YOUNGSTOWN STATE UNIVERSITY BULLETIN

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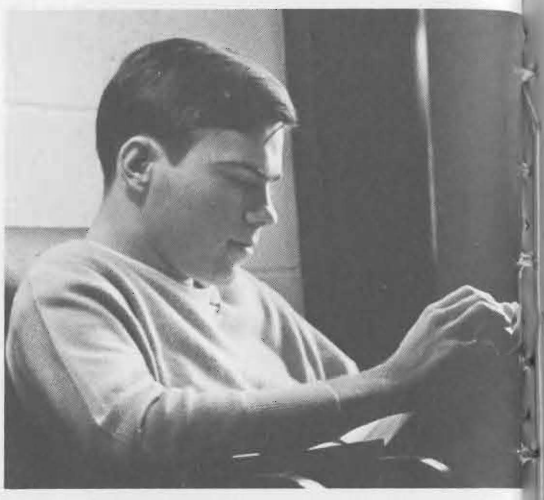

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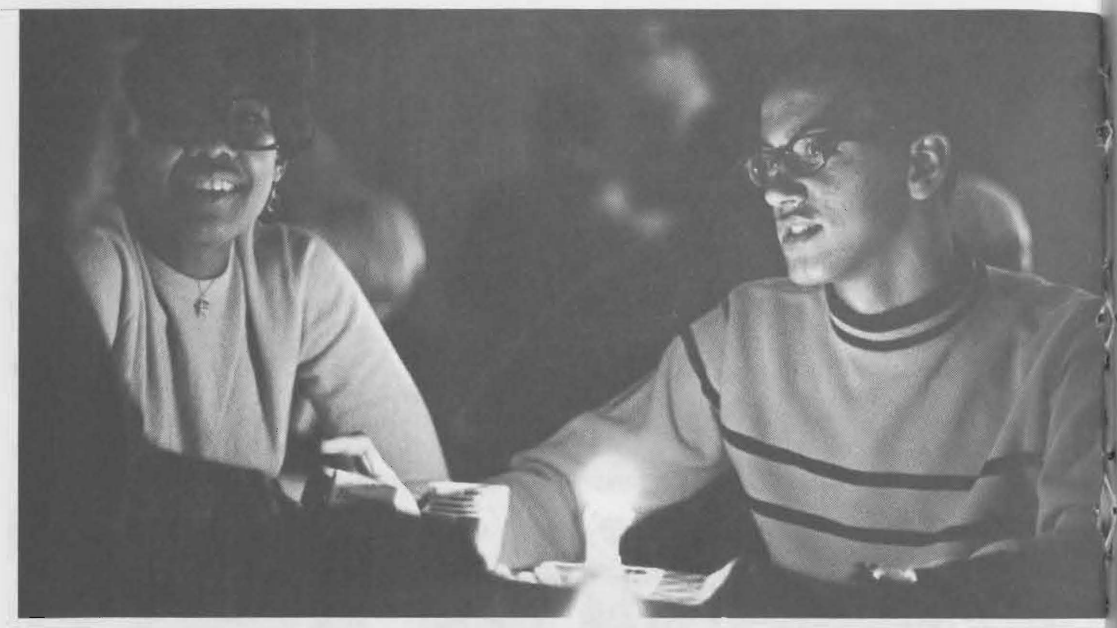
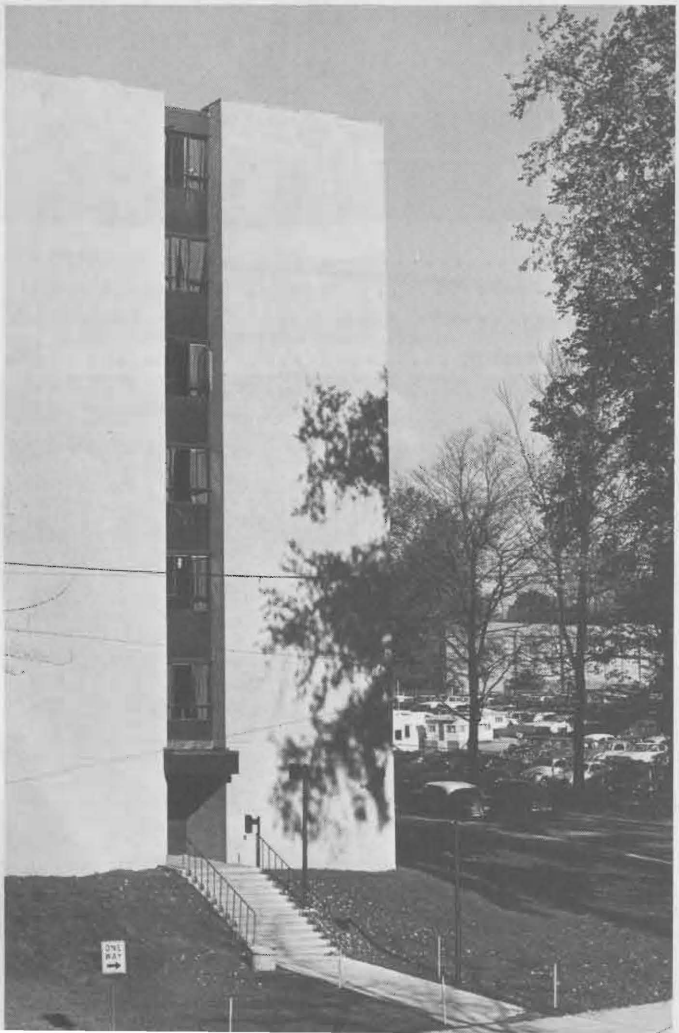




