q.h. in college above the elementary level (*i.e.*, two years in high school Spanish or 501, 502, 503 in college). Requirements: 601 (unless has had three years in high school), 602 (unless has had four years in high school), 615 (unless waived), 705, 706, 717, 725, 726, 655 or 750 or 751, and electives in 800-level courses and/or 729. Special Methods, Ed. 800L.

Speech (High School Teaching Major)

*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.

Speech 553 or 652, 560 or 580, 605, 606, 654, 668, 670, 680 or 781 or 782, 750 or 758 or 770 or 852, 561, 761 or 763 or 764 or 765 or 760, 762, 897 or 898 or 899 (47 q.h.). Students intending to do work in high school forensics should contact Speech and Dramatics Department advisors. Students interested in high school dramatics should take as many of the theatre courses as possible, especially Advanced Acting and Play Directing, Special Methods course, Ed. 800G.

Stenography-Typing (Additional Teaching Field only) Bus. Ed. and Sec. St. 521, 522, 620, 810, 630, 631, 730, 704, 510 or 805, 850, 830 (33 q.h.).

Typewriting (Additional Teaching Field only) Bus. Ed. and Sec. St. 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 843 (35 q.h. including 710 but not 502), Psych. 501 or 601, 709 (7-9 q.h.), Engl. 550, 551 (8 q.h.), Speech 553 (3 q.h.), humanities*[4] (8-18 q.h.), science and mathematics*[5] (12-22 q.h.), social studies*[6] (16-22 q.h.), H&PE 590 and three one-quarter-hour activity courses (6 q.h.)*[7].

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.* See *Student Teaching.*

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

*[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]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 and Dramatics, 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.

*[5]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.

*[6]Social Studies (Departments of Economics, Geography, History, Political Science, Psychology, Sociology/Anthropology) are to be taken in a maximum 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.

*[7]A combined total of 46 q.h. must be taken in humanities, science and mathematics, and social studies.

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 winter and summer quarters. Education 800E for English will be offered fall, winter, and spring quarters. Education 800L for foreign languages will be offered in the fall quarter. Education 800M for mathematics will be offered in the fall 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.

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.

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 897. 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 Hoops (chairman), Dunsing, and Smith.

Upper Division Courses

(Open only to students who have been admitted to Upper Division status in the School of Education.)

Special Education Programs

Undergraduate students in special education may elect one of two Ohio Department of Education certification programs: Educable Mentally Retarded (EMR) or Learning Disabilities/Behavior Disorder. (LD/BD).

Educable Mentally Retarded Programs have been provided in many public, private and parochial schools for individuals who have been identified as needing special education programming for the Educable Mentally Retarded (formerly Ohio Slow Learner). A student preparing to meet this certification sequence will generally be working as a classroom teacher, a consultant in EMR programs, an EMR learning center teacher, or as a teacher in any one of several other Ohio Special Education alternate classroom model programs. Many persons planning to work with the Trainable Mentally Retarded (TMR) programs sponsored by the Ohio Department of Mental Hygiene and Developmental Disabilities also complete this certification pattern.

Learning Disabilities/Behavior Disorders Individuals who have been identified as needing LD/BD programming are generally considered to be of average intellectual level, but need special intervention in their educational programming due to specific learning problems. Students who complete this program may function as classroom teachers, LD/BD consulting teachers, learning center teachers, or learning disability tutors.

732. *Education of Exceptional Children.* Prereq.: Admission to the School of Education. Required for special education programs in educable mentally retarded (slow learners), and behavior disorders/learning disability. 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. Prereq.: Successful teaching experience or Education 732, and at least nine hours of elementary methods. 4 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 or equivalent; Education 714 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 833 or 863 or equivalent; Education 812 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 or equivalent; Education 713 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 732 and 833 or 863 or equivalent. 3 q.h.

854L. See description of Education 854. Prereq.: Education 732 and 833 or 863 or equivalent. 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 732 and Education 833. 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 behavior; identification of patterns of possible neurological disability and emotional disturbance; techniques in meeting the needs of learning disabled and behavior disordered individuals. Prereq.: Education 732. 3 q.h.

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.: Education 732 and 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 732. 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 732 and Education 833. 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. Prereq.: Education 732, 833 or 863, or the equivalent. May be repeated if content is different. 1-6 q.h.

867. *Practicum in Learning Disabilities/Behavior Disorder.* 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 861, 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 732, 833 or 863, or equivalent. May be repeated to maximum of accumulative total of 6 q.h. 1-6 q.h.

Students preparing to work with the Educable Mentally Retarded and/or the Learning Disability/Behavior Disorder programs must complete all of the General Education requirements and the specific education courses as prerequisites, as well as the certification courses in the Special Education program of their choice. Many students choose to combine the Educable Mentally Retarded certificate with either the Elementary Education, EMR (El Ed) or the Secondary Education, EMR (Sec. Ed-Major). Students electing the Learning Disabilities/Behavior Disorder certificate must combine the LD/BD certificate with one of the standard certificate programs, viz., LD/BD (El Ed) or LD/BD (Sec. Ed-Major).

Bachelor's degree—Four-year Program
Certification in Educable Mentally Retarded and Elementary Education

GENERAL EDUCATION REQUIREMENTS

Courses	Cr.	Courses	Cr.
Engl. 550	4	Geog. 502	4
Engl. 551	4	Hist. 605 or 606	4
Engl. 650	5	Hist. 655 or 656	4
Engl. 708	4	Hist. 661 or 662	4
Engl. Lit.	4	11 hrs. of the following	
Speech 705	3	Soc. Sci. 501, 502	3
Psych. 601	5	Soc. Sci. 503	3
Psych. 755	4	Econ. 500	3
Music 521	3	Pol. Sci. 600, 601	4

Music 621	3
Music 721	3
Art 760	4
Art 767	3
HPE 590	3
HPE 722	3
HPE 721	4
HPE Activity	1
HPE Activity	1
HPE Activity	1
Math 515	5
Math 516	4
Soc. 600 (S.S. p501) or 500	4-5
Soc. 602 (S.S. p501)..	4
Biol. 505	4
8 hrs. of the following	
Chem. 501	4
Astr. 504 (Biol. & Phy. Sci. required)	4
Geol. 505	4
Phys. 500	4
Biol. 506	4
Biol. 507	4
(Humanities)	3-4
Ed. 501	3
Ed. 502	3

UPPER DIVISION EDUCATION COURSES

Courses	Hr.	Courses	Hr.
Ed. 732-Exch. Ch.	4	Ed. 705-Prof. Lab.	3
Ed. 833-Tch. EMR*	4	Ed. 708-Soc. Found.	4
Ed. 851-Soc. St.-EMR	3	Ed. 710-Meas. & Guid.	4
Ed. 852-Lang.-EC	3	Ed. 713-El. Arith.	3
Ed. 853-Math.-EC	3	Ed. 714-El. Soc. St.	3
Ed. 855-Occ. Tng.	3	Ed. 715-El. Sci.	3
Ed. 861-Beh. Dis.	3	Ed. 801-P&P	3
Ed. 864-T/P Con.	3	Ed. 812-El. Lang. I	3
Ed. 843-St. T-EMR		Ed. 813-El. Lang. II	3
		Ed. 843-St. T-El. Ed.	

*Prereq. to this cert.

SUPPORT AREA: (21 hours) Students elect a minor in any of the following areas or submit one for consideration: physical education, psychology, sociology/anthropology, art, music, early childhood, educational media, reading.

Bachelor's Degree—Four-year Program
Certification in Learning Disabilities/Behavior Disorder and Elementary Education

GENERAL EDUCATION REQUIREMENTS

Courses	Cr.	Courses	Cr.
Engl. 550	4	Geog. 502	4
Engl. 551	4	Hist. 605 or 606	4
Engl. 650	5	Hist. 655 or 656	4
Engl. 708	4	Hist. 661 or 662	4
Engl. Lit.	4	11 hrs. of the following	
Speech 705	3	Soc. Sci. 501, 502	3
Psych. 601	5	Soc. Sci. 503	3
Psych. 755	4	Econ. 500	3
Music 521	3	Pol. Sci. 600, 601	4
Music 621	3	Soc. 600 (S.S. p501) or 500	4-5
Music 721	3	Soc. 602 (S.S. p501)..	4
Art 760	4	Biol. 505	4
Art 767	3	8 hrs. of the following	
HPE 590	3	Chem. 501	4
HPE 722	3	Astr. 504 (Bio. & Phy. Sci. required)	4
HPE 721	4	Geol. 505	4
HPE Activity	1	Phys. 500	4
HPE Activity	1	Biol. 506	4
HPE Activity	1	Biol. 507	4
Math. 515	5		
Math. 516	4	(Humanities)	3-4
		Ed. 501	3
		Ed. 502	3

UPPER DIVISION EDUCATION COURSES

Courses	Hr.	Courses	Hr.
Ed. 732-Exch. Ch.	4	Ed. 705-Prof. Lab.	3
Ed. 863-LD Child.*	3	Ed. 708-Soc. Found.	4
Ed. 852-Lang.-EC (p812) sp.	3	Ed. 710-Meas. & Guid.	4
Ed. 853-Math.-EC (p713)w	3	Ed. 713-El. Arith.	3
Ed. 862-LD Clin.	3	Ed. 714-El. Soc. St.	3
Ed. 861-Beh. Dis.	3	Ed. 715-El. Sci.	3
Ed. 864-T/P Con.	3	Ed. 801-P&P	3
Ed. 867-Prac. L/D	3	Ed. 812-El. Lang. I	3
Ed. 881 Corr. Rdg.	3	Ed. 813-El. Lang. II	3
Ed. .....-St. T-LD/BD		Ed. .....-St. T-El. Ed.	

*Prereq. to this cert.

SUPPORT AREA: (21 hours) Students elect a minor in any of the following areas or submit one for consideration: physical education, psychology, sociology/anthropology, art, music, early childhood, educational media, reading.

STUDENT TEACHING

Associate Professor Hammack (director).

(Open only to students who have been admitted to Upper Division status in the School of Education.)

The student teaching experience in the sequence of professional courses leading to provisional (standard) certification is differentiated into two in-school experience courses totalling 18 quarter hours.

The Professional Lab portion (three quarter hours) of this experience normally occurs in the student's junior year and the student teaching practicum (15 quarter hours) is to be experienced in the student's senior year.

704. *Professional Laboratory Experience: High School and Special Certificate* and

705. *Professional Laboratory Experience: Elementary and Special Education.* Observational and participatory experiences under the direction of regular teachers and administrative personnel. The purpose of either course is to provide the student with a comprehensive experience of the total school operation. The goal of this course is to enable the student to enter student teaching with (a) an understanding of the teacher's function in the total organization and program of services for the students in the high school/elementary school and (b) a satis-

factory level of personal confidence for the task of teaching in an organized and functioning classroom. The student may tutor pupils as a major in-school activity. Other in-school activities and experiences may include observation of all age-grade and ability levels, observation of the non-teaching functions in the building, assisting with instructional materials, assisting with some classroom and homeroom routine, and assisting with preparation of some classroom materials. The student will be scheduled by and under the immediate supervision of the building principal or his designee. The minimum time is to be six hours weekly in a school, but the full school time involved in one full day must be met (or two half-days as a minimum acceptable time block per day even if it exceeds six hours). In addition, a seminar is required weekly. This course should be scheduled during the first quarter following admission to Upper Division status (after 90 quarter hours earned) and, if the course is 704, must precede or be scheduled concurrently with Education 706. Required before student teaching of all students in a course sequence leading to certification unless equivalent experience can be established. Prereq.: Admission to Upper Division status in the School of Education, or consent of the dean of the School of Education (or designee). 3 q.h.

The practicum portions of the student teaching courses (15 q.h.), Education 841, 842, 843 or 860, have the following in common:

Actual classroom teaching under the direction of experienced cooperating teachers and campus supervisors. The course is to be scheduled during one of the senior year quarters, except that student teaching is not offered during the summer quarter.

Application to take student teaching should be filed by March 1st of the year preceding the academic year (either fall, winter, or spring quarter) in which student teaching is to be completed. In addition to the application the student must register for student teaching (Ed. 841, 842, 843, or 860) during the open registration period preceding the quarter in which student teaching is to be experienced.

A student teaching experience of high quality is the most important factor in the assignment of student teachers. Assignments are made on the basis of many factors. The key factor is the availability of a cooperating teacher who satisfies the Youngstown State University "Criteria to Identify Cooperating Teachers . . ." as established by the educational community cooperating with student teachers through their Advisory Committee on Student Teaching.

The purpose for student teaching is to provide opportunity for the student teacher to apply techniques and methods learned in prerequisite courses to actual classroom teaching situations with responsibility to pupils on an increasing load assignment as the quarter progresses.

The goal of student teaching is to develop behavior patterns and skills necessary to function as a teacher on initial professional employment.

Quality and Nature of Work and Schedule. All classroom teaching and participatory experiences must be satisfactory at all times or the work may be discontinued without warning. Weekly seminars are required and attendance is mandatory. (Students failing to attend the first regularly scheduled seminar by choice will be dropped.) Additional individual conferences with the campus supervisor, the seminar instructor, or with the regular classroom teacher may follow the supervisory visits. The Student Teaching Program requires the presence of the student teacher in the classroom for the whole day during each school day of the entire quarter, and, therefore, additional courses should not be scheduled without approval of the Director of Student Teaching.

841. *Supervised Student Teaching: Elementary.* Required of all elementary candidates. Prereq.: Completion of the major methods courses (specifically, Education 713 and Education 812, 813), senior status, and the approval of the chairperson (or designee) of the Elementary Education Department. 15 q.h.

842. *Supervised Student Teaching: High School.* Required of all candidates for high school certificates. Prereq.: Senior status and completion of Education 706 and Education 800 or the equivalent methods course in the special fields concerned, *i.e.,* health and physical education, art, music, or home economics (waiver of the Education 800 prerequisite normally will not be allowed except to postgraduate students who are willing to take Education 800 concurrently),

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 requirement below *C;* and the approval of the chairperson (or designee) of the department of the student's major. 15 q.h.

843. *Supervised Student Teaching: Special Field or Special Education.* Required of all candidates for Special Certification in Art, Health Education, Physical Education, and Music which apply to grades K-12; and for Special Education (EMR or LD/BD) if the certificate candidate also is to earn a provisional elementary or a provisional high school certificate as a second certificate.

Assignments for Special Certificate candidates will be half-time in both elementary and secondary schools or full-time in a middle school or junior high school. The student teaching day is the full school day in the assigned school.

Assignments of candidates for special education certificates (*e.g.*, EMR or LD/BD) and elementary or secondary teaching certificates will be partly in each certificate area.

Prereq.: Senior status; completion of Education 706 and the appropriate special methods courses (i.e., H.E. 700, 792, 890 for health education candidates; P.E. 750 (men), 760, 765, 780, 785 (women), 890 for physical education candidates; Home Ec. 800 for home economics candidates; Music 823, 824, 825 for music candidates; Art 724 and 760 for art candidates; Education 732, 833, 851, 852, 853 for EMR candidates; Education 861, 862, 863, 865 for LD/BD candidates). The student must meet the prerequisites in each field for which certificates are to be earned. The approval of the chairperson (or designee) in the departments in which certificates are to apply must be obtained. 15 q.h.

860. *Supervised Student Teaching: Educable Mentally Retarded (EMR) and Learning Disabilities/Behavioral Disabilities (LD/BD).* Required of all candidates for special education certificates except, if the candidate is also a candidate for an elementary or secondary certificate, then student teaching will be elected as Education 843 (Special Field or Special Education).

Prereq.: Senior status; completion of Education 732, 833, 851, 852 and 853 if EMR or Education 861, 862, 863, 865 for LD/BD; and the recommendation and unqualified approval by the chairperson (or designee) of the Special Education Department. 15 q.h.

Students desiring to qualify for both elementary and secondary certification should follow the sequence required for either an elementary or secondary certificate. These students should include in their free electives as many courses required for the "retraining certificate" as their degree program will permit. The balance of the "retraining certificate" courses may be taken as a postgraduate to qualify for the additional certificate. The respective department heads (elementary or secondary education) will advise on the "retraining certificate" courses.

The William Rayen School of Engineering

Michael Jean Charignon, Dean

ORGANIZATION AND DEGREES

OBJECTIVES

The aim of the William Rayen School of Engineering is to complete the general objectives of the University by providing a rigorous discipline in engineering based on a sound understanding of the fundamental sciences and arts upon which all engineering rests.

Each curriculum therefore combines three interrelated programs; in basic science, in an engineering field, and in liberal arts. The basic science program, consisting of mathematics and the physical sciences, provides the basis for the engineering program and increases the student's knowledge of the physical world around him. The engineering program teaches the art of applying science to the practical problems of society which may be delineated as engineering, both locally and nationally.

The student may major in chemical, civil, electrical, industrial, materials science, or mechanical engineering. Curriculums for these major fields are given at the end of this section.

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 8 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 thermometer, 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 he satisfies all the graduation requirements for the degree he seeks. For the Bachelor of Engineering degree, these consist of:

1. The pre-college or preparatory courses. These are normally taken in high school, but any deficiencies may be made up before the junior year in the University. They 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 this degree require a minimum of 198 quarter hours

of credit. The program can be completed in four academic years by those who are capable of successfully completing the study loads outlined. The program can be accelerated for completion in three-and-a-half calendar years by the student willing and able to carry heavier loads.* A student planning to take summer courses should consult his advisor.†

R.O.T.C. students may meet the health education and physical education *activity* course requirement by completing Military Science 501-502-503 and 601-602-603, but no other courses are waived for such students who are working toward the B.E.

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).

*This plan is not encouraged if the student intends to hold a strenuous or time-consuming outside job regularly while enrolled in classes.

†It is recommended that such courses be the non-science courses, such as Social Science 501, 502, 503 and Management 715, 716.

PRE-COLLEGE

SUBJECT	High School Units
English	3
United States history and civics	1
Algebra	2
Geometry	1
Physics	1
Others‡	8

‡A unit of mechanical drawing and a half-unit of trigonometry or solid geometry, or both, are strongly advised.

IN THE UNIVERSITY

REQUIREMENTS IN ADDITION TO COURSES

Successful completion of at least 198 quarter hours in addition to the completion of any specified preparatory course not completed at time of entrance.
Major and minor requirements (see general requirements for majors and minors).
Course-level requirements.
Residence requirements.
Application for graduation.

MINIMUM COURSE REQUIREMENTS	Quarter Hours
Basic Composition	8
Health and Physical Education 590 Health Education	3
Health and physical education activity courses	3
Basic sciences	24
Mathematics beyond trigonometry	22
ENGINEERING MAJOR	45
Design Synthesis and Systems	22
Free elective (mathematics, science or engineering)	4
General engineering, other	43
UNIVERSITY GENERAL COURSE REQUIREMENTS	
Social studies	16
Humanities	8

COURSES OF INSTRUCTION AND CURRICULUMS†

CHEMICAL ENGINEERING AND MATERIALS SCIENCE

Professors Slawecki (chairman), Ahmed, and Krill; Associate Professors Jones, Sheng, and Stevens; Assistant Professors Devletian and Szirmay.

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 nonflow 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.

†The student should familiarize himself 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.

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.

686R. *Industrial Pollution Control.* Introduction to modern methods for waste control in chemical operations including filtration, ejector aeration, deep well disposal, activated sludge treatment and disposal, instrumental analytical control methods, and current approach to waste control education and program formulation. Prereq.: Math. 673, Chem. 517, or ChE 681R. 3 q.h.

687. *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, ChE 681R or Chem. 517. 3 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.

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. Relationship

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 crystallization, 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.

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.

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. Simulation of control systems with the aid of an analog computer. Prereq.: ChE 881 and Math. 705. 4 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 781 and 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 687. 4 q.h.

Materials Science

581. *Introduction to Materials Science and Engineering.* Introductory course for freshman students 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. Electron 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.* Discussions 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.

630, 631, 632. *Principles of Extractive Metallurgy I, II, III.* Fundamentals of extractive metallurgy and metallurgical processes, general classification of ores and principles of ore dressing, treatment of concentrates, hydrometallurgical and pyrometallurgical processes, fluxes and slags, production of metal, refining of crude metal, ferrous production metallurgy, concentration of ores, charge calculation, blast furnace—its operations, chemistry of the process, open hearth processes, electric smelting of ores, casting of ingots, non-ferrous production metallurgy, mineral beneficiation smelting refining, and casting of non-ferrous metals. Prereq.: Chem. 515. 3+3+3 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 632. 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 632. 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, 632. 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, 632. 3 q.h.

782. *Phase Diagrams.* Discussions and interpretation of phase diagrams of multicomponent system. Prereq.: MAT SCI 615, 632. 3 q.h.

783. *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 632. 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, 631, 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 concurrent. 1 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.: MAT SCI 793R. 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.: MAT SCI 793R. 3 q.h.

852, 853, 854. *Advanced Engineering Materials (Non-Metallic) I, II, III.* Discussions on ceramic materials, composites and ceramets 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 prop-

erties; 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 parameter. (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 780. 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 metal. 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

CIVIL ENGINEERING

Professor Cernica (chairman); Associate Professors Bellini and Householder; Assistant Professors Bakos and Ritter.