Accreditation

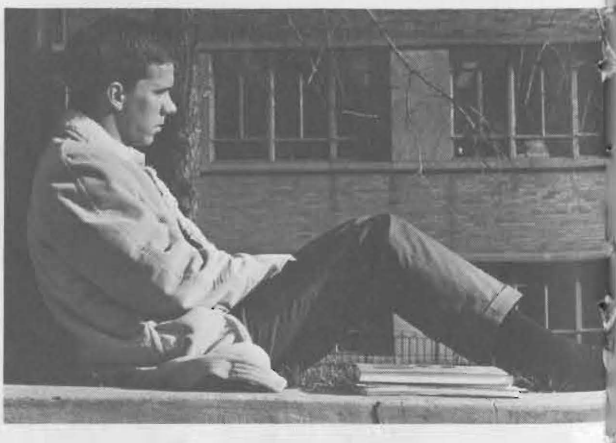
Youngstown State University is accredited by the North Central Association of Colleges and Secondary Schools, by the Department of Education of the State of Ohio as a teacher education institution and by the National Council for Accreditation of Teacher Education. It is on the approved list of the American Medical Association and the American Dental Association. The William Rayen School of Engineering is accredited by the Engineers' Council for Professional Development for its day and evening curriculums for civil, electrical, and mechanical engineering. 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.), and Master of Music (M.M.), Bachelor of Arts (A.B.), Bachelor of Engineering (B.E.), Bachelor of Music (Mus. B.), Bachelor of Science (B.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.).



FALL QUARTER 1969

Date to be announced		Registration and Orientation
October 2	Thursday 8 a.m.	Classes Begin
October 9	Thursday 8 p.m.	Last day to enroll in a class
November 12	Wednesday 8 p.m.	Last day for withdrawing with a W
November 26	Wednesday 8 p.m.	Thanksgiving Vacation Begins
November 26	Wednesday 10 p.m.	Last day to apply for admission or readmission for winter quarter
December 1	Monday 8 a.m.	Thanksgiving Vacation Ends
December 15	Monday 8 a.m.	Final Exams Begin
December 20	Saturday 1:30 p.m.	Final Exams End

WINTER QUARTER 1970

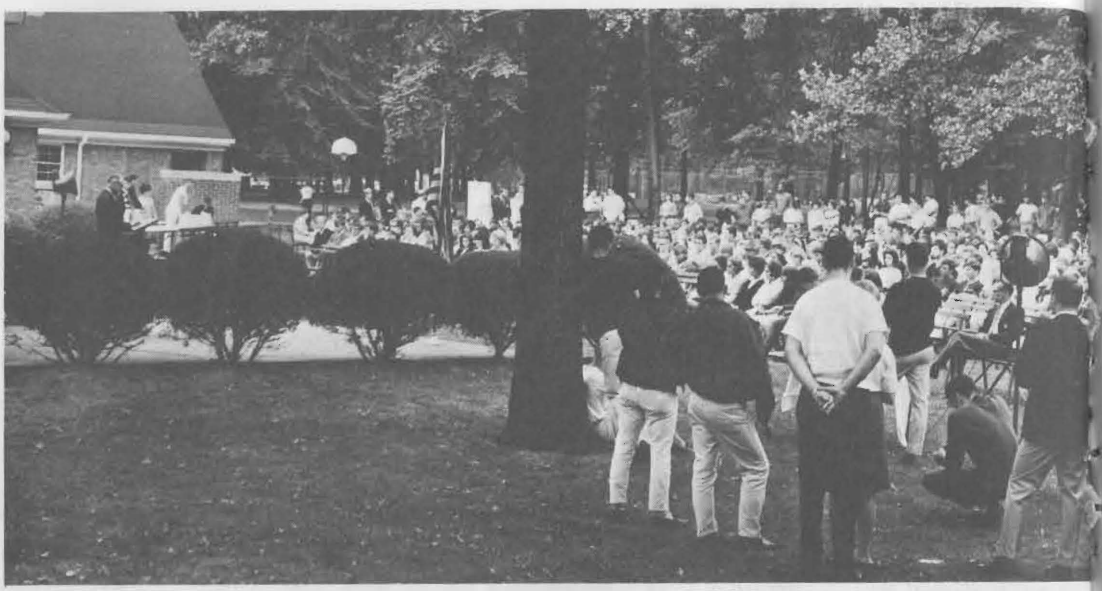
Dates to be announced		Registration and Orientation
January 5	Monday 8 a.m.	Classes Begin
January 10	Saturday 12 noon	Last day to enroll in a class
February 14	Saturday 12 noon	Last day for withdrawing with a W
February 20	Friday 8 p.m.	Last day to apply for admission or readmission for spring quarter
March 16	Monday 8 a.m.	Final Exams Begin
March 21	Saturday 1:30 p.m.	Final Exams End