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 Civil Engineering.* An introduction to the field of civil engineering and its role as a profession. Discussion of the history, branches, and future of civil engineering, including organizations and employment fields and opportunities. Demonstrations of the various laboratory techniques and equipment utilized by the various civil engineering branches. Field trips and presentations by practicing engineers to supplement both discussion and demonstrations. 1 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. 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. 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. 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; prereq. 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, spirals, and vertical curves. Course includes a laboratory to acquaint the student with field surveying principles and techniques. Prereq.: Math. 571, ME 503. 5 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. Course includes a laboratory to illustrate the field and office techniques used in route location, mapping, and layout. Prereq.: CE 710. 4 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. 4 q.h.

717. *Hydraulic 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. 4 q.h.

748. *Structural Engineering.* This course is intended to: 1) provide an opportunity for 2-year technology graduates to continue their education via a 4-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 2-year technology programs to our 4-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 dept. chairman. Prereq. 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. 5 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. 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. 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 749. 4 q.h.

833. *Fluid Mechanics & Hydraulic Engineering.* This course is intended to: 1) provide an opportunity for 2-year technology graduates to continue their education via a 4-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 2-year technology programs to our 4-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 dept. chairman; prereq. 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. 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. 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. 4 q.h.

853. *Design I.* An introduction to the design of reinforced concrete and structural steel. Included are the design of beams, columns, footings, and connections. Prereq.: CE 749. 4 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. 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. 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. The laboratory includes typical procedures and physical testing of soil samples. Prereq.: Math 674; CE 749. 4 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. 4 q.h.

ELECTRICAL ENGINEERING

Professor Siman; Associate Professors Kramer (chairman) and Alexander; Assistant Professors Foulkes, Rost, and Skarote.

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 Electrical Engineering.* A course designed to introduce freshmen to the various aspects of electrical engineering as a profession. Discussions, lectures and laboratory demonstrations centered on topics of pertinent interest. 1 q.h.

700, 701R, 702R. *Circuit Analysis I, II, III.* Kirchhoff's Laws, interconnection diagrams, topology, linear algebraic equations, matrix algebra of networks, cut sets, 2-port parameters, tree and loop models. Laplace transform, matrix solution of simultaneous differential equations and state solution, inductive 2-ports. Fourier techniques. Each class consists of 3 hrs. of class and 3 hrs. of laboratory. Prereq.: EE 714R or EE 715R. 4+4+4 q.h.

703R. *Control Analysis I.* Continuous-time systems, discrete-time systems, state variables, classical and state variable compensation. 3 hrs. lecture and 3 hrs. laboratory. Prereq.: EE 702R. 4 q.h.

704R. *Field Theory I.* The application of vector relations, static electric fields, dielectric materials, boundary conditions, field mapping, steady electric currents, and their magnetic fields, and the motion of charged particles to electrical problems. Three hours lecture and three hours laboratory. Prereq.: Math. 705. 4 q.h.

705R. *Field Theory II.* The application of ferromagnetics, time changing electric and magnetic fields, Maxwell's equation, relations between field and circuit theory, plane waves, poynting vector energy relations, and boundary conditions to electrical problems. Three hours lecture and three hours laboratory. Prereq.: EE 704R. 4 q.h.

706R. *Transmission and Propagation.* The application of transmission theory, infinite line, terminated line, impedance transformation, waveguide, simple antenna systems, group and phase velocity, impedance of waveguide to electrical problems. Three hours lecture and three hours laboratory. Prereq.: EE 705R. 4 q.h.

707R. *Physical Electronics.* Physical theory of electron devices, terminal characteristics; large and small signal analysis of electron devices and circuit components; applications to rectification and to amplification; equivalent circuits. 3 hrs. lecture and 3 hrs. laboratory. Prereq.: EE 700. Concurrent: EE 704R. 4 q.h.

708R. *Electronic Circuit Theory II.* Transistor amplifier models, feedback analysis, stability, frequency characteristics, transient and steady state analysis of electronic devices and circuits. Coupled amplifiers. 3 hrs. lecture and 3 hrs. laboratory. Prereq.: EE 707R. 4 q.h.

709R. *Communications Systems I.* Signal analysis. Power density spectra. Communications systems; amplitude modulation, angle modulation, pulse modulation systems. Introduction to information transmission. 3 hrs. lecture and 3 hrs. laboratory. Prereq.: EE 708R. 4 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. 673. 4 q.h.

715R. *Electrical Devices.* Introduction to the basic principles of analysis of electromechanical devices, study of automatic feedback control, instrumentation, and ana-

log computers. Prereq.: EE 714R or permission of Electrical Engineering chairman. 4 q.h.

716. *Circuits and System Logic.* Analysis of circuits and signals associated with switching circuits, switching logic, and the fundamentals of combinational circuits. Intended (1) as a transition course, to serve as an alternate opportunity for any student completing any two-year electrical technology program who may desire to complete his baccalaureate program in electrical engineering, (2) to serve as a refresher course for students who need up-dating in order to continue their electrical engineering baccalaureate studies, and (3) to serve as an up-dating and refresher course for engineers in industry. Permission of department chairman. Prereq. or concurrent: Math. 572. 4 q.h.

717. *Physical Electronics, Circuits and Systems.* A comprehensive treatment of integrated electronics, analog, and digital circuits and systems. Intended (1) as a transition course, to serve as an alternate opportunity for any student completing any two-year electrical technology program who may desire to complete his baccalaureate program in electrical engineering, (2) to serve as a refresher course for students who need updating in order to continue their electrical engineering baccalaureate studies, and (3) to serve as an up-dating and refresher course for engineers in industry. Permission of department chairman. Prereq. or concurrent: Math. 673. 4 q.h.

718. *Energy Conversion Analysis.* A comprehensive analysis of energy conversion, devices, circuits and systems. Intended (1) as a transition course, to serve as an alternate opportunity for any student completing any two-year electrical technology program who may desire to complete his baccalaureate program in electrical engineering, (2) to serve as a refresher course for students who need up-dating in order to continue their electrical engineering baccalaureate studies, and (3) to serve as an up-dating and refresher course for engineers in industry. Permission of department chairman. Prereq. or concurrent: Math. 674. 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. 3 hrs. lecture and 3 hrs. laboratory. Prereq.: EE 706R, 708R. 4 q.h.

807R. *Pulse, Digital, and Switching Circuits.* The generation and processing of non-sinusoidal waveforms in active and passive devices and circuits. (Pulse, digital, and switching waveforms). Prereq.: EE 708R, 702R. 4 q.h.

808R. *Electronic Circuits Signals and Systems.* A continuation of Electrical Engineering 709R with emphasis on problems arising from communications and electronics areas. Correlation of classical differential equations approach to time and frequency domain interrelationships 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 709R. 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. Each class consists of 3 hrs. lecture and 3 hrs. laboratory. Prereq. or concurrent: EE 705R. 4+4+4 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. 3 hrs. lecture and

3 hrs. laboratory. Prereq.: EE 706R, 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. Prereq.: EE 708R. 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. 3 hrs. lecture and 3 hrs. laboratory. Prereq.: EE 706R. 4 q.h.

817. *Control Analysis II.* Linear and nonlinear control system compensation techniques in the time and frequency domain. Signal flow diagrams input-output control systems, compensations to eliminate the effects of parameter variations. Prereq.: EE 703R. 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 706R, 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 703R. 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. Three hours lecture and three hours laboratory. Prereq.: Senior standing in the School of Engineering 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 709R. 4 q.h.

INDUSTRIAL ENGINEERING

Associate Professors Sorokach (chairman) and Kearns; Assistant Professor Driscoll.

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.

581. *Introduction to Industrial Engineering.* An introduction of the engineering student to the various aspects of industrial engineering, in the design, improvement, and installation of integrated systems of raw materials and equipment. 1 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 and Physics 510. (F,W,Sp) 4 q.h.

700. *Industrial Organization and Management.* The general principles of industrial organization and management. Prereq. or concurrent: Math. 740 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.

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.

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.

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. 741. (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. 740. (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 and Math. 741. (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, and Math. 741. (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. Prereq.: IE 700. (W) 4 q.h.

MECHANICAL ENGINEERING

Professors D'Isa (chairman), Charignon (dean), and Tarantine; Associate Professors Lovas, Pejack, and Petrek; Assistant Professors Arnett and Morris.

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.

502. *Descriptive Geometry.* Exercises involving points, oblique lines and oblique planes in space. Determination of distances,

angles and inter-sections: developments. Introduction to vectors. Scaling. Concurrency, network and alignment charts. Graphical treatment of mathematical concepts and operations. Prereq. or concurrent: ME 501 or 503. 3 q.h.

503. *Graphic Science.* Orthographic projection, auxiliary and oblique views, with emphasis on detail and assembly drawings. Graphs and graphic computations. Interrelationship of drawing, mathematics and science. Intended for engineering students who have had at least one year of high school drawing or the equivalent in drafting experience. 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.

581. *Introduction to Mechanical Engineering.* A course designed to acquaint first-quarter freshmen with the functions of the mechanical engineer and the advantages of pursuing mechanical engineering as a professional career. Discussions and laboratory demonstrations centered on topics of pertinent interest. Open to all students in the University. 1 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 solutions; 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 and IE 642. Prereq. 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. Prereq. or concurrent: Math. 706. 3 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: ME604. 1 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, carburetion, 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. Prereq. 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 750L. 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 esthetics, safety, and the comfort of the human body as criteria; human sensory processes as design factors; topics such as vehicular safety devices, prosthetic 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.

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 electromechanical 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 Chemical Engineering

FIRST YEAR	Hrs.
Chemistry	12
CE 581, ChE 581, EE 581, IE 581, ME 581, MS 581 Introduction to Engineering	6
Liberal arts electives	9
Calculus	9
ME 501 Engineering Drawing	3
ME 502 Descriptive Geometry	3
English	4
Health and Physical Education, Health	3
Health and Physical Education activity	1
	50

SECOND YEAR	Hrs.
Chemistry	13
ChE 680 Techniques of Chemical Engineering	3
ChE 682, 683, 684 Principles of Chemical Engineering	9
Calculus	9
Differential Equations	4
Physics	8
IE 642 Engineering Computations	4
English	4
Health and Physical Education activity	1
	55

THIRD YEAR	Hrs.
Chemistry	12
ChE 771, 772 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
Health and Physical Education activity	1
Liberal arts electives	7
	54

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 Kinetics	6
ChE 882 Process Dynamics	4
ChE 884, 885 Plant and Process Design	6
EE 714R Circuits and Electronics	4
ChE electives	6
Technical Electives	6
Liberal arts electives	8
	52

Department Technical Electives	Hrs.
ChE 685R Corrosion Control Engineering	4
ChE 686R Industrial Pollution Control	3
ChE 687 Elementary Nuclear Reactor Engineering	3
ChE 688 Energy Assessment	3
ChE 783 Engineering Plastics	3
ChE 789 Man and the Technological Society	4
ChE 883 Mathematical Methods in Chemical Engineering	3
ChE 886 Nuclear Reactor Design	4

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.
ChE 581, CE 581, EE 581, IE 581, MS 581, ME 581 Introduction to Engineering	6
Chemistry	8
Calculus	9
ME 502 Descriptive Geometry	3
Health and Physical Education, Health	3
Health and Physical Education activity	1
English	4

Physics	8
Liberal arts electives	9
	51

SECOND YEAR	Hrs.
ChE 681R Industrial Stoichiometry	4
or	
ChE 685R Corrosion Control Engineering	4
Calculus	9
Differential Equations	4
Physics	4
English	4
MatSci 601R, 602R, 603R, Introduction to Materials Science	12
MatSci 630, 631, 632 Princ. of Extractive Metallurgy	9
IE 642 Engineering Computations	4
Health and Physical Education activity	2
	52

THIRD YEAR	Hrs.
CE 601, 602 Mechanics	8
MatSci 614, 615 Structure and Properties of Materials	4
MatSci 602R Chem. Princ. of MatSci	4
MatSci 650R Atom. and Molec. Struct. of Materials	4
MatSci 740 Mech. Working of Materials	3
MatSci 741R Evaluation of Materials	3
MatSci 791R, 792R, 793R Physical Metallurgy	12
Technical electives	4
Liberal arts electives	9
	51

FOURTH YEAR	Hrs.
EE 714R Circuits and Electronics	4
MatSci 730, 731, 732 Metallography, Heat Treatment and Pyrometry	6
MatSci 860 Mech. Behavior of Materials	3
MatSci 861 Applied X-Rays I	3
MatSci 863 Thermo. of Materials I	3
MatSci 891, 892, 893 Thesis	6
MatSci general electives	6
MatSci options electives	9
Technical electives	6
Liberal arts electives	6
	52

ELECTIVES

I. General

The student may choose 6 or more hours from the courses listed below:

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 784 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 Adv. Engr. Matl. III	3

NOTE A: 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.

CORE COURSES	Hrs.
ChE 687 Elementary Nuclear Reactor Engineering	3
ChE 886 Nuclear Reactor Design	4
MatSci 830 Introduction to Nuclear Materials I	3
	10

ELECTIVES	Hrs.
MatSci 831, 835 Introduction to Nuclear Materials II, III	6
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 B: 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.

Curriculum for the Degree of Bachelor of Engineering with the Major in Civil Engineering

FIRST YEAR	Hrs.
Introduction to Engineering	6
Math##	9
ME 503 Graphic Science*	4
ME 502 Descriptive Geometry	3
Basic Science##	12
Social Studies	9
H&PE Health Education	3
H&PE activity courses	3
	49

SECOND YEAR	Hrs.
Math##	13
CE Mechanics	12
Basic Science##	8
English Composition	8
IE 642 Engineering Computations	4
CE 710 Surveying I	5
	50

THIRD YEAR	Hrs.
CE 810 Transportation	4
CE 716 Fluid Mechanics	4
ME 641 Dynamics	4
Humanities	8
Social studies	3
CE 749 Structural Analysis I	5
IE 824 Engineering Economy	4
CE 717 Hydraulic Engineering	4
CE Selective Course I**	4
ChE 681R Industrial Stoichiometry	4
ME 603 Thermodynamics I	4
	48

FOURTH YEAR	Hrs.
Thesis	6
CE 834 Environmental Engrg. I	4
CE 829 Civil Engineering Matls.	4
CE 853 Design I	4
Social studies	4
CE 881 Soil Mechanics	4
Technical Electives##	10
CE Selective Course II**	4
CE 882 Soil & Foundation Engrg.	4
EE 714R Circuits & Electronics	4
Basic Science##	4
	52

*Students deficient in high school mechanical drawing must take ME 500 and ME 501 in lieu of ME 503.

**Civil Engineering Selective Courses.

The student must take the following selective courses depending upon his Area of Concentration within the Civil Engineering curriculum:

Selective Course I: Transportation—CE 711, Structures—CE 879, Environmental—CE 875.

Selective Course II: Transportation—CE 811, Structures—CE 854, Environmental—CE 835.

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.

A major consists of 45 quarter hours. Majors should take courses in electrical circuits and networks, electronic circuits and devices, electromagnetic fields and devices, energy conversion and propagation, computer-logic circuits and systems, controls systems, communications, and/or other courses that may be appropriate to the student needs.

The electrical engineering Bachelor of Engineering degree major requires 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 (8 of which must be Humanities); 6 quarter hours of health and physical education; 8 quarter hours of English (Basic Composition I and II); and 7 quarter hours of electives generally in the area of science, mathematics or engineering to be determined in consultation with his electrical engineering advisor.

A minor is offered by the Department of Electrical Engineering. Students desiring to minor in electrical engineering may seek an electrical engineering advisor.

Requirements for the B.E. degree with a major in Electrical Engineering.

English, Basic Composition I & II	8
Health & Physical Education	6
Social studies & humanities	24
(8 hrs. of which must be humanities)	
Math.* (beyond trig.)	22
Science*	24
Electrical Engineering Major	45
General Engineering	43

*Approved by Electrical Engineering Department.

†Technical Elective.

A student may choose any 700- or 800-level technical course from engineering, mathematics, science and business administration, for which the student has prerequisites and his advisor's approval.

##These courses are to be selected with the consent of the departmental advisor.

Design, Synthesis & Systems	22
Electives	7
	201

A quarter-by-quarter arrangement of courses for each individual student is compiled and approved in consultation with the student's electrical engineering advisor.

Department Technical Electives	Hrs.
EE 555 Introduction to Modern Technology	4
EE 800 Seminar	1-4
EE 805R Quantum Electronics	4
EE 807R Pulse, Digital and Switching Circuits	4
EE 808R Electronic Circuits Signal 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 840 Electric Power Systems	4
EE 850 Communication Systems II	4

Curriculum for the Degree of Bachelor of Engineering with the Major in Industrial or Management Engineering

Industrial Engineering Curriculum

FIRST YEAR	Hrs.
Math; Calculus I, II	9
Physics; General I, II	8
English; Basic Composition I, II	8
Social Science 501	3
Psychology 501	3
ME 501 Engineering Drawing	3
Engineering 581	6
Health and Physical Education activity	3
Chem; General I	4
Basic science elective	4
	51

SECOND YEAR	Hrs.
Math; Calculus III, IV	9
Math; Differential Equations I	4
Physics; General III	4
IE 642 Engineering Computations	4
CE 601, 602 Mechanics I, II	8
Basic Science elective	4
ME 641 Dynamics	4
Humanities electives	8
Gen. engr. elective	4
	49

THIRD YEAR	Hrs.
Math; Statistics I, II	6
IE 700 Indust. Org. and Management	5
IE 711, 712 Methods I, II	6
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
EE 714R Electr. Engr.	4
Engineering Elective	4
Social Studies elective	6
Health and Physical Education 590 Health	3
	53

FOURTH YEAR	Hrs.
IE 841, 842, 843 Thesis I, II, III	6
IE 750 Intro. Engineering Relations	4
IE 800 Production Planning	4
IE 820 Quality Control	5
IE 827 Ind. Engr. Analysis	5
IE 850 Intro. Operations Research	4
IE 851 Linear Programming	4
Social Studies electives	4
Engineering elective	9
	45

Management Engineering Curriculum

FIRST YEAR	Hrs.
Engr. 581 Introduction	6
Math; Calculus I, II	9
Physics; General I, II	8
English; Basic Composition I, II	8
Sociology	8
ME 501 Engr. Drawing	3
Chem; General I	4
Health and Physical Education 590 Health	3
Health and Physical Education activity	3
	52

SECOND YEAR	Hrs.
Math; Calculus III, IV	9
Acctg. 605, 606 Elementary	10
Acctg. 713 Cost	5
IE 642 Engineering Computations	4
CE 601 Mechanics I	4
Econ; Principles I	3
Basic Science electives	8
Physics; General III	4
Marketing 624 Marketing	5
	52

THIRD YEAR	Hrs.
Econ; Statistics I, II, III	10
IE 700 Ind. Org. and Management	5
IE 824, 825 Engineering Economy	8
Econ; Principles II, III	6
IE 711, 712 Methods I, II	6
CE 602 Mechanics II	4
EE 714R Electrical Engineering	4
Acctg. 714 Cost	3
Marketing 720 Marketing	3
	49

FOURTH YEAR	Hrs.
IE 841, 842, 843 Thesis I, II, III	6
ME 641 Dynamics	4
Econ; Micro economics	3
IE 750 Engineering Relations	4
IE 800 Production Planning	4
IE 820 Quality Control	5
IE 827 IE Analysis	5
IE 850 Intro. Operations Research	4
IE 851 Linear Programming	4
Humanities electives	8
	47

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
or	
ME 503 Graphic Science	4
ME 502 Descriptive Geometry	3
IE 642 Engineering Computations	4
ChE 581, CE 581, EE 581, IE 581, MatSci 581, and ME 581 Introduction to Engineering	6
ME 580 Basic Engineering Concepts	3
Health and Physical Education 590 Health Education	3
H&PE activity	3
	50-51

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
ME 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
Elective (Social Studies)	4
Elective (Humanities)	4
Elective (Mechanical Engineering)	5
Elective (Science)	4
	52

*Students electing ME 720 are expected to take ME 821 as an ME elective.

FOURTH YEAR	Hrs.
ME 801, 802, 803 Thesis	6
Electives (Social Studies)	8
Elective (Humanities)	4
Electives (Mechanical Engineering)	30-31
	48-49
Total	200

ELECTIVES

Departmental Electives		Hrs.
804	Applied Thermodynamics	4
804L	Applied Thermodynamics Laboratory	1
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
881	Engineering Analysis	4
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.

Areas of Specialization

Three general areas of specialization in mechanical engineering are offered: mechanics of rigid and deformable solids, heat and fluid flow, and environmental studies. A student wishing to specialize in one of these areas is expected to select electives as follows: ME 851, ME 851L, ME 861, ME 861L, ME 870 and ME 870L for the mechanics of solids area: ME 804, ME 804L, ME 821, ME 830 and ME 830L for the heat and fluid flow area; and ME 823, ME 824, ME 862 and ME 872 for the environmental studies area.

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 for him to fulfill the bachelor of engineering degree requirements.

College of Fine and Performing Arts

Earl E. Edgar, Acting Dean

ORGANIZATION AND DEGREES

The College of Fine and Performing Arts consists of the Department of Art, the Department of Speech and Dramatics 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 School of Education .

The College is temporarily housed in several buildings on the campus with the administrative offices in the Arts and Sciences Building, the Thomas Mansion on Wick Avenue and Clingan Waddell Hall on Rayen Avenue. Construction is presently underway on a new 6.5-million-dollar structure which will house the College under one roof.

College of Fine and Performing Arts

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

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, History, Political Science, Psychology, Sociology, and Black Studies.

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

COURSES OF INSTRUCTION AND CURRICULUMS

ART

Professor Naberezny (chairman); Associate Professors Ives and Lepore; Assistant Professors Babisch, Bright, Juhasz, Lucas, Maddick, Mitchell, Ryska, Walusis, and Zona; Instructor Ulrich.

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 of the student and his involvement 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 major and the commercial art major are listed below.

For the Bachelor of Arts degree, the major in art history is a minimum of 45 quarter hours beyond the 500 level, of which 3 may be in philosophy.

The curriculum for the Bachelor of Arts with a major in art history is listed below.

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 him 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.

Candidates for the Bachelor of Science in Education degree will find the required art curriculums for the Provisional Special Certificate in Art Education and the Provisional High School Certificate in Art Education listed below.

BACHELOR OF FINE ARTS CURRICULUM

(Areas of concentration may be in Painting, Sculpture, Crafts, Commercial Art or Printmaking.)

See General Requirements at the beginning of the College of Fine and Performing Arts section.

Studio Art

FIRST YEAR	Hrs.
Art 513, 514 Survey of Art	6
Art 600 Theory of Art	3
Art 510, 511 Color & Design I & II	8
Eng. 550-551	8
Social Studies	8
Health & Phys. Ed.	3
Science or Math	4
Elective	4

SECOND YEAR	Hrs.
Art 601 Drawing	3
Art 602 Drawing Techniques	3
Art 606 Painting I	4
Art 611 Printmaking I	4
Art 623 Advertising Art I	3
Science or Math	12
Humanities	8
Health & Phys. Ed. (Activities)	3
Social Studies	8

THIRD YEAR	Hrs.
Art 705 Advanced Drawing	3
Art Studio Options	20
Art History Electives	6
Phil. 710 Aesthetics	4
Social Studies	4
Electives	8

FOURTH YEAR	Hrs.
Art 800 Studio Problems	10
Art History Electives (U.D.)	3
Art Studio Options	14
Electives	22

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 9 are to be in art history.

Art History

Required Courses—Art 513, 514, 600 (Philosophy 710), and 38 quarter hours of art history electives of which 3 may be in philosophy or history.

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 721 or 821, 623, 716 or 750, 724, 725, 730, 760, 767, 770, 801, 822 or 823, and 17 hours of art electives of which 9 hours are to be in art history. (NOTE: 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 5 or 6 hours of art electives.

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. 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. Prereq.: Art 510. 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 the early middle ages. 3 q.h.

514. *Survey of Art in Western Culture.* From middle ages through Renaissance and Baroque-Rococo periods to the end of the 19th century. 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. 3 q.h.

600. *Theory of Art.* An examination of the theories and philosophical implications of form in the visual arts with emphasis on contemporary thought. Required of all art and art education majors. Prereq.: Art 513 and 514. 3 q.h.

601. *Drawing.* Experience in drawing from the figure. Attention to the significance of line, the relation of shapes and their organization in established space. Prereq.: Art 510. 3 q.h.

602. *Drawing Techniques.* Academic study of figure and objects. Emphasis on sound fundamentals of figure construction. 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. Prereq.: Art 601 or 602. 4 q.h.

611. *Printmaking I.* Experimenting with all kinds of printing media. Block printing, silk screen techniques. Prereq.: Art 510. 4 q.h.

623. *Advertising Art I.* Practice with all types of lettering and illustration which apply to commercial advertising. Prereq.: Art 510. 3 q.h.

624, 625. *Advertising Art II and III.* Applying lettering, illustrations, and the principles of art to layouts; reproductions of silk screens, lino-cuts, and monoprints; study of current trends. Prereq.: Art 623 is prerequisite to 624 and Art 624 is prerequisite to Art 625. 3+3 q.h.

Upper Division Courses

703. *Painting II.* Continuation of individual exploration of techniques and development of personal tendencies. Prereq.: Art 606. 5 q.h.

705. *Advanced Drawing.* Study in composition, space division, the plastic means. Prereq.: Art 601 or 602. 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. 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. 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. 3 q.h.

716, 717. *Interior Design I and II.* Study of period furnishings, new designs, and textiles. Application of these and experiences from Art 510 to rooms and other interiors. Prereq.: Art 510. Art 716 is prerequisite to Art 717. 3+3 q.h.

721. *Printmaking II.* Concentrated experiments with lithographic technique. Prereq.: Art 611 or permission. 4 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. 3 q.h.

725, 726. *Ceramics I and II.* Pottery shaping through coiling, slab, pinching, and pottery wheel; mold making and casting; bas-relief. Prereq.: Art 511. Art 725 is prerequisite to 726. 3+3 q.h.

727, 728, 729. *Advanced Advertising Art I, II and III.* Special problems in layout and technique. The study of various media, silk screen, air brush, collage, bookplates, trademarks, containers, illustrations, booklets, and lettering that applies to the commercial field. Prereq.: Art 625. 3+3+3 q.h.

730. *Sculpture I.* Special problems dealing with form in space. Concentrated experiments with wood, plaster, or stone techniques. Prereq.: Art 511. 4 q.h.

731. *Sculpture II.* Special problems dealing with form in space. Concentrated experiments with metal techniques. Prereq.: Art 511. 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.* 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 North and South American continents, and in particular Central America. Special emphasis on Pre-Hispanic Mexico, Peru, and North American high cultures such as the Maya, Inca, and Northwest coastal tribes. 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. Prereq.: Art 511. Note: Art 750 is prerequisite to 751. 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. 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. 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. Prereq.: Art 511. 4 q.h.

771. *Jewelry II.* A study of the casting processes used in the creation of jewelry. Prereq.: Art 511. 4 q.h.

780. *Photography I.* Lecture and lab course in photographic fundamentals, developing, and printing. Discussion of cameras, lenses, and enlargers. Technical and visual knowledge relating to the photograph as an expressive art form. (Student must provide camera.) Prereq.: Art 510 or permission. 4 q.h.

781. *Photography II.* Continuation of Art 780. Concentration on the student's technical ability and visual awareness of fine art photography. (Student must provide camera.) Prereq.: Art 780. 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 ten 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.) 1 q.h.

803. *Painting III.* Concentration of individual techniques. 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. Prereq.: Art 726. 3+3 q.h.

812. *Sculpture III.* Concentrated exploration of techniques developed in Art 730 or 731. 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. 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. 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. Prereq.: Art 767 or permission. 3 q.h.

SPEECH AND DRAMATICS

Associate Professors Elser (chairman), Hulsopple, and O'Neill; Assistant Professor Robinson; Instructors Castronovo and Shale.

The Bachelor of Fine Arts degree (see curriculum listed below) is available to students majoring in the performance areas (acting, directing, and scene design). For requirements of the Bachelor of Arts degree, see the College of Arts and Sciences section. The requirements for the Bachelor of Science in Education are given in the School of Education section.

Speech and Dramatics majors working toward the Bachelor of Arts degree are expected to complete a minimum of 45 quarter hours with emphasis in one of three areas: Public Address, Theatre, or Radio and Television.

The prerequisites to courses in Speech are Principles of Speech 553 or Business and Professional Speaking 652, or preparation satisfactory to the teacher or department chairman.

BACHELOR OF FINE ARTS CURRICULUM

Basic Composition	8 hrs.
Health and Physical Education	6 hrs.
Social Studies	20 hrs.
Science/Mathematics	16 hrs.
Humanities	12 hrs.

Speech

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	4 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.
861	History of the Theatre	5 hrs.
863	Advanced Acting	4 hrs.
864	Advanced Directing	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.
	General electives	35-36 hrs.
		186 hrs.

*Note: With departmental permission H&PE 545R, and 546R, may be substituted for 540R, and 541R.

Lower Division Courses

553. *Principles of Speech.* This course is 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. The student will be expected to relate these principles to the demands of the speech-communications situations. Prereq.: None. 3 q.h.

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. Prereq.: None. 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 insure adequate practical experience in the scenic arts and crafts. Prereq.: None. 4 q.h.

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.: 553 and 560. 3 q.h.

605. *Voice and Diction.* A fundamental study of the voice mechanism; breath control, enunciation, articulation, vocal variety. Prereq.: None. 4 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 insure adequate practical experience. Prereq.: None. 4 q.h.

623, 624. *Rehearsal 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.

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. Prereq.: None. 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.: 553 or 652. 3 q.h.

654. *Argumentation and Debate.* Principles and practices of formal argumentation including analysis of issues, evidence, reasoning and refutation. Prereq.: 553 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 writing of constitutions. Prereq.: None. 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.: 553 or 652. 4 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.

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.

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. Prereq.: None. 4 q.h.

680. *Radio and Television Announcing.* A study of the announcer's role in radio and television stations. Basic principles and practices of announcing and broadcast operation. Class and laboratory. Prereq.: 553 or 652, 580, and 605. 3 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.: Junior standing or consent of the instructor. 4 q.h.

Upper Division Courses

705. *Speech Problems for the Classroom Teacher.* 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. Prereq.: None. 3 q.h.

750. *Speech Criticism.* This course will explore approaches to the critical evaluation of significant speeches past and present. Rhetorical, literary, historical, linguistics, and quantitative methods of criticism will be analyzed. Prereq.: 553 or permission of the instructor. 4 q.h.

751. *Greek and Roman Public Address.* This course will explore the rhetorical techniques of the major Greek and Roman orators, such as Demosthenes, Isocrates, Gorgias, Cicero, Hannibal, St. Augustine, and St. Ambrose. Prereq.: 553 or 652. 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.: 553 or 652. 4 q.h.

754. *Persuasive Speaking.* This course will concentrate on the rhetorical and socio-psychological theories of persuasion. Students will prepare and present a series of persuasive speeches throughout the quarter. Prereq.: 553 or 652. 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.: 553 or 652. 4 q.h.

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.* An 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.

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.

780. *Advanced Radio and TV Announcing.* Prereq.: 680. 3 q.h.

781. *Radio Production.* Study of the concepts of radio production and programming. Production of various types of radio programs. Prereq.: 580 and 680, 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 and 680 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.

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 or 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.: 553 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.: 553 or 652. 4 q.h.

852. *The Process of Group Interaction.* This course is a correlate to 653 Principles of Discussion and Conference. The primary focus of the course is a description of communication variables in the small group setting. In addition, the course will survey the literature related to communication in the small-group situation. Prereq.: 653. 4 q.h.

861. *History of the Theatre.* A history of the physical theatre and the written drama from antiquity to the present. Emphasis on theatre architecture and stagecraft, including scenery, costumes and lighting. Prereq.: Sophomore standing or consent of the instructor. 5 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 743 or permission of the instructor. 4 p.h.

863. *Advanced Acting.* A study of spe-

cific 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.

897. *Seminar in Broadcasting.* This course is designed to provide the student with opportunities to investigate contemporary problems in radio and television. Prereq.: Senior standing in Speech-Radio or permission of the instructor. 3 q.h.

898. *Seminar in Public Address.* This course is designed to provide the student with opportunities to explore the areas in public address not covered in the regular course offerings. Prereq.: Senior standing in Public Address or permission of the instructor. 3 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. Specific course offerings under this course title will include: Advanced Scene Design, Advanced Stage Lighting, Theatre Styles, Theatre Organization and Management, and Modern Techniques and Procedures in the Contemporary American Theatre. Senior standing in Theatre or permission of the instructor. 3 q.h.

The Dana School of Music

Donald W. Byo, Acting Director

ORGANIZATION AND DEGREES

OBJECTIVES

The Dana School of Music of Youngstown State University began in 1869 as Dana's Musical Institute in Warren, Ohio. It was merged with Youngstown College in 1941.

The purpose of the Dana School of Music of Youngstown State University 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 the theory upon which all music rests, and to provide for the non-music major an opportunity to develop his 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 School offers instruction for both professional and avocational needs. Provided that they are capable of college-level work, students of the University who have studied voice or an instrument may continue the study of music, subject only to limitations imposed by their respective schools or divisions.

The curriculums of the Dana School of Music may be divided into four components: Music Education, Theoretical Studies, Liberal Arts, and Applied Music.

The School of Music offers courses leading to the degree of Bachelor of Music, with the major in piano, organ, voice, any standard string or wind instrument, percussion, theory, composition, or music education. It

also provides the courses for the major in the history and literature of music, music theory, and applied music, for the degree of Bachelor of Arts.

With the cooperation of the School of Education, the Music Education Department prepares students for certification as music teachers in public schools and also provides the music courses needed for the general elementary teaching certificate. Music education students have ample opportunity for practice teaching, since the University cooperates closely with the public schools of Youngstown and vicinity.

Credit in music is allowed in varying amounts toward the other degrees granted by Youngstown State University.

BUILDINGS

The School's main building contains the administrative offices, 13 studios, four classrooms, four soundproof record-playing rooms, and the record library. The Dana Recital Hall, at the corner of Bryson and Spring streets, contains studios, a rehearsal hall, and a recital hall. The Dana Annex, directly behind the main music building, contains 20 soundproof practice rooms and a pipe organ practice room. In the Instrumental Rehearsal Building are two studios and a large rehearsal hall for the University bands and orchestra. Frequent use is made of the C. J. Strouss Memorial Auditorium for concerts and recitals. The Dana Recital Hall, with a seating capacity of 300, serves as an excellent hall for chamber music and solo recitals. In addition, the University leases organ practice and teaching time at three churches adjacent to the campus.

EQUIPMENT

Equipment includes 22 Steinway pianos, 31 other pianos, harpsichords by William Dowd and Kurt Sperrhake, a five-stop portative organ by Hermann Schlicker, two practice organs, consorts of recorders and krummhorns, a cornetto, and a comprehensive collection of standard band and orchestra instruments. The organs of St. John's Episcopal Church (Schlicker, 3 manuals, 49 ranks), and First Presbyterian Church (Austin, 4 manuals, 75 ranks) are available for teaching and practice.

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 University Library contains books and music for study by students in music literature, music education, and theory classes. The record library, located in the Dana School for easy access to class work and for use by the students in the several listening rooms, is representative of the complete field of music history and literature. The School of Music invites students of other schools of the University to make use of the listening opportunities available.

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 Placement Service 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. Attendance at recitals is obligatory for music students. Additional hours of credit in the major field may be required if attendance is impossible.

The *Concert Choir* is a select chorus which performs a wide range of works from the choral repertoire. Membership is by audition.

The *Madrigal Singers* is for selected graduate and undergraduate students. It

is a small ensemble of singers for the study and performance of music from all periods and repertoires.

The *University Chorus* is a mixed chorus open to any student in the University who can qualify. Literature studied will include as wide a variety of periods and styles as is practical.

The *Men's Chorus* is a select group performing the finest of male chorus literature. It is open to any man in the University who can qualify by audition.

The University bands are an integral part of campus life and are open to all students in the University. The *Marching Band* functions during the football season. Twirlers for this group are auditioned in the spring quarter prior to a new season. The *Wind Ensemble* and *Concert Band* perform a wide range of works from the wind band literature. For further information contact the Director of Bands.

The *Jazz Ensemble* is open to any student in the University by audition. Technics related to the current jazz scene are explored and developed, including improvisation. This ensemble performs regularly on and off campus.

The *Symphony Orchestra* provides opportunity for musical growth and development in its presentations of symphonic works. It possesses an adequate library of symphonic and chamber music. It also accompanies choral concerts and the opera productions. It is open to all students in the University who can qualify.

Opera is a tradition at Youngstown State University. Besides programs of short operas and scenes from operas, there is an annual major production of a work from standard opera repertory. Most members of the casts are students of the Dana School of Music, but qualified students in the University may audition for the cast and the opera chorus.

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 section.

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 below 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 he must meet certain standards in technique and repertory. His qualifications are determined by the placement tests mentioned above; and the student not qualifying for the first

regular course in his major branch of applied music takes preparatory work until he is 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 his 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 to admit him 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 he satisfies all the graduation requirements for the degree he seeks. 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 he can undertake 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 Dean of the Dana School of Music.

COURSES OF INSTRUCTION AND CURRICULUMS†

FACULTY

Professor Walker; Associate Professors Alleman, Byo, Fleming, Gould, L. M. Hopkins, R. E. Hopkins, Pellegrini, Raridon, Sample, Slocum, Spiro, Vogel, and Wharton; Assistant Professors Hailstork, Kagarice, Largent, Mayhall, Mould, Orr, Parlink, Rosenberg, Rudnytsky, Starkey, and Turk; Instructors Harris, Lapinski, and Way.

ENSEMBLES

To enable students in music to have wide experience in the performance of music written for large instrumental and vocal groups, they are required to participate in music ensembles as follows: String majors are required to be members of the University Orchestra for each quarter of the four years. All other instrumental majors are required to be in University Band for each quarter of the four years. (Wind majors who are accepted by audition for orchestra may meet their ensemble requirement by partici-

†The student should familiarize himself 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.

pating in orchestra.)* Voice majors must participate in a major choral ensemble* for each quarter of the four years; piano and organ majors follow the ensemble requirements 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.

Concert Choir. Open to any student in the University who can qualify. 1 q.h.

Madrigal Singers. Open to any student in the University who can qualify. 1 q.h.

University Chorus. Open to any student in the University who can qualify. 1 q.h.

Men's Glee Club. Open to male students in the University who can qualify. 1 q.h.

Wind Ensemble, Concert Band and *Marching Band* are open to any student in the University who can qualify. Three hours of Marching Band credit may be applied toward the Health and Physical Education activity requirement. 1 q.h.

Opera Workshop. Open to all students of the University who are interested in the art and craft of stage production and the lyric theater. Students may audition for roles, in which they will be prepared musically and dramatically. In a practical working atmosphere, study is also offered in stage lighting, the making of sets, costuming, makeup, etc. 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. Students may also enroll without credit. 1-3 q.h.

Symphony Orchestra. Open to any student in the University who can qualify. 1 q.h.

Percussion Ensemble. Limited to students of the School of Music. 1 q.h.

String Ensemble. Open to any University student who can qualify. 1 q.h.

Woodwind Ensemble. Limited to students of the School of Music. 1 q.h.

Brass Ensemble. Limited to students of the School of Music. 1 q.h.

String Quartet. Limited to selected students of the School of Music. 1 q.h.

Jazz Ensemble. A laboratory experience in jazz techniques. Emphasis is on analysis of harmonic progressions, form, and performance requirements of this musical idiom. 1 q.h.

PERFORMANCE

Acceptance into an applied area is contingent upon an audition. The student not qualifying for regular major status may take the relevant course 500 until his deficiency is overcome.

Advanced standing in applied music 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 applied music requirements without taking the designated courses may earn in other music courses as many quarter hours as he would 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 him. 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 3 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 2 hours daily. Students registered for 2 q.h.

*The director may waive ensemble participation in exceptional cases and during the student teaching quarter. The major instrumental ensembles are Band (Concert and Marching) and Symphony Orchestra. The major choral ensembles are University Chorus and Concert Choir.

courses receive 25 minutes of individual instruction and are required to practice 1 hour daily.

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 his 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 (p. 232), subject to approval by the appropriate performance faculty.

No credit will be given in an applied music course if the student misses more than three lessons. In case of prolonged illness the lessons may be made up at the discretion of the teacher.

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. 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 3 quarters at 2 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;* Poulenc, *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

500. For those who do not qualify for Voice 504. The course may be repeated. 2 q.h.

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. He should have 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 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

500. For those who do not qualify for Violin 504. The course may be repeated. 2 q.h.

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 in three octaves, using fundamental strokes. 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. Not fewer than six compositions added to repertoire. Scales in double stops in all keys. Technical material from Sevcik, Op. 4, Part 4; Schradick, Book II. 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.

Viola

500. For those who do not qualify for Viola 504. The course may be repeated. 2 q.h.

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. 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.

Cello

500. Intended for those who do not qualify for Cello 504. This course may be repeated. 2 q.h.

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.

String Bass

500. For those who do not qualify for String Bass 504. The course may be repeated. 2 q.h.

Major Courses

507, 508, 509. 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. Bille, *Method,* Part II, Books 4 and 5. Concert Pieces to include sonatas by Eccles, Antoniotti, and D'Andrieu. 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.

Guitar

500. Intended for those who do not qualify for Guitar 504. The course may be repeated. 2 q.h.

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. Bachelor of Music-Applied students must present a public 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

500. To be elected by students who do not qualify for Flute 504. The course may be repeated. 2 q.h.

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* and at least six additional sonatas from the Baroque. 4+4+4 q.h.

607, 608, 609. Continued development of technic, articulation, phrasing and tone quality. Repertoire expanded to include all Bach *Sonatas;* Mozart *Concertos in G major* and *D major;* and three additional concerti from the works of C. P. E. Bach, Haydn, Quantz or Telemann. 6+6+6 q.h.