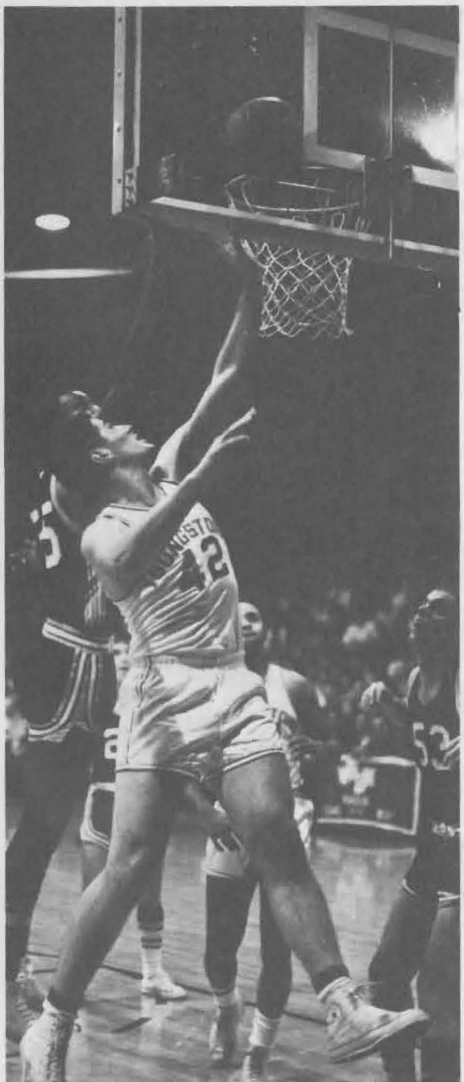
SPRING QUARTER 1970

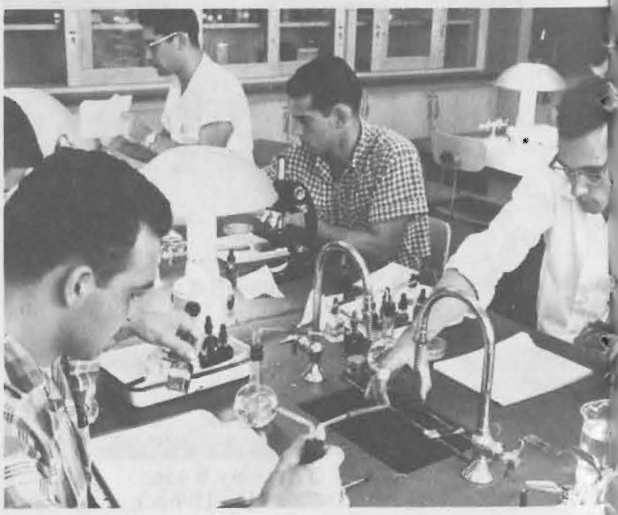
Dates to be announced		Registration and Orientation
March 30	Monday 8 a.m.	Classes Begin
April 4	Saturday 12 noon	Last day to enroll in a class
May 9	Saturday 12 noon	Last day for withdrawing with a W
May 22	Friday 8 p.m.	Last day to apply for admission or readmission for summer quarter
May 30	Saturday	Legal Holiday No Classes
June 8	Monday 8 a.m.	Final Exams Begin
June 13	Saturday 1:30 p.m.	Final Exams End
June 17	Wednesday 8 p.m.	Spring Commencement

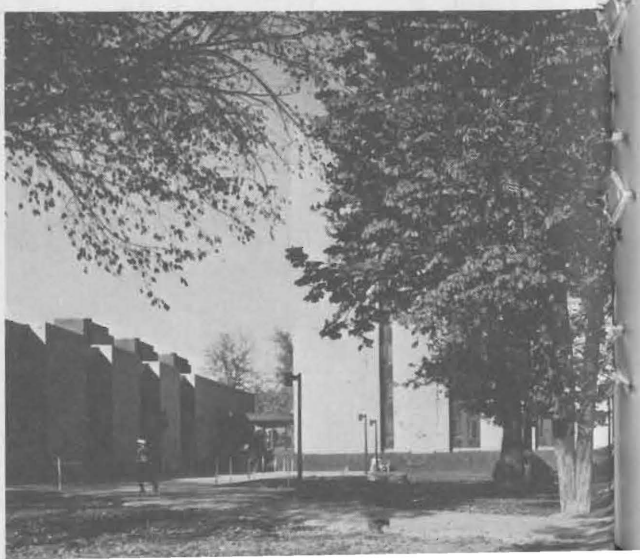
SUMMER QUARTER 1970

Dates to be announced		Registration and Orientation
June 18	Thursday 8 a.m.	Classes Begin—Summer Quarter and First Term
June 20	Saturday 12 noon	Last day to enroll in a class—First Term
June 24	Wednesday 8 p.m.	Last day to enroll in a class—Summer Quarter
July 4	Saturday	Legal Holiday No Classes
July 8	Wednesday 8 p.m.	Last day for withdrawing with a W—First Term
July 29	Wednesday 8 p.m.	Last day for withdrawing with a W—Summer Quarter
July 25	Saturday 1:30 p.m.	First Term Ends (Final Exams during periods)
July 27	Monday 8 a.m.	Second Term Begins
July 29	Wednesday 8 p.m.	Last day to enroll in a class—Second Term
July 31	Friday 8 p.m.	Last day to apply for admission or readmission for fall quarter
August 15	Saturday 12 Noon	Last day for withdrawing with a W—Second Term
August 27	Thursday 8 a.m.	Final Exams Begin—Summer Quarter
September 2	Wednesday 10 p.m.	Final Exams End—Summer Quarter
September 2	Wednesday 10 p.m.	Second Term Ends (Final Exams during periods)
September 2	Wednesday	Summer Commencement









General Information

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.

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 for the first time liberal arts classes were offered in the evening. In 1927 the College of Arts and Sciences, offering daytime classes for the first time, was started. In 1928 the Institute changed its name to The 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 Technical and Community College became part of the University during the spring of 1968.