707, 708, 709. Emphasis on the instrument in a chamber role and the study of solo works such as Schubert, *Variations;* Beethoven, *Serenade, Op. 41;* and the *Sonatas* by Piston and Poulenc. 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 works to include Dutilleux, *Sonatine;* Prokofieff, *Sonata;* Debussy, *Trio for flute, viola and harp.* 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.

Clarinet

500. To be elected by those who do not qualify for Clarinet 504. The course may be repeated. 2 q.h.

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;* Bernstein, *Sonata;* 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;* Heiden, *Sonata;* and the *16 Solos de Concert* (Bonade). 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;* Debussy, *Premier Rhapsody;* 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 Suite.* 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.

Oboe

500. For those who do not qualify for Oboe 504. This course may be repeated. 2 q.h.

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 No. 1 and No. 3;* Still, *Incantation and Dance;* Sammartini, *Sonata in G;* and Eichner, *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;* and Horovitz, *Sonatina, Op. 3.* 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 including the memorization of major orchestral passages. Additional solo works to include Piston, *Suite;* Jacob, *Rhapsody for English Horn;* Vaughan Williams, *Concerto;* and 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 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.* 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.* 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 607, 608, 609. 2+2+2 q.h.

Bassoon

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 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.

Saxophone

500. To be elected by those who do not qualify for Saxophone 507. This course may be repeated. 2 q.h.

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;* Milhaud, *Scaramouche;* Tomasi, *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;* Larson, *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.

Trumpet

500. To be elected by those who do not qualify for Trumpet 504. This course may be repeated. 1 q.h.

Major Courses

504, 505, 506. The development of fundamental physical and technical procedures for the purpose of acquiring correct tone production, embouchure, and breath control. Study of material such as W. Smith; Arbans; Clarke's technical and characteristic studies; Etudes by Hering and V. Brandt. Major and Minor scales and chords, transposition, sight reading and solo literature of Balay, Bozza, Pietzsch, Barat, Latham and Haydn. A weekly performance seminar. Attendance required at departmental solo and chamber music performances. 4+4+4 q.h.

607, 608, 609. The study of solo and chamber literature to aid in the development of technic and musicianship. Orchestral literature, transposition studies and further work on major and minor scales and chords. Methods such as Schlossberg, Sachse, Charlier and Pietzsch. Weekly performance seminar. Participation and attendance in departmental solo and chamber literature performances required. 6+6+6 q.h.

707, 708, 709. Continuation of technical and tonal development using methods such as Clarke, Arban, Charlier, Sachse, Petit, W. Smith, Tomasi and Pietzsch. Further work with orchestral and chamber literature. Sight reading. Solos by Vidal, Barat, Bozza, Hindemith, Giannini, Kennan, etc. Introduction to the C and D trumpets. A weekly performance seminar. Participation and attendance in departmental solo and chamber literature performances required. Half-hour recital. 6+6+6 q.h.

807, 808, 809. Continued study of C and D trumpet literature. Extensive use of the orchestral and chamber literature of the Baroque, Classical and Contemporary styles to aid in further musical development. Sight reading, transposition and solo and chamber music study. Preparation of senior recital. A weekly performance seminar. Participation and attendance in departmental solo and chamber performances required. Study of solos such as Tomasi, Jolivet, Stevens, Telemann and Purcell. One-hour 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 Trumpet 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Trumpet 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Trumpet 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Materials suited to the needs of the student. Weekly performance seminar. Attendance at departmental recitals. 2+2+2 q.h.

601, 602, 603. Materials suited to the needs of the student. Weekly performance seminar. Attendance at departmental recitals. 2+2+2 q.h.

701, 702, 703. Materials suited to the needs of the student. Participation in and attendance at departmental solo and chamber performances. 2+2+2 q.h.

801, 802, 803. Materials suited to the needs of the student. Weekly performance seminar. Participation in and attendance at departmental solo and chamber performances. 2+2+2 q.h.

French Horn

500. For those who do not qualify for French Horn 504. The course may be repeated. 1 q.h.

504, 505, 506. Establishment of a practice routine to promote fundamental skills such as tone production, breath control, embouchure, flexibility, legato and staccato articulations. Major and minor scales, transposition, and sight reading. Introduction to orchestra excerpts. Studies by Kopprasch, Alphonse, Franz, Paudert. Cantabile solos and other Grade III and IV solos. Participation and attendance at weekly seminar performance class. Departmental recitals required. 4+4+4 q.h.

607, 608, 609. Continuation of technical studies. Kopprasch, Alphonse, Pottag. Orchestral studies, transposition and sight reading. Solos of Grade III and IV difficulty. Participation and attendance at weekly seminar performance classes. 6+6+6 q.h.

707, 708, 709. Further study of the technical problems of the horn. Alphonse, Pottag, Gallay, Hoss and Kling. Orchestral studies, transposition and sight reading. Solos of Grade IV and V difficulty. Performance in and attendance at weekly seminar class. Junior recital. 6+6+6 q.h.

807, 808, 809. Advanced studies using Pottag, Gallay, Alphonse, Hoss, Mueller and Reynolds. Orchestral studies, transposition and sight reading. Solos of Grade V and VI difficulty. Senior recital. Participation in and attendance at weekly seminar classes. 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 French Horn 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See French Horn 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See French Horn 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Material suited to the needs of the student. Attendance required at weekly performance seminar and departmental recitals. 2+2+2 q.h.

601, 602, 603. See 501, 502, 503. 2+2+2 q.h.

701, 702, 703. See 501, 502, 503. 2+2+2 q.h.

801, 802, 803. See 501, 502, 503. 2+2+2 q.h.

Trombone

500. For those who do not qualify for Trombone 504. This course may be repeated. 1 q.h.

Major Courses

504, 505, 506. The development of a daily practice routine to enable the individual to acquire fundamental skills such as tone production, flexibility and legato and staccato articulations. All major and minor scales in eighth notes; introduction to tenor and alto clef; sight reading; study materials by Rochut, Blume, Kopprasch, Tyrrell, Pederson, and Fink; solos by Telemann, David, Smith, Jacob, Vivaldi and Bach; participation in weekly seminar; required attendance at and participation in departmental solo and chamber recitals. 4+4+4 q.h.

607, 608, 609. Continued development of tone production, articulations, and technical skills; tenor and alto clef; sight reading; studies by Blazhevich, Arban, Kopprasch, Rochut, orchestral excerpts by Brown & Stoneberg; solos by Rimsky-Korsakov, Mozart, Boda, Marcello, Handel and Hindemith; weekly seminar class; required attendance at and participation in brass departmental solo and chamber recitals. 6+6+6 q.h.

707, 708, 709. Continuation of basic studies; studies by Rochut, Blazhevich, Lafosse, Blume, Pederson, Arban; orchestral excerpts by Brown and Stoneberg; solos by Stojoski, Bozza, Hindemith, Vivaldi, Hartley, White and J. S. Bach; weekly class seminar; required attendance at and performance in brass departmental solo and chamber recitals. 6+6+6 q.h.

807, 808, 809. Advanced studies by Rochut, Kahila, Lafosse, Pederson and Maxted; solos by J. S. Bach, C.P.E. Bach, Hindemith, Serocki, Serly, Creston and Druckman; orchestral excerpts; preparation and performance of one-hour recital; weekly class seminar; attendance at and performance in brass departmental solo and chamber music recitals. 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 Trombone 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Trombone 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Trombone 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Studies to develop embouchure, attacks, release, breath control, tone quality and knowledge of positions; studies by Cimera, Endressen, Arban and Hovey; selected solos; weekly class seminar; attendance at brass departmental solo and chamber music recitals. 2+2+2 q.h.

601, 602, 603. Material suited to the needs of the student; weekly class seminar; attendance at and performance in brass departmental solo and chamber music recitals. 2+2+2 q.h.

701, 702, 703. See 601, 602, 603. 2+2+2 q.h.

801, 802, 803. See 601, 602, 603. 2+2+2 q.h.

Tuba

500. For those who do not qualify for Tuba 504. This course may be repeated. 2 q.h.

Major Courses

504, 505, 506. The development of fundamental skills, such as tone production, embouchure, breath control, flexibility, and legato and staccato articulations. Major scales in eighth notes. Studies by Cimera, Eby, Arban, Rochut, and Kopprasch. Sight reading; cantabile solos of grade III difficulty including Wekselblatt collection, works by Purcell, Beethoven, and Bach. 4+4+4 q.h.

607, 608, 609. Studies by Kopprasch, Arban, Rochut, and Vasiliev. All major and minor scales in eighth notes; sight readings; solos of grade III and IV difficulty including works by Lebedev, Marcello, Hartley, Bach, Frackenpohl, and others. 6+6+6 q.h.

707, 708, 709. Continuation of technical studies. Materials by Blazhevich, Vasiliev, Rochut, Bernard and others. All scales and arpeggios in eighth notes; solos of grade IV and V difficulty by Hindemith, Beversdorf, Vaughn Williams, and horn solos by Strauss and Mozart. Performance of brass chamber literature required. 6+6+6 q.h.

807, 808, 809. Continuation of technical studies. Emphasis on orchestral excerpts collected by Brown, Stoneberg, and Sear. Solos of grade V and VI difficulty. Performance of brass chamber literature required. 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 Tuba 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Tuba 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Tuba 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Introduction to fundamental skills, such as tone production, development of embouchure, attack and release, breath control, tone quality, flexibility. Introduction to scales. Studies by Eby, Arban, Hovey. Cantabile solos. 2+2+2 q.h.

601, 602, 603. Continuation of development of skills stressed in grade I. Scale and chord studies. Extension of range. Studies by Eby, Arban, Hovey. Cantabile solos. 2+2+2 q.h.

701, 702, 703. Studies and solos of the level indicated for Tuba 507, 508, 509. 2+2+2 q.h.

801, 802, 803. Continued on a more advanced level. For those who qualify. 2+2+2 q.h.

Baritone Horn

500. For those who do not qualify for Baritone Horn 504. This course may be repeated. 2 q.h.

Major Courses

504, 505, 506. The development of a daily practice routine to enable the individual to acquire the fundamental skills, such as tone production, embouchure, breath control, flexibility, and legato and staccato articulations. All major scales in eighth notes; knowledge of bass, treble and tenor clefs; sight reading; study materials by Rochut, Blume, Mueller, and Arban. Cantabile solos

by Barat, Telemann, David Henry Smith solo collection and other solos of grade III and IV difficulty. 4+4+4 q.h.

607, 608, 609. Continuation of technical studies. All major and minor scales in eighth notes with any articulations. Sight reading; solos of grade III and IV difficulty including works by Sanders, McKay, Handel, and Marcello. 6+6+6 q.h.

707, 708, 709. Continuation of basic technical studies with materials by Rochut, Blume, Lafosse, Kopprasch. All scales and arpeggios in any articulation in eighth notes. Solos of grade IV and V difficulty including works by Rimsky-Korsakov, Jacob, Boda, Stojowski. Performance of brass chamber literature required. 6+6+6 q.h.

807, 808, 809. Advanced studies by Rochut, emphasis on band and orchestral excerpts. Solos of grade V and VI difficulty including works by Bach, Handel, Serocki, Hartley, Beasley, and White. Performance of brass chamber literature required. 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 Baritone Horn 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Baritone Horn 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Baritone Horn 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Studies to develop embouchure, attack, release, breath control, tone quality, flexibility. Studies by Cimera, Hovey, Endressen. Selected cantabile solos. 2+2+2 q.h.

601, 602, 603. Continuation of development of skills stressed in grade I. Scale studies, stressing legato and staccato articulation. Extension of range. Studies by Mueller, Cimera. Study of cantabile solos for development of legato-cantabile style. 2+2+2 q.h.

701, 702, 703. Studies and solos of the level indicated for Baritone 507, 508, 509. 2+2+2 q.h.

801, 802, 803. Continued on a more advanced level. For those who can qualify. 2+2+2 q.h.

Percussion

500. To be elected by those who do not qualify for Percussion 504. The course may be repeated. 2 q.h.

Major Courses

504, 505, 506. Snare drum: review and/or complete twenty-six rudiments. Stone, *Stick Control;* Wilcoxon, *Modern Methods.* Studies for independence of hands. *Gardner, Progressive Studies,* Book III; Moeller, *Rudimental Drumming.* Relaxation. Bass drum, cymbals, and accessories. Mallet instruments, including bells, xylophone, marimbas, and vibraharp; malleting, roll, scales, arpeggios. Peterson, *Rubank Elementary Method;* graded violin, saxophone, and clarinet exercises. 4+4+4 q.h.

607, 608, 609. Snare drum: *Moeller, Rudimental Solos;* Wilcoxon, *Rudimental Swing.* Foot studies for bass drum. Gardner, *Postgraduate Studies;* Rale and Morales, *Latin-American and Afro-Cuban Rhythms.* Mallet instruments: keyboard harmony, phrasing, expression; solos and excerpts from standard compositions; Peterson, *Three and Four-mallet Playing.* Tympani: position, mechanics, attack, single strokes tuning; ear-training exercises; Gardner, Sietz, and Cross Methods. 6+6+6 q.h.

707, 708, 709. Snare drum: Moeller, Wilcoxon, and Bellson methods. Mallet instruments: solos for two, three, and four mallets. Tympani: advanced studies; technical problems, cross-sticking, fast tone changes. Excerpts from classic and modern compositions. Use of pedal, pedal effects, glissandi. Gardner, Sietz, Cross, and Zettleman methods. 6+6+6 q.h.

807, 808, 809. Snare drum: hand and foot independence studies; rudimental solos. Mallet instruments: Musser transcriptions of Chopin; Musser, *Masterworks for Vibraharp.* Modern solos by Norvo and others. Tympani: modern arrangements, concertos, and solos by Stock, Berlioz, Stiegler and others. 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 Percussion 607, 608, 609. 4+4+4 q.h.

704, 705, 706. See Percussion 707, 708, 709. 4+4+4 q.h.

804, 805, 806. See Percussion 807, 808, 809. 4+4+4 q.h.

Minor Courses

501, 502, 503. Snare drum: position, mechanics of playing, muscular action, method of attack, relaxation. Rudiments, including single-stroke roll, double-stroke roll, five-, seven-, and nine-stroke rolls, flams, three- and four-stroke ruffs. Primary exercises. Harr, Book I and II. Gardner, *Progressive Studies,* Book I. 2+2+2 q.h.

601, 602, 603. Snare drum: rudiments, including flam taps, flam accents, flamacues, single, double, and triple paradiddles, half-drags, single drags. Exercises. Harr, Book II; Gardner, *Progressive Studies,* Book II. 2+2+2 q.h.

701, 702, 703. Snare drum: Stone, *Stick Control;* Wilcoxon, *Modern Methods;* Gardner, *Progressive Studies,* Book III. Mallet-played instruments (bells, xylophone, marimba, vibraharp): malleting, roll scales, arpeggios. Exercises; Peterson, *Rubank Elementary Method.* Graded violin, saxophone, and clarinet exercises. 2+2+2 q.h.

801, 802, 803. Continued on a more advanced level. For those who can qualify. 2+2+2 q.h.

THEORY AND COMPOSITION

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.

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.

504, 505, 506. *Composition A*

604, 605, 606. *Composition B*

Composition for Majors. Class 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

750. *Analytical Techniques.* Analysis of representative repertoire from the Renaissance, Baroque, Classical, Romantic, and Contemporary periods. Prereq.: Music 612. 4 q.h.

753. *Counterpoint I.* Study of the medieval modes; harmonic, melodic, rhythmic, and contrapuntal aspects of the sixteenth-century vocal polyphony. One recitation a week is devoted to sight-singing and ear-training in the style of the period, with special emphasis on the works of Palestrina and Lassus. Prereq.: Music 612. 3 q.h.

754. *Counterpoint II.* Study of the eighteenth-century contrapuntal technique. Analysis of the works of Bach, culminating in composition of two- and three-part inventions by the student. Class meets three times a week. Prereq.: Music 612. 3 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. Prereq.: Music 612. 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.

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.

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 and Service Playing.* A study of the representative literature of the organ, with an emphasis on the service playing of hymns, anthems, and solos. The fundamentals of improvisation, modulation, and transposition. 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.

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. Representative works of Schumann, Berlioz, Brahms, etc., will be studied. Prereq.: Music 612 and 772. 3 q.h.

875. *Contemporary Music.* Study of musical conditions existing at the end of the nineteenth century; new aesthetics, impressionism, expressionism, and neo-classicism, and the musical techniques associated with them. Principal composers of the twentieth century, including Bartok, Stravinsky, Debussy, Schoenberg, Prokofieff, and others, and a selected list of their chief masterworks are studied. This course will be offered simultaneously with Music 830 (Materials of 20th Century Music). 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. Three classes a week. 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 his ability to discover the implications of the score. Four classes a week. Practical work with chorus. 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 his ability to discover the implications of the score. Four classes per week. Students perform on minor instruments providing an ensemble for practice in conducting. Prereq.: Music 611 with a grade of *B* or better or 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.

621. *Music Literature and Appreciation.* A survey course with emphasis on the development of listening techniques. Music of the past and present studied as a reflection of its social and cultural milieu. For non-music majors. Prereq.: Music 521. 3 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.

730. *Woodwind Methods.* Basic instruction in flute, oboe, clarinet, alto saxophone, and bassoon. School music methods are emphasized and members of the class are asked to meet a required level of performance. Meets five hours a week. 3 q.h.

731. *String Methods.* The student receives instruction in each of four string instruments. He is examined on his basic understanding and performance. The problems of teaching strings are the point of concentration. Meets five hours a week. 3 q.h.

732. *Brass Methods.* Meets five days per week for one quarter. Each student will learn the playing fundamentals of the trumpet, French horn, trombone, baritone and tuba. For non-brass majors only. 3 q.h.

733. *Percussion Methods.* The demonstration, teaching and playing techniques of all percussion instruments. Also purchasing, repairing and the make-up of all percussion instruments. 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.

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 Techniques.* Organizing and conducting the marching band. Gridiron charting and marching procedures with a study of precision drill, formations, and pageantry; instrumentation and arranging for field playing. 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

528. *Clarinet Class.* Class instruction in elementary principles of clarinet performance and pedagogy. 1 q.h.

530. *Cello Class.* Class instruction in elementary principles of cello performance and pedagogy. 1 q.h.

531. *Violin Class.* Class instruction in elementary principles of violin performance and pedagogy. 1 q.h.

540, 541, 542. *Voice Class.* Class instruc-

tion in elementary principles of voice performance and pedagogy. 1+1+1 q.h.

550. *Trumpet Class.* Class instruction in elementary principles of trumpet performance and pedagogy. 1 q.h.

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. 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. 1+1+1 q.h.

680, 681, 682. *Keyboard Musicianship II.* A continuation and intensification of studies begun in Music 560, 561, and 562, with emphasis on accompanying, modulation, repertoire, and stylistic analysis. 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.

CURRICULUMS

Curriculum for the Degree of Bachelor of Music with Major in Piano or Organ

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
Communication	8
Soc. Stud./Sci./Math. electives**	6
Health Education 590	3
	44-50

SECOND YEAR	Hrs.
Performance Major 607, 608, 609	18
Theory 610, 611, 612	12
Accompanying 690, 691, 692	3
Soc. Stud./Sci./Math. electives**	18
	51

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
	49

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
	44-45

Total 188-195

*Organ and harpsichord majors only.

Curriculum for the Degree of Bachelor of Music with Instrumental Major

FIRST YEAR	Hrs.
Performance Major 504, 505, 506	12
Keyboard Musicianship I	3
Theory I, 570, 571, 572	12
Major Ensemble	3
Communication	8
Social Studies elective	12
	50

SECOND YEAR	Hrs.
Performance Major 607, 608, 609	18
Keyboard Musicianship II	3
Theory II, 610, 611, 612	12
Music History 770, 771, 772	12
Major Ensemble	3
	48

*Organ and harpsichord majors only.

**Must include at least 16 q.h. of social studies and at least 4 q.h. of science/mathematics.

***Piano majors only.

THIRD YEAR	Hrs.
Performance Major 707, 708, 709	18
Theory 750	4
Theory elective	6
Major Ensemble	3
Chamber Ensemble	3
Conducting	3
Science elective	4
Science, Physics 608	4
H&PE Activities	3
	48

FOURTH YEAR	Hrs.
Performance Major 807, 808, 809	18
Music History elective	3
Theory Hist./Lit. or Conducting elective	12
Major Ensemble	3
Social Studies electives	8
H&PE 590	3
	47

Total 193

Curriculum for the Degree of Bachelor of Music with Major in Voice

FIRST YEAR	Hrs.
Voice 504, 505, 506	12
Keyboard Musicianship I	3
Theory 570, 571, 572	12
Major Ensemble	3
Communication	8
Social Studies elective	12
	50

SECOND YEAR	Hrs.
Voice 607, 608, 609	18
Keyboard Musicianship II	3
Theory 610, 611, 612	12
Music History 770, 771, 772	12
Major Ensemble	3
	48

THIRD YEAR	Hrs.
Voice 707, 708, 709	18
Theory 750	4
Major Ensemble	3
Conducting	3
Italian*	8
Science elective	4
Physics 608 Sound	4
H&PE Activities	3
	47

FOURTH YEAR	Hrs.
Voice 807, 808, 809	18
Music History electives	6
Vocal Pedagogy 880, 881	4
Social Studies electives	8
French and/or German*	8-16
H&PE 590	3
	47-55

Total 192-200

*2 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	4
Methods Courses	9
Major Ensemble	3
Communication	8
	48

SECOND YEAR	Hrs.
Composition 604, 605, 606	6
Theory 610, 611, 612	12
Piano 601, 602, 603	6
Applied Minor	2
Methods Course	3
Major Choral Ensemble	3
Music History 770, 771, 772	12
Social Studies elective	7
	51

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
Social Studies elective	4
H&PE Activities	3
	48

Total 199

NON-PIANO CONCENTRATION

FIRST YEAR	Hrs.
Composition 504, 505, 506*	6
Theory 570, 571, 572	12

*See Musical Proficiency, p. 214.

Keyboard Musicianship I	3
Applied Music 501, 502, 503	6
Music Methods	9
Major Ensémble	3
Communication	8
H&PE Activity	1
Social Studies elective	3
	51

SECOND YEAR	Hrs.
Composition 604, 605, 606	6
Theory 610, 611, 612	12
Keyboard Musicianship II	3
Applied Music 601, 602, 603	3
Applied elective	4
Major Choral Ensemble	3
Music History 770, 771, 772	12
H&PE Activities	2
H&PE 590	3
	48

THIRD YEAR	Hrs.
Composition 704, 705, 706	12
Piano 701, 702, 703	6
Theory 750, 753	7
Conducting	3
Music electives	6
Ensembles	3
Social Studies electives	12
	49

FOURTH YEAR	Hrs.
Composition 804, 805, 806	12
Piano 801, 802, 803	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
	48

Total 196

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 his responsibility to fulfill the requirements of that state in his 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	3
Theory 570, 571, 572	12
Major Ensemble	3
Communication	8
Education 501	3
Music Methods*	9
H&PE 590	3
	53

SECOND YEAR	Hrs.
Instrument 604, 605, 606	12
Keyboard Musicianship II	3
Theory 610, 611, 612	12
Music History 770, 771, 772	12
Major Ensemble	3
Mathematics elective	4
H&PE Activities	3
Psychology 501	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
Science 608 Sound	4
Education 704	3
Philosophy elective	4
	53

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	9
	51

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	3
Theory 570, 571, 572	12
Major Ensemble	3
Communication	8

*Brass and string majors must take the appropriate pedagogy course.

Education 501	3
Music Methods	9
	50

SECOND YEAR	Hrs.
Voice 604, 605, 606	12
Keyboard Musicianship II	3
Theory 610, 611, 612	12
Music History 770, 771, 772	12
Major Ensemble	3
Mathematics elective	4
Psychology 501	3
Physics 608 Sound	4
	53

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	4
Education 704, 706	6
Education 708, 709	8
	50

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	9
H&PE 590 and Activities	6
	53
Total	206

Curriculum for the Degree of Bachelor of Music with the Major in Music Education: Piano or Organ

FIRST YEAR	Hrs.
Instrument 504, 505, 506	12
Theory 570, 571, 572	12
Voice 501, 502, 503*	6
Keyboard Musicianship 590, 591, 592	3
Communication	8
Music Methods	6
H&PE 590	3
	50

SECOND YEAR	Hrs.
Instrument 604, 605, 606	12
Theory 610, 611, 612	12
Accompanying 690, 691, 692	3
Major Ensemble	3
Mathematics elective	4
Psychology 501	3
Psychology 709	4
Social Studies elective	3
Education 501, 704	6
	50

THIRD YEAR	Hrs.
Instrument 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.
Instrument 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
Social Studies electives	6
	52
Total	205-206

*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
Communication	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 elective	3
H&PE Activities	3
Physics 608 Sound	4
Social Studies electives	8
Electives	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
Electives (700- or 800-level)	27
	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	8
English elective	3
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 Activities	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
Electives (700 or 800 level)	20
	39-51

Total 186-198

Bachelor of Music with Major in Music Theory

FIRST YEAR	Hrs.
Instrument Minor 501, 502, 503	6
Theory 570, 571, 572	12
Ensemble	3
Music electives	6
Communication	8
H&PE 590	3
Social Studies electives	8
	46

SECOND YEAR	Hrs.
Instrument Minor 601, 602, 603	6
Theory 610, 611, 612	12
Music History 770, 771, 772	12
English 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
Electives (700- or 800-level)	33
Science elective	4
	52

Total 186-198

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		

Technical and Community College

Nicholas Paraska, Dean

ORGANIZATION AND DEGREES

OBJECTIVES

It is the aim of the Technical and Community College to further the Youngstown State University objective of making higher education available by:

1. providing technical education to meet the needs of the area through a variety of two-year programs and higher degree programs in those areas where duplicate programs are not available elsewhere in the University;

2. providing certain developmental programs through specialized courses not available in any other departments in the University and through comprehensive advisement service.

The Technical and Community College has seven departments: Business Education and Secretarial Studies, Business Technology, Criminal Justice, Engineering Technology, Home Economics, Nursing, and Special Studies.

Two-year programs are offered: in associate in arts leading to the degree of Associate in Arts; in accounting technology, advertising technology, business management technology, commercial art technology, general administration technology, marketing technology, medical secretary, public administration technology, real estate technology, secretarial studies, and transportation management technology leading to the degree of Associate in Applied Business; and in child care technology, civil engineering technology, computer technology, dietary technology, electrical engineering technology, mechanical engineering technology, metallurgical engineering technology, nursing, and police science technology leading to the degree of Associate in Applied Science.

Courses are offered leading to the Bachelor of Science in Applied Science degree with majors in civil engineering technology, corrections, electrical engineering technology, food and nutrition, home economics, law enforcement administration, mechanical engineering technology, and nursing. Also, in cooperation with the School of Education, programs are available leading to the Bachelor of Science in Education degree with majors in business education and home economics. Students may earn the Bachelor of Science in Business Administration degree with a major in secretarial studies through the School of Business Administration.

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).

ROTC students are allowed certain modifications of the requirement, as explained in the General Requirements and Regulations section.

It is the student's responsibility to satisfy all the graduation requirements for the degree he seeks. 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. The exact course requirements are given in the curriculum for each program.

COURSES OF INSTRUCTION AND CURRICULUMS†

BUSINESS EDUCATION AND SECRETARIAL STUDIES

Assistant Professors Phillips (chairman), Boggess, Freeman, and Hille; Instructors Owens, Potts, Sebestyen, and Walton.

The courses in business education and secretarial studies are designed for students interested in secretarial positions and more advanced types of office work, and for education students with a teaching field in business education.

The student working toward the Associate in Applied Business degree with a major in secretarial studies should complete the suggested curriculum (listed after course descriptions), electing to concentrate in a specialized area. (Courses for a concentration for legal secretary are shown later.)

The student may choose to specialize in the executive, technical, legal, or medical area. The student gains experience in the specialized area by taking BE&SS 622 and BE&SS 731 concurrently in an area of specialization.

The student working toward the Associate in Applied Business degree with a major in medical secretary should complete the curriculum (shown later). This is offered for those students who desire to pursue a career in the field of medicine.

For those students desiring to work in a law office or some affiliated profession, a legal secretary curriculum is also available. (Refer to the legal secretary curriculum for specific courses.)

After completing the two-year program, a student who wishes to complete a four-year program may complete the requirements for a bachelor's degree in business education or business administration. Candidates for the Bachelor of Science in Education degree should consult the School of Education section of the catalog. Candidates for the Bachelor of Science in Business Administration degree, with a major in secretarial

†The student should familiarize himself 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.

studies, should consult the School of Business Administration section.

Curriculum sheets for each area may be obtained from the Business Education and Secretarial Studies Office or from advisors.

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 two hours to degree requirements. (F, Sp) 2 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.: BE & SS 520 or equivalent. (F, W, Sp) 4 q.h.

520. *Typewriting I.* The basic principles of touch typewriting. (Students who take this course must add two quarter hours to degree requirements.) Five hours laboratory. (F, W, Sp, Su) 2 q.h.

521. *Typewriting II.* Business letters, outlines, manuscript writing, technical papers, and business reports. Five hours laboratory. Prereq.: BE & SS 520 or equivalent. (F, W, Sp) 2 q.h.

522. *Typewriting III.* Tables, business forms, and executive communications. Five hours laboratory. Prereq.: BE & SS 521 or equivalent. (F, W, Sp) 2 q.h.

530. *Shorthand I.* The fundamental principles of the Gregg system of shorthand are presented. (Students who take this course must add four quarter hours to degree requirements.) (F, W, Sp) 4 q.h.

532. *Machine Shorthand.* Learning the theory of machine shorthand. Students taking 532 must add four hours to degree requirements. (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.: BE&SS 520 or equivalent. (F) 4 q.h.

617. *Business Machines I.* The operation of typical calculators with application to business problems. (F, W, Sp) 3 q.h.

618. *Business Machines II.* Building of skill in the operation of special typewriters, and transcribing, duplicating, and bookkeeping machines. Prereq.: BE & SS 522. (F, W, Sp) 3 q.h.

620. *Typewriting IV.* Advanced typing in professional offices. Five hours laboratory. Prereq.: BE & SS 522. (F, W, Sp) 2 q.h.

621. *Typewriting V.* Specialized typewriting in the technical, medical, legal, or executive office. Five hours laboratory. Prereq.: BE & SS 620. (F, W, Sp) 2 q.h.

622. *Typewriting VI.* Advanced specialized typewriting in the technical, medical, legal, or executive office. Five hours laboratory. Prereq.: BE & SS 621. (F, W, Sp) 2 q.h.

630. *Shorthand II.* Beginning transcription and dictation. A dictation speed of 70 words a minute should be attained. Four hours laboratory. Prereq.: BE & SS 521 and 530, or equivalent. (F, W, Sp) 4 q.h.

631. *Shorthand III.* Emphasis on dictation speed and transcription. A dictation speed of 90 words a minute should be attained. Four hours laboratory. Prereq.: BE & SS 630 or equivalent. (F, W, Sp) 4 q.h.

632. *Machine Shorthand.* Learning the theory of machine shorthand and developing a speed of approximately 60 words a minute on practiced material. Prereq.: BE&SS 521. 4 q.h.

633. *Machine Shorthand.* Develops speed of taking dictation, reviews theory, and develops the ability to transcribe from notes. Prereq.: BE&SS 521. 4 q.h.

Upper Division Courses

704. *Business Communication.* 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.: BE&SS 521 or equivalent. (F, W, Sp) 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. (F, W, Sp) 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.

717. *Comprehensive Business Machines.* Designed to provide the student with a working knowledge of typical office machines with emphasis on the uses of these machines and teaching techniques. For business education students only. Prereq.: BE & SS 522. (F, W, Sp) 3 q.h.

718. *Word Processing.* Students are introduced to word processing through three phases—orientation, skill building, and actual simulation. In skill building, students receive intensive work on word processing equipment in order to meet today's office productivity requirements. In simulation, the class is actually organized into a word processing center of a company and each student becomes a working employee of the center. Prereq.: BE&SS 618 or 717. (F, Sp) 4 q.h.

720. *Personal Relations in Business.* A study of the secretary in business; her effectiveness as related to her personality and to her concept of the fundamental purposes of business. Prereq.: Sophomore standing or permission. (F, W, Sp) 4 q.h.

730. *Shorthand IV.* Emphasis on dictation speed and transcription and refinement of transcription skills. A speed of 110 words a minute should be attained. Four hours laboratory. Prereq.: BE & SS 621 and 631 or equivalent. (F, W, Sp) 4 q.h.

731. *Specialized Dictation.* Dictation and transcription in specialized fields: law, medicine, etc. Includes machine transcription. Four hours lecture, four hours laboratory. Prereq.: BE & SS 618 and 621. (F, W, Sp) 4 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.: BE & SS 618 and 620. (W, Sp) 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 BE&SS 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, BE&SS 621 and 730. (W) 2 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 (Su) 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 subareas, 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.

CURRICULUMS

SECRETARIAL STUDIES CURRICULUM

FIRST YEAR	Hrs.
English 550-551	8
BE & SS 510 Office Procedures	4
BE & SS 521, 522 Typewriting	4
Math. 531 Mathematics of Business	5
BE&SS Shorthand	8
BE & SS 617 Business Machines	3
Social Science 501, 502, 503*	9
Health and Physical Education 590 Health Education	3
Psychology 501 General Psychology	3
	51

*Students may substitute other social studies with advisor's approval.

SECOND YEAR	Hrs.
BE & SS 704 Business Communications	4
Acctg. 605 Elementary Acctg. I**	5
BE & SS 730, 731 Shorthand***	8
BE & SS 805 Office Practicum***	4
BE & SS 706 Business Law	4
BE & SS 618 Business Machines	3
BE & SS 710 Data Processing	3
BE & SS 718 Word Processing	4
BE & SS 720 Personal Relations	4
BE & SS 620, 621, 622 Typewriting***	6
Elective	1
	46
Total Credit Hours	97

MEDICAL SECRETARY CURRICULUM

FIRST YEAR

FIRST QUARTER	Hrs.
English 550 Basic Composition I	4
BE & SS 510 Office Procedures	4
BE & SS 522 Typing III	2
BE & SS 630 Shorthand II	4
Health & Physical Education 590 Health	3
	17

SECOND QUARTER	Hrs.
English 551 Basic Composition II	4
Chemistry 501 Survey I	4
Psych. 501 Introduction	3
BE & SS 620 Typing IV	2
BE & SS 631 Shorthand III	4
	17

THIRD QUARTER	Hrs.
Non-Technical elective	4
Biology 551 Anatomy & Physiology	4
BE & SS 621 Typing V	2
Health & Physical Education 601 First Aid	3
Elective	3
	16

SECOND YEAR

FOURTH QUARTER	Hrs.
Soc. Sci. 501 Introduction	3
Biology 552 Anatomy & Physiology	4
BE & SS 622 Typing VI	2
BE & SS 706 Business Law	4
BE & SS 731 Specialized Dictation	4
	17

**Students who plan to complete a four-year program should add Acctg. 606 and H&PE activities.

***BE&SS 622, 731 and 805 should be taken concurrently in area of specialization.

FIFTH QUARTER	Hrs.
Soc. Sci. 502 Introduction to Economics	3
BE & SS 704 Business Communications	4
Acctg. 605 Accounting I	5
Nursing 501 Introduction	5
	17

SIXTH QUARTER	Hrs.
BE & SS 618 Business Machines II	3
BE & SS 720 Personal Relations in Business	4
BE & SS 710 Introduction to Data Processing	3
BE & SS 805 Office Practicum	4
	14
Total Credit Hours	98

LEGAL SECRETARY CONCENTRATION

FIRST YEAR

	Hrs.
Non-Technical elective	4
Engl. 550 Basic Composition	4
BE & SS 510 Office Procedures	4
BE & SS 521, 522, 620 Typewriting	6
BE & SS 532, 632 Machine Shorthand*	8
BE & SS 618 Business Machines II	3
H&PE 590 Health Education	3
Acctg. 605 Elementary I	5
Social Science 501, 503	6
Criminal Justice 619 Criminal Law	4
Political Science elective	3
	50

SECOND YEAR	Hrs.
BE & SS 621, 622 Typewriting	4
BE & SS 633, 731 Shorthand*	8
BE & SS 704 Business Communications	4
BE & SS 706 Business Law	4
BE & SS 718 Word Processing	4
BE & SS 720 Personal Relations	4
BE & SS 805 Office Practicum	4
Acctg. 606 Elementary II	5
Psych. 501 Introduction	3
Spch. 652 Business & Professional	3
Criminal Justice elective	4
Elective	3
	50
Total Credit Hours	100

BUSINESS TECHNOLOGY

Assistant Professor Hille (acting chairman).

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,

*Gregg shorthand may be substituted.

societal, and environmental factors related to overall operational success.
(F, W, Sp) 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 only) 4 q.h.

510. *Survey of Real Estate Principles.* A survey course 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, etc.—all background knowledge necessary to pass the Ohio license law.
3 q.h.

603. *Introduction to Real Estate Practices.* Basic introduction to real estate practices, organizational operations, ethics, civic responsibilities, marketing functions, and economic impact. 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.* An extension and application of the topics considered in Business Technology 604. Specific applications will be to residential and commercial real estate sales and brokerage operations. Prereq.: Bus. Tech. 604. 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. Prereq.: Permission by chairman. 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.: Bus. Tech. 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. (Special Studies 501 & 502 may also be required.)

ACCOUNTING TECHNOLOGY

FIRST YEAR

FIRST QUARTER	Hrs.
English 550 Basic Composition I	4
Bus. Tech. 500 Survey of American Business (OR) Mgt. 511 Introduction to Business	4-3
Soc. Sci. 501 Introduction to Social Science	3
Health and Physical Education 590 Health Education	3
	13-14

SECOND QUARTER	Hrs.
Non-Technical elective	4
Soc. Sci. 502 Introduction to Economics	3
Psych. 501 Introduction to Psychology	3
Math. 502 Algebra II (OR) Math. 542 Special Topics of Algebra (Math. 531)	5
	15

THIRD QUARTER	Hrs.
Econ. 520 Principles of Economics I	3
Acctg. 605 Elementary Accounting I	5
Soc. Sci. 503 Introduction to Political Science	3
Mktg. 624 Fundamentals of Marketing	5
	16

FOURTH QUARTER	Hrs.
Acctg. 606 Elementary Accounting II	5
Econ. 621 Principles of Economics II	3
CPT 607 Business Programming I	4
	12

SECOND YEAR

FIFTH QUARTER	Hrs.
Econ. 622 Principles of Economics III	3
Mgt. 712 Business Letters (OR) BE&SS 704 Business Communications	3 4
Mgt. 715 Business Law I	4

Acctg. 701 Intermediate Accounting I	5
(BE & SS 710 Introduction to Data Processing—4 hrs.)	
	15-16

SIXTH QUARTER	Hrs.
Acctg. 702 Intermediate Accounting II	5
Fin. 720 Business Finance	4
Mgt. 725 Fundamentals of Management	4
	13

SEVENTH QUARTER	Hrs.
Acctg. 713 Basic Cost Accounting	5
Acctg. 813 Federal Tax Theory	4
Electives (Acctg.)	4
Electives (Bus. Adm.)	3
	16

Total Credit Hours 101-102

ADVERTISING TECHNOLOGY

FIRST YEAR

FIRST QUARTER	Hrs.
English 550 Basic Composition I	4
Bus. Tech. 500 Survey of American Business	4
Art 510 Color and Design	4
	12

SECOND QUARTER	Hrs.
Non-Technical elective	4
Soc. Sci. 501 Introduction to Social Science	3
Adver. 631 Advertising Fundamentals	4
Health and Physical Education 590 Health Education	3
	14

THIRD QUARTER	Hrs.
Adver. 632 Advertising Procedures	4
Soc. Sci. 502 Introduction to Economics	3
Math. 502 Algebra II (OR)	
Math. 531 Mathematics of Business (OR)	
Math. 542 Special Topics of Algebra	5
Psych. 501 Introduction to Psychology	3
	15

FOURTH QUARTER	Hrs.
Mktg. 624 Fundamentals of Marketing	5
Soc. Sci. 503 Introduction to Political Science	3
Speech 652 Business and Professional Speech	3
Mktg. 625 Salesmanship	3
	14

SECOND YEAR

FIFTH QUARTER	Hrs.
P.R. 710 Basic Public Relations	3
Adver. 725 Advertising Copywriting	4
Econ. 520 Principles of Economics I	3
Elective (Bus. Adm.) OR	3
BE&SS 704 Business Communications	4
Art 623 Advertising Art	3
	16-17

SIXTH QUARTER	Hrs.
Adver. 727 Advertising Layout	4
P.R. 754 Media Presentation	4
Econ. 621 Principles of Economics II	3
Art 624 Advertising Art II	3
	14

SEVENTH QUARTER	Hrs.
Econ. 622 Principles of Economics III	3
Adver. 811 Direct Mail Advertising (OR)	
Adver. 815 Radio and Television Advertising	3
Mgt. 715 Business Law I	4
Acctg. 605 Elementary Accounting I	5
	15

Total Credit Hours 102-103

BUSINESS MANAGEMENT TECHNOLOGY

FIRST YEAR

FIRST QUARTER	Hrs.
English 550 Basic Composition I	4
Bus. Tech. 500 Survey of American Business (OR)	
Mgt. 511 Introduction to Business	4-3
Math. 502 Algebra II (OR)	
Math. 542 Special Topics of Algebra	5
Soc. Sci. 501 Introduction to Social Science	3
	15-16

SECOND QUARTER	Hrs.
Non-Technical elective	4
Psych. 501 Introduction to Psychology	3
Mktg. 624 Fundamentals of Marketing	5
Soc. Sci. 502 Introduction to Economics	3
	15

THIRD QUARTER	Hrs.
Acctg. 605 Elementary Accounting I	5
Econ. 520 Principles of Economics I	3
Soc. Sci. 503 Introduction to Political Science	3
Speech 652 Business and Professional Speech	3
	14

FOURTH QUARTER	Hrs.
Econ. 621 Principles of Economics II	3
Health and Physical Education 590 Health Education	3
Mgt. 713 Report Writing (OR)	3
BE & SS 704 Bus. Communications	4
Acctg. 606 Elementary Accounting II	5
	14-15

SECOND YEAR

FIFTH QUARTER	Hrs.
Econ. 622 Principles of Economics III	3
Mgt. 715 Business Law I	4
Mktg. 720 Industrial Marketing	3
Acctg. 713 Basic Cost Accounting	5
	15

SIXTH QUARTER	Hrs.
Econ. 704 Economics and Social Statistics I	4
Fin. 720 Business Finance	4
Mgt. 725 Fundamentals of Management	4
	12

SEVENTH QUARTER	Hrs.
Mgt. 705 Principles of Transportation	4
Fin. 722 Insurance Fundamentals (OR) Fin. 730 Investment Analysis	3
Elective (Mgt.)	3
Mgt. 750 Human Behavior in Organization	4
	14

Total Credit Hours 100-101

COMMERCIAL ART TECHNOLOGY

FIRST YEAR

FIRST QUARTER	Hrs.
English 550 Basic Composition I	4
Art 510 Color and Design	4
Art 601 Drawing	3
Soc. Sci. 501 Introduction to Social Science	3
	14

SECOND QUARTER	Hrs.
Non-Technical elective	4
Art 602 Drawing Techniques	3
Psych. 501 Introduction to Psychology	3
Art 623 Advertising Art I	3
Soc. Sci. 502 Introduction to Economics	3
	16

THIRD QUARTER	Hrs.
Adver. 631 Advertising Fundamentals	4
Art 611 Printmaking I	4
Art 624 Advertising Art II	3
Soc. Sci. 503 Introduction to Political Science	3
	14

FOURTH QUARTER	Hrs.
Art 705 Advanced Drawing	3
Art 625 Advertising Art III	3
Adver. 632 Advertising Procedures	4
Math. 502 Algebra II (OR) Math. 531 Mathematics of Business	5
	15

SECOND YEAR

FIFTH QUARTER	Hrs.
Art 727 Advanced Advertising Art I	3
Adver. 725 Advertising Copywriting	4
Mktg. 624 Fundamentals of Marketing	5
	12

SIXTH QUARTER	Hrs.
Art 728 Advanced Advertising Art II	3
Art 716 Interior Design	3
Art 780 Photography I	4
Mktg. 625 Salesmanship	3
	13

SEVENTH QUARTER	Hrs.
Art 729 Advanced Advertising Art III	3
Adver. 727 Advertising Layout	4
Health and Physical Education 590 Health Education	3
Elective (Non-Technical)	4
	14

Total Credit Hours 98

GENERAL ADMINISTRATION TECHNOLOGY

FIRST YEAR

FIRST QUARTER	Hrs.
English 550 Basic Composition I	4
Bus. Tech. 501 Introduction to Transportation (OR) Bus. Tech. 500 Survey of American Business (OR) Mgt. 511 Introduction to Business	4-3
Soc. Sci. 501 Introduction to Social Science	3
Health and Physical Education 590 Health Education	3
	13-14

SECOND QUARTER	Hrs.
Non-Technical elective	4
Soc. Sci. 502 Introduction to Economics	3
Psych. 501 Introduction to Psychology	3
Geog. 519 Economic Geography	4
	14

THIRD QUARTER	Hrs.
Math. 502 Algebra II (OR) Math. 531 Mathematics of Business (OR) Math. 542 Special Topics of Algebra	5
Mktg. 624 Fundamentals of Marketing	5
Soc. Sci. 503 Introduction to Political Science	3
Speech 652 Business and Professional Speech	3
	16

FOURTH QUARTER	Hrs.
Mktg. 625 Salesmanship	3
Mgt. 712 Business Letters (OR)	

BE & SS 704 Business Communications	4
Econ. 520 Principles of Economics I	3
	9-10

SECOND YEAR

FIFTH QUARTER	Hrs.
Acctg. 605 Elementary Accounting I	5
Mgt. 715 Business Law I	4
Econ. 621 Principles of Economics II	3
Mgt. 740 Office Management and Methods	3
	15

SIXTH QUARTER	Hrs.
Acctg. 606 Elementary Accounting II	5
Mgt. 725 Fundamentals of Management	4
Econ. 622 Principles of Economics III	3
Electives (Bus. Adm.)	3
	15

SEVENTH QUARTER	Hrs.
Fin. 720 Business Finance	4
Fin. 722 Insurance Fundamentals (OR) Fin. 724 Credit Management	3
Mgt. 750 Human Behavior in Organization	4
Electives (Bus. Adm.)	3
	14

Total Credit Hours 97-98

MARKETING TECHNOLOGY

FIRST YEAR

FIRST QUARTER	Hrs.
English 550 Basic Composition I	4
Bus. Tech. 501 Introduction to Transportation (OR) Bus. Tech. 500 Survey of American Business (OR) Mgt. 511 Introduction to Business	4-3
Math. 502 Algebra II (OR) Math. 531 Mathematics of Business (OR) Math. 542 Special Topics of Algebra	5
	12-13

SECOND QUARTER	Hrs.
Non-Technical elective	4
Soc. Sci. 501 Introduction to Social Science	3
Geog. 519 Economic Geography	4
Health and Physical Education 590 Health Education	3
	14

THIRD QUARTER	Hrs.
Speech 652 Business and Professional Speech	3
Soc. Sci. 502 Introduction to Economics	3
Psych. 501 Introduction to Psychology	3
Mktg. 624 Fundamentals of Marketing	5
	14

FOURTH QUARTER	Hrs.
Adver. 631 Advertising Fundamentals	4
Econ. 520 Principles of Economics I	3
Mktg. 625 Salesmanship	3
Soc. Sci. 503 Introduction to Political Science	3
	13

SECOND YEAR

FIFTH QUARTER	Hrs.
Acctg. 605 Elementary Accounting I	5
Econ. 621 Principles of Economics II	3
Adver. 632 Advertising Procedures	4
Bus. Tech. 635 Visual Presentation (OR) Electives (Mktg.)	3
	15

(Elective in Marketing—6 hrs.)

SIXTH QUARTER	Hrs.
Acctg. 606 Elementary Accounting II	5
Econ. 622 Principles of Economics III	3
Mgt. 715 Business Law I	4
	12

SEVENTH QUARTER	Hrs.
Mktg. 709 Retail Marketing (OR) Mktg. 720 Industrial Marketing	3
Mktg. 713 Retail Buying	4
Mktg. 726 Effective Motivation	3
Mktg. 731 Non-Textiles (OR) Mktg. 733 Furnishings	3
BE&SS 704 Business Communications (OR)	4
Elective (Mktg.)	3
	16-17

Total Credit Hours 96-98

PUBLIC ADMINISTRATION TECHNOLOGY

FIRST YEAR

FIRST QUARTER	Hrs.
English 550 Basic Composition I	4
Bus. Tech. 500 Survey of American Business (OR) Mgt. 511 Introduction to Business	4-3
Math. 502 Algebra II (OR) Math. 531 Mathematics of Business (OR) Math. 542 Special Topics of Algebra	5
Soc. Sci. 501 Introduction to Social Science	3
	15-16

SECOND QUARTER	Hrs.
Non-Technical elective	4
Soc. Sci. 502 Introduction to Economics	3
Psych. 501 Introduction to Psychology	3
Geog. 519 Economic Geography	4
	14

THIRD QUARTER	Hrs.
Speech 652 Business and Professional Speech	3
Soc. Sci. 503 Introduction to Political Science	3
Mktg. 624 Fundamentals of Marketing	5
Econ. 520 Principles of Economics I	3
	14

FOURTH QUARTER	Hrs.
Econ. 621 Principles of Economics II	3
Pol. Sci. 600 Elements of Politics	3
Health and Physical Education 590 Health Education	3
Pol. Sci. 601 American National Government	4
	13

SECOND YEAR

FIFTH QUARTER	Hrs.
Acctg. 605 Elementary Accounting I	5
Econ. 622 Principles of Economics III	3
Pol. Sci. 704 American Political Parties	3
Pol. Sci. 722 State and Local Government	3
	14

SIXTH QUARTER	Hrs.
Acctg. 606 Elementary Accounting II	5
Mgt. 725 Fundamentals of Management	4
Mgt. 715 Business Law I	4
	13

SEVENTH QUARTER	Hrs.
Fin. 720 Business Finance	4
Mgt. 750 Human Behavior in Organization	4
Pol. Sci. 720 Public Administration	3
Pol. Sci. 721 Urban Government	3
	14

Total Credit Hours 97-98

REAL ESTATE TECHNOLOGY

FIRST YEAR

FIRST QUARTER	Hrs.
English 550 Basic Composition I	4
Bus. Tech. 510 Survey of Real Estate Principles	3
Math. 531 Mathematics of Business	5
Bus. Tech. 610 Real Estate Law	3
	15

SECOND QUARTER	Hrs.
Non-Technical elective	4
Bus. Tech. 603 Introduction to Real Estate	3
Soc. Sci. 501 Introduction to Social Science (OR) Soc. Studies elective	3
Psych. 501 Introduction to Psychology	3
	13

THIRD QUARTER	Hrs.
Bus. Tech. 604 Real Estate Appraisal I	3
Mktg. 624 Marketing	5
Speech 652 Business and Professional Speech	3
Soc. Sci. 502 Introduction to Economics (OR) Soc. Studies elective	3
	14

FOURTH QUARTER	Hrs.
Soc. Sci. 503 Introduction to Political Science (OR) Social Studies elective	3
Econ. 520 Principles of Economics I	3
Bus. Tech. 605 Real Estate Appraisal II	3
Mktg. 625 Salesmanship	3
	11

SECOND YEAR

FIFTH QUARTER	Hrs.
Acctg. 605 Accounting I	5
Econ. 621 Principles of Economics II	3
BE & SS 704 Business Communications	4
Mgt. 715 Business Law I	4
	16

SIXTH QUARTER	Hrs.
Acctg. 606 Accounting II	5
Fin. 722 Insurance (OR) Fin. 720 Business Finance	3-4
Fin. 717 Principles of Real Estate	3
H&PE 590 Health Education	3
	14-15

SEVENTH QUARTER	Hrs.
Fin. 718 Real Estate Finance and Problems	3
Mgt. 725 Fundamentals of Management	4
Adv. 631 Advertising Fundamentals	4
Bus. Tech. 620 Special Topics in Real Estate	3
	14

Total Credit Hours 97-98

TRANSPORTATION MANAGEMENT TECHNOLOGY

FIRST YEAR

FIRST QUARTER	Hrs.
English 550 Basic Composition I	4
Mgt. 605 Transportation Rates	3
Math. 502 Algebra II (OR) Math. 542 Special Topics of Algebra (Math. 531 Business Math—5)	5
Soc. Sci. 501 Introduction to Social Science	3
	15

SECOND QUARTER	Hrs.
Non-Technical elective	4
Econ. 520 Principles of Economics I	3
Bus. Tech. 501 Introduction to Transportation	4
Psych. 501 Introduction to Psychology	3
	14

THIRD QUARTER	Hrs.
Speech 652 Business and Professional Speech	3
Soc. Sci. 503 Introduction to Political Science	3
Mgt. 606 Transportation Rates II	3
Health and Physical Education 590 Health Education	3
Econ. 621 Principles of Economics II	3
	15

FOURTH QUARTER	Hrs.
Acctg. 605 Elementary Accounting I	5
Mktg. 624 Fundamentals of Marketing	5
Econ. 622 Principles of Economics III	3
	13

FIFTH QUARTER	Hrs.
Acctg. 606 Elementary Accounting II	5
Mgt. 715 Business Law I	4
BE & SS 704 Business Communications (OR)	4
Mgt. 712 Business Letters	3
Geog. 519 Economic Geography	4
	16-17

SIXTH QUARTER	Hrs.
Mgt. 705 Principles of Transportation	4
Mgt. 725 Fundamentals of Management	5
Econ. 704 Economics and Social Statistics I	4
	13

SEVENTH QUARTER	Hrs.
Mgt. 707 Commercial Motor Transportation	5
Mgt. 746 Industrial Traffic Management	3
Mgt. 750 Human Behavior in Organization	4
Elective (Bus. Adm.)	3
	15

Total Credit Hours 100

Suggested electives in the School of Business Administration that may be taken by any business technology major in consultation with his advisor: Acctg. 701, 702, 721, and 810; Fin. 717, 720, 724; Mgt. 705, 712, 716, 750, 804; Pub. Rel. 754, 755, 757, 810; BE&SS 520, 521, 617, 704. Letter grade of *C* or better required in major area of concentration for graduation.

CRIMINAL JUSTICE

Associate Professors J. D. Foster (chairman), Davies, DeGarmo, Sumpter, and Venters; Assistant Professors Collins, Feigenbaum, Lateef, Pilcher, and Stanko; Instructor Shidel.

Youngstown State University offers three 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.

ASSOCIATE IN APPLIED SCIENCE DEGREE

The *police science technology* program is considered appropriate training for persons preparing for employment in most municipal, state, private, and some federal law enforcement agencies. The program consists of 93 quarter hours, 45 quarter hours of which are in the subjects listed below as Lower Division courses. Students who have satisfactorily completed the police science technology program may enter a 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 45 quarter hours of criminal justice courses, of which 20 quarter hours or more must be from the Upper Division courses listed below. The students must 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:

Department Core Requirements: 601, 602, 603, and any two of the following: 715, 735, 825, and 836.

Additional courses required for those majoring in law enforcement administration: 613, 613L, 614, 614L, and 619.

Additional courses required for those majoring in corrections: 701, 703, and 707.

Additional courses may be elected by all majors within the department upon approval of the student's advisor.

Lower Division Courses

601. *Law Enforcement.* History and philosophy of civil police powers, description of the civil police system, the constitutional foundation, description of its various programs. (F,W,Sp) 4 q.h.

602. *Criminal Judicial System.* History and philosophy of the criminal judicial system, a description of the system including the juvenile court, the constitutional foundation of its functions and the rights of those confronted by it, a description of its various programs. (F,W,Sp) 4 q.h.

603. *Corrections.* History and philosophy of corrections, a description of the system, the constitutional foundation of its control and the rights of those within it, a description of its various programs. (F,W,Sp) 4 q.h.

605. *Criminal Justice.* An overview of the American criminal justice process with emphasis upon its constitutional foundations, its constitutional limits, and the rights of an individual from arrest through sentencing and release. (F,W,Sp) 4 q.h.

613. *Criminal Investigation.* A general introduction to methods of criminal investigation and crime scene search; interviewing of suspects, victims and witnesses; sources of information; presentation of evidence in court. Prereq.: 10 q.h. criminal justice classes. (F,W,Sp) 4 q.h.

613L. *Criminal Investigation Practicum.* Demonstrations of the use of technical investigative aids, latent print techniques, photography, ballistics, plaster casting, and the polygraph. Prereq.: Must be taken concurrently with 613. (F,W,Sp) 1 q.h.

614. *Criminal Identification.* 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.: 613. (F,W,Sp) 3 q.h.

614L. *Criminal Identification Lab.* Laboratory demonstrations of trace evidence analysis involving body fluids, elementary toxicology, dangerous drugs, hairs and fibers, handwriting, and number restoration. Intended to acquaint students with crime laboratory procedures. Prereq.: Must be taken concurrently with 614. (F,W,Sp) 2 q.h.

619. *Criminal Law.* Development, theories, and purposes of criminal law; elements of a crime, parties to a crime. (F,W,Sp) 4 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.: 619. (F,W,Sp) 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. (F,W,Sp) 4 q.h.

646. *Law Enforcement Techniques.* Practice and theory of the use of selected technical equipment; basic firearms familiarization; non-lethal defensive tactics; case, arrest, and personal identification records; individual report writing; uniform crime reporting. Three lecture hours and 3 laboratory hours per week. Prereq.: 16 q.h. of criminal justice classes. (F,Sp) 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. (F,W,Sp) 4 q.h.

665. *Human Relations in Criminal Justice.* Methods of coping with conflicts arising out of intervention for law violations; improvement of understanding of public reactions to 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. Three hours of lecture and 3 hours of practicum per week. Prereq.: Sociology 600 and Psych. 501 or 601. (F,W,Sp) 4 q.h.

670. *Community Intervention Resources.* Community based resources which are designed to prevent, control, or rehabilitate the delinquent or adult offender. Prereq.: Criminal Justice 630. (F,W,Sp) 4 q.h.

Upper Division Courses

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, chronological recording, report writing and oral presentation of cases. Three hours of lecture and 3 hours of practicum per week. Prereq.: Junior standing. (W) 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. *Social Research.* Identical with Sociology 751. 5 q.h.

715. *Criminal Justice Management Concepts.* An analysis of modern criminal justice management theory; organizational behavior, organization development, personnel management, executive decision making, supervision problems. (F) 4 q.h.

735. *Juvenile Delinquency.* Social and psychological factors underlying delinquency; the juvenile court and probation; treatment and preventive measures. Prereq.: Sociology 600. (F,W,Sp,Su) 4 q.h.

748. *Commercial and Industrial Security.* Plant protection and industrial security; merchandising safety and security; credit and insurance investigative procedures. 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. (F,Sp) 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 5 quarter hours credit. Prereq.: Senior standing, completion of 20 hrs. 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, 736. (Sp) 4 q.h.

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.

836. *Theory of Criminal Behavior.* An analysis of theory and research on epidemiology and etiology of crime. Prereq.: 630. (W) 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.

POLICE SCIENCE TECHNOLOGY CURRICULUM

DEPARTMENTAL REQUIREMENTS	Q.H.
601 Law Enforcement	4
602 Criminal Judicial System	4
603 Corrections	4
613 Criminal Investigation (P)	4
613L Criminal Investigation Prac. (P)	1
614 Criminal Identification (P)	3

614L Criminal Identification Lab (P)	2
619 Criminal Law	4
630 Criminology	4
665 Human Relations in Criminal Justice	4
Any two criminal justice electives	
Minimum Required Hours	45

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:	
BE & SS 520 Typing I	2
Electives	13

ENGINEERING TECHNOLOGY

Professor Richley (chairman); Associate Professor Crum; Assistant Professors Barsch, Chrobak, Gardner, and Herndon.

The Engineering Technology Department offers technical education programs in both engineering technology and computer technology. The programs include both classroom and laboratory experiences which stress the application of established engineering and computer knowledge and methods to the solution of practical problems in a technology. 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
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 engineering or computer 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.

BACHELOR OF SCIENCE IN APPLIED SCIENCE DEGREE

The civil, 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 his needs. After completing the requirements of the two-year associate degree, the student may elect to enter industry as an engineering technician, or through an added two years of part-time or full-time study, earn the degree Bachelor of Science in Applied Science. He will then have increased his career potential to that of an engineering technologist.

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 mainte-

nance 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.

Prospective engineering technology students are urged to enroll in the following 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. The course 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 technicians.

(F,W,Sp) 4 q.h.

CIVIL ENGINEERING TECHNOLOGY

Associate Professor Crum (supervisor).

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.

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.

ASSOCIATE DEGREE PROGRAM

FIRST YEAR

FIRST QUARTER	Hrs.
Math. 502 Algebra II	5
Physics	4
ET 505 Elements Engr. Technology	4
Chem. 501 Survey of Chemistry	4
	17

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
Social Studies elective*	3
MET 516 Mechanics II	4
CET 604 Properties and Strength of Materials	4
	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.
Soc. Sci. 502 Intro. to Econ.	3
CET 610 Structural Analysis	4
CET 615 Soil Mechanics	4
Speech 652 Business and Professional Speech	3
H&PE 590 Health Education	3
	17

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	98

BACHELOR'S DEGREE PROGRAM

The bachelor's program in civil technology allows a student to increase his potential to that of an engineering technologist and broaden in several technical and non-technical areas. He can, as well, concentrate in urban planning, architecture, and construction, or transportation as his interests dictate. The program is regionally accredited and therefore is applicable towards the total academic and experience requirements for certification.

THIRD YEAR

SEVENTH QUARTER	Hrs.
English 551 Basic Comp. II	4

*Social Studies elective—Select one course maximum from any two of: geography, history, political science, psychology, sociology or social science.

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. 704 Economics and 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
Mgt. 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
Mgt. 715 Business Law	4
Elective	4
Geog. 808 Land Use & Transportation	4
	16

TWELFTH QUARTER	Hrs.
Humanities elective	4
Mgt. 717 Real Estate Principles or Geog. 809 City & Regional Plan.	4
Elective	4
CET 817 Construction Management	4
	16

Total Credit Hours 196

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.: Chem. 501, MET 516 (or concurrently). (F,Sp) 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.: 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 such as water supply, waste management, utility services, land planning, and traffic control. Emphasis is placed on development of the ability to apply mechanics, graphics, and measurements skills to problems in the aforementioned areas. Prereq.: Chem. 501, CET 615, CE 710. (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.

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.

COMPUTER TECHNOLOGY

Assistant Professors Chrobak (supervisor) and Herndon.

The Computer Technology Program produces a graduate skilled to meet the needs of the electronic data-processing industry. Most graduates are employed as programmers or associate operators in computer centers related to business or science.

ASSOCIATE DEGREE PROGRAM

FIRST YEAR

FIRST QUARTER	Hrs.
Math. 502 Algebra II	5
English 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

*Social Studies elective—Select one course maximum from any two of: geography, history, political science, psychology, sociology or social science.

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

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, 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.

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. (F,W,Sp) 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. Three hours of lecture and three hours of programming laboratory per week. 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 Programming 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. (F,W,Sp) 4 q.h.

608. *Business Programming II.* The application of COBOL to the solution of advanced problems in business. Techniques of programming using mass storage devices. Three hours of lecture and three hours of programming laboratory per week. Prereq.: CPT 607 or consent of instructor. (F) 4 q.h.

611. *Programming-S/360 Assembler.* This course includes the use of the assembler language developed for this computer and the writing, testing, and running of programs on this computer. Three hours lecture and three hours of laboratory per week. Prereq.: CPT 607. (W) 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. Three hours lecture and three hours laboratory per week. Prereq.: CPT 607 or consent of instructor. (F) 4 q.h.

614. *Business Systems and Procedures.* Study of methods of analysis 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. Three hours of lecture and three hours of laboratory per week. 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. 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. 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. 4 q.h.

720. *Telecommunications.* Principles behind the different types of data transission hardware and techniques with communication links in time-sharing and real-time systems. Prereq.: CPT 611 or consent of instructor. 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. Specific problems consisting of error analysis, evaluation of determinants and matrices, and differentiation techniques. Prereq.: CPT 701 or consent of instructor. 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. 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. 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 814. 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. 4 q.h.

ELECTRICAL ENGINEERING TECHNOLOGY

Professor Richley; Assistant Professor Gardner (supervisor).

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 he chooses, to continue for two more years of full-time study, at which time he is awarded the Bachelor of Science in Applied Science degree.

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.

Being accredited by the Engineers' Council for Professional Development, the two-year Electrical Engineering Technology Program automatically qualifies its graduates for immediate certification 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.

ASSOCIATE DEGREE PROGRAM

FIRST YEAR

FIRST QUARTER	Hrs.
Math. 502 Algebra II	5
English 550 Basic Comp. I	4
ME 500 Dwg. Fundamentals	3
ET 505 Elements Engr. Technology	4
	16

SECOND QUARTER	Hrs.
Math. 503 Trigonometry	5
Health and Physical Education 590 Health Education	3
CPT 601 Scientific Prog. I	4
EET 501 Circuit Theory I	3
EET 501L 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

*Social Studies elective—Select one course maximum from any two of: geography, history, political science, psychology, sociology or social science.

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.

THIRD YEAR

SEVENTH QUARTER	Hrs.
English 551 Basic Comp. II	4
Math. 670 Applied Math. II	4
MET 630 Manufacturing Techniques	4
EET 710 Networks	4
H&PE Activity Course	1
	17

EIGHTH QUARTER	Hrs.
Humanities elective	4
Math. 770 Applied Math. III	4
CPT 701 Scientific Prog. Applications	4
EET 720 Pulse Circuit Design	4
	16

NINTH QUARTER	Hrs.
Social Studies elective	3
CET 604 Prop./Stgth. of Matls.	4
MET 700 Physical Measurements	4
EET 730 Logic Systems Design	4
H&PE Activity Course	1
	16

FOURTH YEAR

TENTH QUARTER	Hrs.
Humanities elective (700-level)	4
Mgt. 725 Fundamentals of Management	4
Elective	4
CET 800 Building Systems	4
	16

ELEVENTH QUARTER	Hrs.
Econ. 704 Economics and Social Statistics I	4
Mgt. 819 Production Management	4
Elective	4
EET 810 Electrical Systems Design	4
	16

TWELFTH QUARTER	Hrs.
Social Studies elective (700-level)	4
Mgt. 715 Business Law I	4
Elective	4
EET 820 Power Transmission	4
H&PE Activity Course	1
	17
Total Credit Hours	194

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. Concurrent: Math. 503. (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.* Inductance, capacitance; analysis of simple transient circuits; alternating current and voltage; Phasor algebra; solution of steady state A.C. circuits; network theorems; Phasor diagrams; power, power factor; resonant circuits. Prereq.: EET 501. Concurrent: Math. 570. (F,Sp) 3 q.h.

502L. *Circuit Theory II Laboratory.* Experiments on the measurement of inductance and capacitance; simple transient circuits; measurement of voltage, current, and power in A.C. single phase series and parallel circuits; resonant circuits. Three hours of laboratory per week. Taken concurrently with EET 502. (F,Sp) 1 q.h.

503. *Circuit Theory III.* Graphical analysis of circuits, locus plots; mutually coupled circuits; two-port networks; non-sinusoidal analysis; electric wave filters, polyphase circuits. Prereq.: EET 502, Math. 570. (F,W) 3 q.h.

503L. *Circuit Theory III Laboratory.* Experiments on the measurement of mutual inductance; mutually coupled circuits; two-port parameters; non-sinusoidal waves; filters; three-phase circuits. Three hours of laboratory per week. Taken concurrently with EET 503. (F,W) 1 q.h.

600. *Measurements.* Error and analysis; basic meter in D.C. measurement; basic meter in A.C. measurement; comparison methods; A.C. bridge methods; transducers; instrument transformers, test equipment; cathode ray oscilloscope; magnetic measurements; audio and radio frequency test methods; counting and digital display instruments. Prereq.: EET 502. 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.* Semiconductor principles and the semiconductor diode; thermonic emission and the vacuum diode; rectifiers, power supplies, and filters; vacuum tubes, triode, tetrode, pentode; transistor characteristics and applications. Prereq.: EET 502. Concurrent: EET 503, EET 600. (F) 3 q.h.

605L. *Electronics I Laboratory.* Experiments on vacuum tube characteristics; diode, triode, tetrode, pentode; transistor characteristics; half-wave, full-wave rectifiers. Three hours of laboratory per week. Taken concurrently with EET 605. (F) 1 q.h.

606. *Electronics II.* Analysis of vacuum tube and transistor amplifiers; transformer coupling; R-C coupled amplifiers; power amplifiers; special purpose amplifiers; phase inverters. Prereq.: EET 503, EET 600, EET 605. (W) 3 q.h.

606L. *Electronics II Laboratory.* Experiments on vacuum tube amplifiers; transistor amplifiers; R-C coupled amplifiers; power ampliers; magnetic amplifiers. Three hours of laboratory per week. Taken concurrently with EET 606. (W) 1 q.h.

607. *Electronics III.* Analysis of feedback amplifiers; audio and radio frequency oscillators; amplitude and frequency modulation, demodulation; cathode ray oscilloscope; glow and arc discharge tubes; electronic power conversion; photoelectric devices. Prereq.: EET 606. (Sp) 3 q.h.

607L. *Electronics III Laboratory.* Experiments on feedback amplifiers; oscillators; basic amplitude and frequency modulated transmitter; photoelectric devices; associated circuit devices. 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 503, EET 600. (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; special transformers; alternators; induction motors; synchronous motors; single-phase motors. Prereq.: EET 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; feedback circuits; electronic timers; photoelectric devices; electronic power conversion; motor control; heating system control; servomechanisms. Concurrent: EET 606, EET 610. (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 610. Concurrent: EET 611. (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. 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 810. 4 q.h.

MECHANICAL ENGINEERING TECHNOLOGY

Assistant Professor Barsch (supervisor).

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.

ASSOCIATE DEGREE PROGRAM

FIRST YEAR

FIRST QUARTER	Hrs.
Math. 502 Algebra II	5
Physics	4
ET 505 Elements Engr. Technology	4
Chem. 501 Survey of Chem.	4
	17

SECOND QUARTER	Hrs.
Math. 503 Trigonometry	5
English 550 Basic Comp. I	4
ME 501 Engineering Dwg.	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	4

*Social Studies elective—Select one course maximum from any three of: economics, geography, history, political science, psychology, sociology or social science.

MET 615 Fluid Mechanics	4
CET 607 Solid Mechanics	4
Social Studies elective*	3
	15

FIFTH QUARTER	Hrs.
MET 605 Thermodynamics	4
MET 606 Machine Design I	4
MET 550 Advanced Drawing	4
Social Studies elective*	3
	15

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
Health and Physical Education 590 Health Education	3
	17
Total Credit Hours	96

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 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.

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
EET 501 Circuit Theory I	3
EET 501L Circuit Theory I Lab	1
H&PE Activity Course	1
	17

*Social Studies elective—Select one course maximum from any three of: economics, geography, history, political science, psychology, sociology or social science.

NINTH QUARTER	Hrs.
Econ. 704 Economics and Social Statistics	4
MET 720 Mechanisms	4
MET 700 Physical Measurements	4
Elective	4
H&PE Activity Course	1
	17

FOURTH YEAR

TENTH QUARTER	Hrs.
Social Studies elective (700-level)	4
Mgt. 725 Funds of Management	4
MET 810 Manufacturing Systems Analysis	4
CET 800 Building Systems	4
	16

ELEVENTH QUARTER	Hrs.
Humanities elective	4
Mgt. 819 Production Management	4
MET 820 Machine Systems	4
Elective	4
	16

TWELFTH QUARTER	Hrs.
Humanities elective (700-level)	4
Mgt. 820 Production Control	4
MET 830 Advanced Tool Design	4
Elective (700-level)	4
	16
Total Credit Hours	195

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, internal forces, and fluid statics. 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 and fluids, study of various types of motion, Newton's second law, concept of work and energy, impulse and momentum, vibrations. 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, shafting, and welded connections. Three hours lecture, three hours laboratory per week. Prereq.: 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 refrigerators, pumps, internal combustion engines, and vibration equipment. Prereq.: CET 607, MET 605, MET 615. (Sp) 3 q.h.

610L. *Mechanical Equipment Laboratory.* Laboratory tests and applications of equipment 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.* Manufacturing methods, processes, tooling, and equipment. Topics include casting, machine operations, and machine tools, welding, production machining. Prereq.: CET 604. (F) 4 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. 4 q.h.

720. *Mechanisms.* Graphical, analytical and computer 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, CPT 601. 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.

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 720, EET 501. 4 q.h.

830. *Advanced 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 820, MET 620. 4 q.h.

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.

ASSOCIATE DEGREE PROGRAM

FIRST YEAR

FIRST QUARTER	Hrs.
Math. 502 Algebra II	5
Chem. 501 Survey of Chemistry	4
English 550 Basic Comp. I	4
ET 505 Elements Engr. Technology	4
	17

SECOND QUARTER	Hrs.
Math. 503 Trigonometry	5
Chem. 502 Survey of Chemistry	4
Speech 652 Business and Professional Speech	3
Physics 501 Fund. of Physics	4
	16

THIRD QUARTER	Hrs.
Math. 570 Applied Math I	5
CET 604 Prop./Str. of Mat'l	4
Physics 502 Fund. of Physics	3
Physics 502L Fund. of Physics Laboratory	1
MTT 500 Intro. to Metallurgy	3
	16

SECOND YEAR

FOURTH QUARTER	Hrs.
Social Studies elective*	3
CET 607 Solid Mechanics	4
MTT 604 Physical Met. (Adap. I)	3
MTT 604L Physical Met. (Adap. I) Lab.	1
MTT 501 Foundry and Metal Casting	3
MTT 501L Foundry and Metal Casting Lab.	1
	15

FIFTH QUARTER	Hrs.
Soc. Sci. 502 Intro. to Econ.	3
MTT 606 Physical Met. (Adap. II)	4
MTT 610 Metallurgy of Iron and Stl.	4
CPT 601 Scientific Prog. I	4
	15

SIXTH QUARTER	Hrs.
Social Studies elective*	3
MTT 608 Phys. Met. (Adap. III)	4
MTT 602 Non-Destructive Inspect	3
MTT 602L Non-Des. Inspect Lab.	1
Health and Physical Education 590 Health Education	3
Physics 503 Fund. of Physics	3
Physics 503L Fund. of Physics Lab.	1
	18
Total Credit Hours	97

500. *Introduction to Metallurgy (Extractive).* Principles of mineral beneficiation, pyrometallurgical process for smelting ores and refining crude metal. The functions of fluxes, slags, and refractories in these processes. Prereq.: Chem. 501. (Sp) 3 q.h.

501. *Foundry and Metal Casting.* Mechanism and solidification of metals, stress-strain relations in castings mold materials; reaction at refractory metal interface mold design, optimization of casting design and processing method, mold production, and pattern construction. Prereq.: Chem. 501. (F) 3 q.h.

501L. *Foundry and Metal Casting Laboratory.* Elementary foundry practice; molding simple aluminum, copper, and titanium castings; crucible furnace and induction furnace melting; selection and control of melting process. Three hours of laboratory per week. Taken concurrently with MTT 501. (F) 1 q.h.

602. *Non-Destructive Inspection.* A study of principles and techniques of non-destructive testing with liquid penetrant, ultrasonic, eddy current, magnetic particle for the detection of structural defects in ferrous and non-ferrous and non-metallic materials in cast, weld, and in mechanically deformed conditions. Prereq.: MTT 604, Physics 502. (Sp) 3 q.h.

602L. *Non-Destructive Inspection Laboratory.* Develop techniques of operating tester (magna-glow, portable sonic, spark testing) on metallic specimen with and without structural and internal defects, classification of surface and internal defects on various processed non-ferrous metals. Utilization of spark testing for identification of carbon analysis in ferrous metals including simple alloys. Three hours of laboratory per week. Taken concurrently with MTT 602. (Sp) 1 q.h.

604. *Physical Metallurgy (Mechanical Adaptive I).* Study of crystalline nature of metals (iron and steel), the crystalline nature of mechanical phenomena. Mechanical concepts in deformation, *i.e.,* elastic vs. plastic deformation, strain, yield; failure vs. fracture and hot-working vs. cold-working. Prereq.: MTT 500. (F) 3 q.h.

604L. *Physical Metallurgy (Mechanical Adaptive I Laboratory).* Preparation of test specimens for tension testing, hardness testing in the cast, hot rolled, cold rolled, and the annealed and normalized conditions. Three hours of laboratory per week. Taken concurrently with MTT 604. (F) 1 q.h.

606. *Physical Metallurgy (Adaptive II).* Polycrystalline pure metals, freezing of pure metals, nucleation and growth of crystals, grains and grain boundaries, grain size, and grain growth. Solid metallic recrystallization after plastic deformation. Introduction to the iron-iron carbide system. Three hours lecture and three hours of laboratory per week. Prereq.: MTT 604. (W) 4 q.h.

608. *Physical Metallurgy (Adaptive III).* Continuation of MTT 606, non-equilibrium transformation in iron-iron carbide system; iso-thermal transformation curves; heat treatment and theory; applications of heat treatment of common ferrous metals and alloys and non-ferrous metals and alloys. Three hours lecture and three hours laboratory per week. Prereq.: MTT 606. (Sp) 4 q.h.

610. *Metallurgy of Iron and Steel.* Manufacturing process of iron and steel; open hearth process; blast furnace process; rolling mills (semi-finish and finish mills); electric

*Social Studies elective—Select one course maximum from any two of: geography, history, political science, psychology, sociology or social science.

furnace steel making; L & D (Basic oxygen process) B.O.P. and customer specifications and applications. Three hours lecture and three hours laboratory per week. Prereq.: Chem. 502, MTT 500. (W) 4 q.h.

HOME ECONOMICS

Associate Professors Hakojarvi (chairman), Feldmiller, and McMillan; Assistant Professor Horvath.

The Department of Home Economics offers opportunities both for the student who wishes a general knowledge of the field and for the student who wishes to prepare for a profession.

There are five academic programs in home economics: two-year programs in child care technology and dietary technology leading to the degree Associate in Applied Science; and four-year programs in home economics leading to a Bachelor of Science in Applied Science degree with a major in general home economics or a major in food and nutrition (dietetics), or a Bachelor of Science in Education degree (in cooperation with the School of Education) with a major in Home Economics Education.

ASSOCIATE IN APPLIED SCIENCE DEGREE

The Child Care Technology Program is designed to prepare the student for work in nursery schools and day care centers. The program consists of 95 quarter hours with a suggested curriculum given at the end of this section.

The Dietary (Food Service) Technology Program is designed to prepare the student for work in the dietary departments of hospitals and nursing homes and in commercial food service systems. The program consists of 95 quarter hours with a suggested curriculum at the end of this section.

BACHELOR OF SCIENCE IN APPLIED SCIENCE DEGREE

Students working toward a baccalaureate degree have three options: general home economics, food and nutrition (dietetics), and home economics education.

Students must meet the general University requirements for the Bachelor of Science in Applied Science degree as specified elsewhere in the bulletin, as well as the following requirements for the major:

Department Core Requirements:

Home Economics 550, 551, 551L, 601, 652, 850.

Science Requirements:

Biology 551, 552, 604.

Chemistry 501, 502, 503 (or 515, 516, 517).

Requirements for selected options:

Home Economics, General

The program provides a broad general education and offers flexibility for the student who wishes to combine it with a minor in preparation for a career in business or communications.

Home economics courses required in addition to the departmental core and general University requirements are: 503, 604, 701, 705, 706, 707, 762, 763, 770, 852 and electives to meet career needs.

Food and Nutrition (Dietetics)

Students selecting this option meet the academic requirements of the American Dietetic Association for a therapeutic and administrative internship.

Courses required in addition to the departmental core and general University requirements are:

Home Economics 611, 759, 760, 809, 810, 857.

Accounting 605.

Management 804 or Psychology 712.

Psychology 701 or 709.

Chemistry 705.

Home Economics Education

The program offers courses leading to the degree of Bachelor of Science in Education given by the School of Education with a major in home economics.

Home Economics courses required in addition to the departmental core and general University requirements are: 503, 604, 701, 705, 706, 707, 762, 763, 770, 800, 852.

The student should also read carefully the information provided in the School of Education section on the requirements of that school and of the State of Ohio for certification as a teacher.

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. Prereq.: Consent of instructor. 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. Three one-hour discussion and two two-hour laboratory periods a week. (F,W,Sp) 5 q.h.

529. *Media Communication for Home Economists.* 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. 4 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. (F) 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. (F,W,Sp) 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. (F,W,Sp) 1 q.h.

601. *Principles of Food Preparation.* The basic principles and comparative methods in the preparation of commonly used foods. Two one-hour lectures, two two-hour laboratory periods and one discussion period a week. (F,W,Sp) 5 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 two hours of laboratory per 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 two-hour laboratory periods a week. Prereq.: Home Economics 503. (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. (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. (Sp) 4 q.h.

611. *Quantity Foods.* Quantity food procedures and techniques with emphasis on retention of nutritive value of foods. Kitchen organization and planning of quantity production, use of large and small food preparation equipment; food controls, quality food standards and cost levels. Two hours of lecture and four hours of laboratory per week. (F,Sp) 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.* Study of 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 will be included. (Sp) 4 q.h.

628. *Practicum in Dietetic Technology.* Experience in the supervision of food production and service under the direction of

professional personnel. Administrative technician experience in the areas of purchasing, patient instruction, and scheduling of employees' work load. Two eight-hour days at an assigned health-care facility plus one hour of discussion at the University per week. Prereq.: Application filed with instructor two quarters prior to registration for the course. (F,W,Sp) 9 q.h.

650. *Seminar in Dietetic Technology.* The role of the dietetic technician in the hospital; trends in the food service industry. Administrative and therapeutic opportunities for the graduate. Prereq.: Home Economics 628 or equivalent. (Sp) 2 q.h.

652. *Meal Management.* Nutritional, aesthetic, and social aspects of planning, purchasing, preparing and serving food to families and groups at different income levels. Prereq.: Home Economics 601. (W,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. Development of food habits conducive to good nutriture throughout life will be emphasized. Prereq.: Home Economics 502 or 551. (W,Sp) 4 q.h.

Upper Division Courses

701. *Textiles.* A basic study of fibers, yarns, fabric construction, and finishes and their importance in the selection, purchase, care, and serviceability of textiles for clothing and home use. Two one-hour lectures and two two-hour laboratory periods a week. Prereq.: Home Economics 503. (Sp) 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 and 701. (Sp alternate years) 5 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 604 and 701. (Sp) 4 q.h.

705. *Child Psychology.* Identical with Psychology 755 except for the addition of directed observation. Home Economics 706 taken concurrently. (F,W,Sp) 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. (F,W,Sp) 2 q.h.

707. *Psychology of Marriage and Family Relations.* Identical with Psychology 707. (F,W,Sp) 3 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.: Biology 552, Chemistry 705, and Home Economics 551. (F) 4 q.h.

760. *Nutrition in Disease.* The modification and adaptation of a normal diet to meet the special needs in abnormal conditions. Prereq.: Home Economics 759. (W) 4 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. (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.: Consent of instructor. (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. (W) 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. 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.* The principles of business organization and management as applied to problems of institutional food service. Three lecture hours a week. (W) 3 q.h.

810. *Experimental Cookery.* Application of scientific principles and experimental procedures to cooking processes. Two three-hour laboratory periods a week. Prereq.: Chemistry 503 and Home Economics 652. (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. (W) 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. (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 551, and consent of instructor. 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 2-4 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.

CHILD CARE TECHNOLOGY CURRICULUM

FIRST YEAR

FIRST QUARTER	Hrs.
English 550 Basic Composition I	4
Biol. 504 Human Evolution and Genetics	4
Home Ec. 502 Nutrition Fundamentals	4
Psych. 501 Introduction to Psychology	3
	15

SECOND QUARTER	Hrs.
English 551 Basic Composition II	4
Biol. 505 Biology and Modern Man	4
Soc. Sci. 501 Introduction to Social Science	3
BE & SS 520 Typewriting I	2
Psych. 707 Marriage and Family Relations	4
	17

THIRD QUARTER	Hrs.
Non-Technical Elective	4
Health and Physical Education 590 Health Education	3
Home Ec. 706 Child Development Laboratory	2
Mus. Ed. 521 Introduction to Music Fundamentals	3
Psych. 755 Developmental Psychology I (Child)	4
	16

SECOND YEAR

FOURTH QUARTER	Hrs.
Art 760 School Arts	4
Home Ec. 672 Nutrition and the Preschool Child	4
H&PE 721 Health Education in Elementary Schools	3
Home Ec. 612 Child Care I	4
Educ. 630 Pre-School Curriculum	3
	18

FIFTH QUARTER	Hrs.
Home Ec. 529 Media Communication for Home Economists	4
Speech 705 Speech Prob. for the Classroom Teacher	3
Home Ec. 613 Child Care II	4
Soc. 500 Fundamentals of Sociology	4
	15

SIXTH QUARTER	Hrs.
H&PE 722C Phy. Ed. for Elementary Grades	3
Home Ec. 614 Child Care III	4
Elective (Technical)	3
Soc. 601 Social Problems	4
	14
Total Credit Hours	95

SUGGESTED ELECTIVES

Art 767 Arts and Crafts I	3
BE & SS 521 Typewriting II	2
Bus. Tech. 500 Survey of Business	4
English 708 Children's Lit.	4
Phil. 500 Life's Ideals	4
Mus. Ed. 621 Music Literature and Appreciation	3
Soc. Sci. 502 Introduction to Economics	3
Soc. Sci. 503 Introduction to Political Science	3

DIETARY (FOOD SERVICE) TECHNOLOGY CURRICULUM

FIRST YEAR

FIRST QUARTER	Hrs.
English 550 Basic Composition I	4
Home Ec. 551 Normal Nutrition I	4
Home Ec. 551L Nutrition Laboratory	1
Home Ec. 601 Principles of Food Preparation	5
Health and Physical Education 590 Health Education	3
	17

SECOND QUARTER	Hrs.
Non-Technical Elective	4
Home Ec. 652 Meal Management	4
Chem. 501 Survey of Chemistry I	4
Soc. Sci. 501 Introduction to Social Science	3
	15

THIRD QUARTER	Hrs.
Chem. 502 Survey of Chemistry II	4
Math. 531 Mathematics of Business	5
Home Ec. 620 Food Systems—Menu Planning, Purchasing and Storage	4
Home Ec. 611 Quantity Foods	4
	17

SECOND YEAR

FOURTH QUARTER	Hrs.
Home Ec. 603 Diet Therapy	4
Home Ec. 628 Practicum in Dietetic Technology	9
Elective (Non-Technical)	4
	17

FIFTH QUARTER	Hrs.
Biol. 604 Food Microbiology	4
Soc. Sci. 502 Introduction to Economics	3
Home Ec. 609 Food Systems—Planning and Operations	4
Elective (Technical)	4
	15

SIXTH QUARTER	Hrs.
Soc. Sci. 503 Introduction to Political Science	3
Acctg. 605 Elementary Accounting I	5
Home Ec. 650 Seminar in Dietetic Technology	2
Home Ec. 610 Organization & Management	4
	14
Total Credit Hours	95

NURSING

Associate Professor DeCapita (chairman); Assistant Professors Engelhardt, Goard, and Watts; Instructors Barabas, Fitzgerald, Hedrick, Jeffrey, Kennedy, and Scheetz.

The Department of Nursing offers the two-year program leading to the Associate in Applied Science degree with a major in nursing.

Graduates of 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 101 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.

Students who continue in the program and successfully complete the requirements of the third and fourth years receive a Bachelor of Science in Applied Science with a major in nursing. A part-time plan may be arranged to accommodate graduates whose employment provides the finances for this education. A total of 194 quarter hours of credit are required for the baccalaureate degree.

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.

Registered nurses who are graduates of approved diploma programs in nursing may gain advanced standing credit in the program through transfer of credit and/or credit by evaluation in accordance with the policies set forth by the University.

Students who have satisfactorily completed the associate degree program in nursing must obtain the registered nurse certificate prior to entering the Upper Division nursing courses leading to the baccalaureate degree.

The following Upper Division nursing courses are required: 705, 706, 707, 805, 806, and 807. All general degree requirements must be met. Electives in foreign language and science may be advised for the nurse who wishes to pursue graduate and/or postgraduate study.

Additional courses required for the baccalaureate degree:

I. In the area of communication and social sciences: English 715 or 740, Speech 652; Psychology 601, 707, 709; Sociology 705.

II. In the area of technical electives and management: Management 725, 750; Computer Technology 500.

All agencies used for field instruction and for clinical practice are approved by appropriate accrediting bodies.

ACADEMIC REQUIREMENTS FOR THE TWO-YEAR ASSOCIATE DEGREE PROGRAM

Transfer applicants from other colleges must meet the general University requirements necessary for all transfer students. In addition, the applicant must have a cumulative point average of 2.5 or better. Credit allowed for courses shall be determined by the Director of Admissions. Specific nursing curriculum requirements shall be determined by the Department of Nursing.

Currently enrolled students at Youngstown State University who satisfy the admission requirements and have a cumulative point average not less than 2.50 are eligible to apply for admission to the nursing program.

A grade of *C* or better is required in all nursing courses.

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. Course grade is determined by combined performance in 501 and 501L. 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 both 501 and 501L. One final grade is given. 501L must be taken concurrently with 501. 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. Course grade is determined by combined performance in 502 and 502L. 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 both 502 and 502L. One grade is given. 502L must be taken concurrently with 502. 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. Course grade is determined by combined performance in 505 and 505L. 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). 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 both 505 and 505L. One grade is given. 505L must be taken concurrently with 505. 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. Course grade is determined by combined performance in 610 and 610L. 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 both 610 and 610L. One grade is given. The course 610 must be taken concurrently with 610L. 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. Course grade is determined by combined performance in 611 and 611L. 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 both 611 and 611L. One grade is given. The course 611 must be taken concurrently with 611L. 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 psychsocial effects of illness are included. Course grade is determined by combined performance in 612 and 612L. 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 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 both 612 and 612L. One grade is given. The course 612 must be taken concurrently with 612L. Prereq.: Nursing 611 and 611L with a grade of *C* or better; 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. 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.: 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, 8 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, bioelectricity, electrocardiography, and psychosocial aspects of nursing care of acute myocardial infarction patient. Three hours of lecture and three hours of laboratory

work per week. Prereq.: Nursing 707 or permission of instructor. (F,Sp) 4 q.h.

711. *Introduction to Pharmacology.* A general survey of pharmacology consisting of lectures and assigned readings. Emphasis is on principles of pharmacology, the consideration of drug groups, and the uses and abuses of drugs. Prereq.: Chemistry 503; junior standing. (W) 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 of seminar and three hours of laboratory work per week are required. Prereq.: Nursing 707 or permission of instructor. (Sp) 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.: 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, 8 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 Anatomy and Physiology of Man	4
Home Ec. 551 Food and Nutrition	4
English 550 Basic Composition I	4
Nursing 501 Introduction to Nursing I	3
Nursing 501L Nursing I Laboratory	2
	17

SECOND QUARTER	Hrs.
Biol. 552 Anatomy and Physiology of Man	4
Psych. 501 Introduction to Psychology	3
English 551 Basic Composition II	4
Nursing 502 Introduction to Nursing II	4
Nursing 502L Nursing II Laboratory	2
	17

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	101

SPECIAL STUDIES

Assistant Professor Foley (chairman); Instructor Gubser.

ASSOCIATE IN ARTS DEGREE

The most general course of study within the Technical and Community College, the Associate in Arts degree program meets some very specific student needs. It is the academic program the student seeks if he wants to go to college now but is not certain about his career goals, the degree program he wants, or his scholastic ability.

1. The Department of Special Studies offers a curriculum consisting of 96 quarter

hours of liberal arts study leading to the Associate in Arts degree. This two-year degree indicates to employers a specific unit of academic achievement for job hiring and advancement. It serves as a basis for entrance into the array of careers and corporate training programs which require an associate degree in general higher education and do not demand specialized training in a single field.

A concentration area will be selected by the student. He may choose from the following areas: social studies, humanities, engineering and mathematical sciences, science or mathematics (including a related health science concentration*), or business administration (may include business and secretarial courses). No grades lower than *C* will be acceptable toward a concentration.

2. The Associate in Arts degree program suits the student who may be interested in ultimately transferring to another degree program but, as a freshman, is unsure of his educational objectives. The curriculum parallels the first two years of four-year programs (providing study in English, the humanities, social studies, and science or mathematics). The student may start in the Associate in Arts degree program and remain until he has selected a major field for another two- or four-year degree program. He may then transfer completed credit hours to this selected field with the approval of the chairman of the next department.

3. This degree program also provides a college education for the student who, to date, may be considered a marginal student. This student may take study skills courses in order to improve his scholastic potential and to help with the adjustment to a university academic environment.

The student enrolled in this degree program benefits from the intensive advisement and counseling assistance which characterizes the Associate in Arts degree program. He is helped to discover how abilities and interests can become the foundation for a better future.

Receipt of the Associate in Arts degree will signify a halfway point toward a baccalaureate degree so long as the student does not change his objective and completes 96 quarter hours which should include:

SUBJECT	Hrs.
Basic Composition I, II	8
Humanities	16
Social Studies	16
Science/Mathematics	12
Health and Physical Education	6
Concentration and Electives	38
	96

501. *Study Skills I.* Considers the development of study skills which aid in academic achievement. Listening skills are practiced and reading speed and comprehension are developed. (F,W,Sp) 3 q.h.

502. *Study Skills II.* Provides an opportunity for a student to develop the ability to express himself in writing. Individual writing deficiencies are the initial concerns of the course. Emphasis is on organization of ideas and fluency in spelling, grammar and punctuation. (F,W,Sp) 3 q.h.

RELATED HEALTH SCIENCE CONCENTRATION IN ASSOCIATE IN ARTS

The following curriculum is designed for students preparing for the related health sciences exclusive of nursing.

FIRST YEAR

FIRST QUARTER	Hrs.
Biol. 506 Principles of Biology I	4
Chem. 501 Survey of Chemistry I	4
Engl. 550 Basic Composition I	4
H&PE 590 Health Education	3
H&PE Activity	1
	16

SECOND QUARTER	Hrs.
Biol. 507 Principles of Biology II	4
Chem. 502 Survey of Chemistry II	4
Engl. 551 Basic Composition II	4
Psych. 501 Introduction to Psychology	3
H&PE Activity	1
	16

THIRD QUARTER	Hrs.
Biol. 508 Principles of Biology III	4
Chem. 503 Survey of Chemistry III	4
Phil. 600 Introduction to Philosophy	4
Elective	4
	16

*See curriculum for Related Health Science Concentration in Associate in Arts.

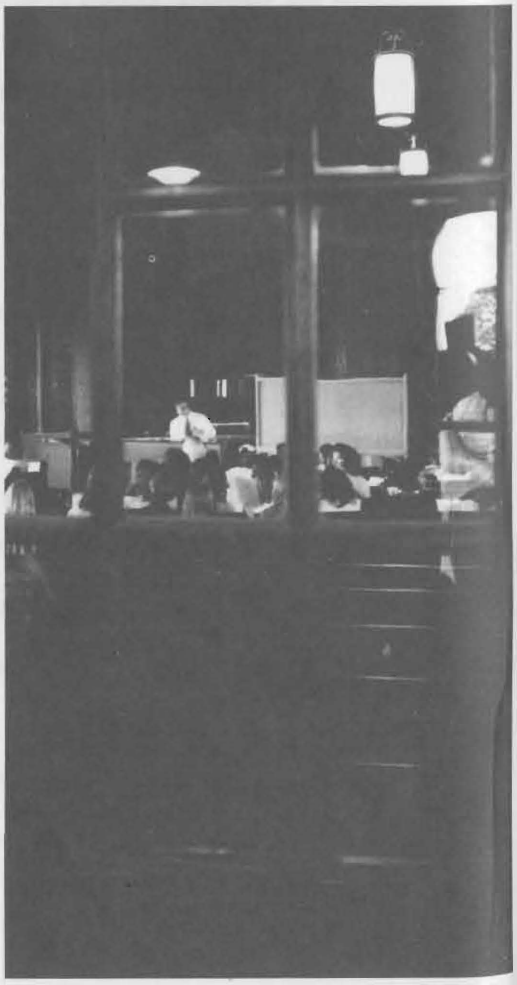
SECOND YEAR

FOURTH QUARTER	Hrs.
Biol. 551 Anatomy and Physiology of Man	4
Math. 501 Geometry I	5
Soc. Sci. 501 Introduction to Social Sciences	3
Elective	4
	16

FIFTH QUARTER	Hrs.
Biol. 552 Anatomy and Physiology of Man	4
Math. 502 Algebra II	5
Soc. Sci. 502 Introduction to Economics	3
Elective	4
	16

SIXTH QUARTER	Hrs.
Biol. 560 Paramedical Microbiology	5
Soc. Sci. 503 Introduction to Political Science	3
Electives	7
H&PE Activity	1
	16

Total Hours 96



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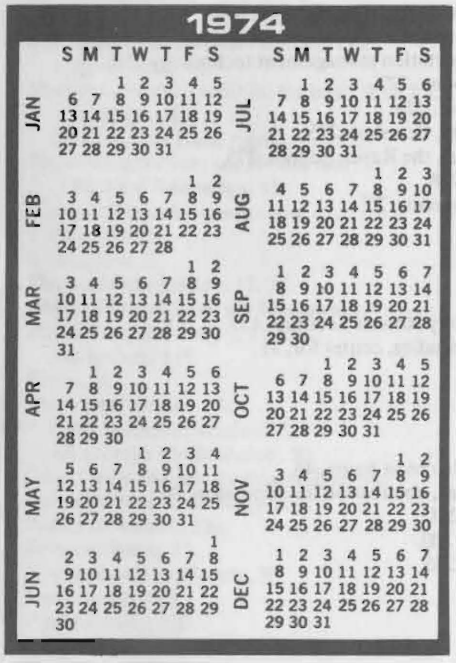
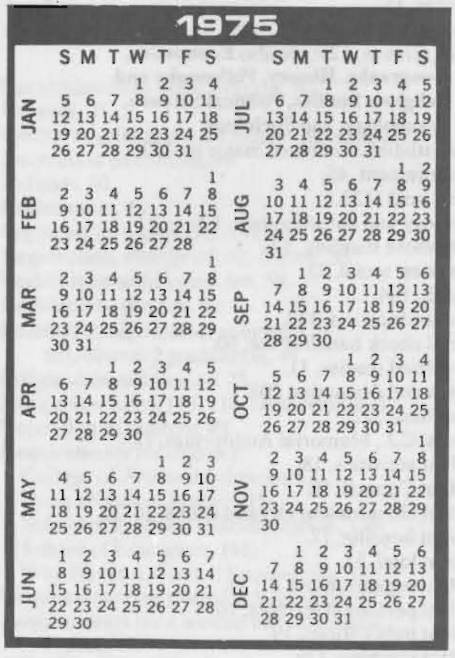
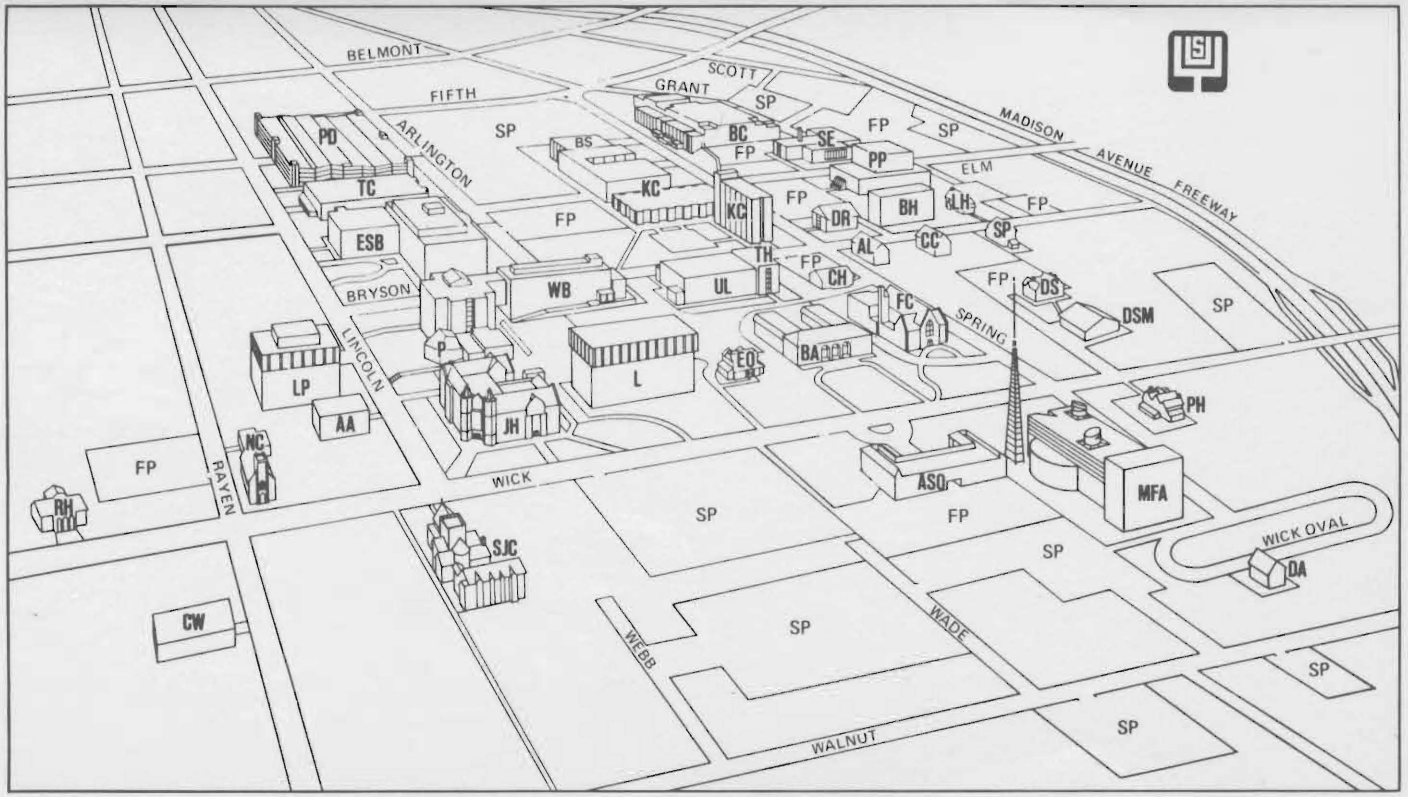




Youngstown State University Campus Map



LEGEND

AA – ADMINISTRATIVE ANNEX
AL – ANIMAL LABORATORY
ASQ – ARTS & SCIENCE OFFICES
BC – BEEGHLY PHYS. ED. CENTER
BS – BOOKSTORE
BH – BUECHNER HALL
BA – BUTLER ART INSTITUTE
CH – CENTRAL HALL
CW – CLINGAN WADDELL HALL
CC – COUNSELING CENTER
DA – DANA ANNEX
DR – DANA RECITAL HALL
DSM – DANA SCHOOL OF MUSIC
DS – DANA STUDIO
ESB – ENGINEERING SCIENCE BUILDING
EQ – EXECUTIVE OFFICES
FC – FIRST CHRISTIAN CHURCH
JH – JONES HALL
KC – KILCAWLEY CENTER
LH – LINDER HOUSE
LP – LINCOLN PROJECT
MFA – MUSIC AND FINE ARTS BUILDING (COMPLETION IN 1974)
NC – NEWMAN CENTER
P – PLANETARIUM
PH – POLLOCK HOUSE
PP – POWER PLANT (COMPLETION IN 1974)
RH – RAYEN HALL
SE – SCHOOL OF EDUCATION
SJC – ST. JOHN'S EPISCOPAL CHURCH
SP – STUDENT PUBLICATIONS
TC – TECHNICAL AND COMMUNITY COLLEGE (COMPLETION IN 1973)
TH – TOD HALL
L – NEW LIBRARY (COMPLETION IN 1974)
UL – UNIVERSITY LIBRARY
WB – WARD BEECHER SCIENCE HALL

PARKING

PD – PARKING DECK
SP – STUDENT PARKING AREAS
FP – FACULTY PARKING AREAS