THE GENERAL PROGRAM OF THE UNIVERSITY

Youngstown State University is a coeducational, 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 College of Arts and Sciences
The School of Business Administration

The School of Education
The William Rayen School of Engineering
The Dana School of Music
The Graduate School
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 early October into June, in three eleven-week quarters. The summer quarter consists of two five and one-half week terms. Courses are so arranged that a student may begin his studies in any quarter.

THE GRADUATE SCHOOL

The Graduate School offers programs in English and history leading to the Master of Arts degree; programs in chemistry and mathematics leading to the Master of Science degree; programs in music education, sacred music, applied music, theory and composition, musicology, and woodwind or brass specialization, leading to the Master of Music degree; programs in Civil, Electrical, Mechanical, and Metallurgical Engineering, leading to the Master of Science in Engineering degree; and Master Teacher (Elementary and Secondary), Principalship (Elementary and Secondary), School Guidance and Counseling, and Special Education (Slow Learners) 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 School of Business Administration, Education, Engineering, and Music, including the science courses in the engineering curriculum.

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 last granted by the School of Education. The major subject may be art, biology, chemistry, classical studies, criminology, dramatics, earth science, economics, English, food and nutrition (dietetics), French, geography, German, health and physical education (or either separately), history, home economics, Latin, mathematics, metal-

lurgy, music, philosophy, physics, political science, psychology, Russian, religion, sociology, Spanish, or speech, or a combination of sciences, social studies, or the humanities. Courses are also offered in astronomy, the Bible, communication (written and oral expression), geology, ancient Greek, Hebrew, Italian, journalism, military science, natural science, and nursing.

THE SCHOOL OF BUSINESS ADMINISTRATION

The School of Business Administration offers courses leading to the degree of Bachelor of Science in Business Administration, with the major in either industrial or public accounting, advertising, and public relations, commercial art, financial management, general business, industrial management, retail or industrial merchandising, 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, and with the Dana School of Music for the Bachelor of Music degree with the major in public school music. The departments of the school are general education, elementary education, 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, mechanical, and metallurgical engineering. All lead to the degree of Bachelor of Engineering.

THE DANA SCHOOL OF MUSIC

The Dana School of Music offers complete courses preparing for public school music teaching, sacred music, musical composition, private teaching, and concert performances. Private instruction is available in voice and in all standard instruments. Professional courses lead to the degree of Bachelor of Music, with the major in voice, an instrument, theory and composition, sacred music, or music education; the non-professional student may elect to study for the degree of Bachelor of Arts, with the major in the history and literature of music.

THE TECHNICAL AND COMMUNITY COLLEGE

The Technical and Community College offers two-year programs in associate in arts, food service technology, and police science technology leading to the degree of Associate in Arts; two-year programs in accounting technology, advertising technology, business administration technology, commercial art technology, general business technology, merchandising technology, public administration technology, and secretarial studies leading to the degree of Associate in Applied Business; and two-year programs in civil engineering technology, computer technology, electrical engineering technology, mechanical engineering technology, metallurgical engineering technology, and nursing leading to the degree of Associate in Applied Science. Non-credit courses designed to meet the needs of Continuing Education in the area are offered as the need is developed.

CAMPUS DEVELOPMENT

During its earlier years the institution had a number of homes. Starting in the old Central Y. M. C. A. building, it oc-

cupied various sites on Wick Avenue until the completion of the present 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 was completed; in 1962 Central Hall Annex, housing a dining room and the Bookstore, was built; in 1966 the Kilcawley Student Center was dedicated; and in 1967 the Ward Beecher Science Hall was completed. The new Engineering Science Building was opened in the fall of 1968.

In addition to the 19 major buildings already in use on the campus, the University is currently engaged in a six-year multi-million campus development program. The 87-acre campus will include a health and physical education building with an indoor Olympic-size swimming pool, a music and fine arts building, a technical and community college building, several liberal arts classroom buildings, residence halls, and other related structures.

BUILDINGS AND OTHER FACILITIES

The central group of buildings lies north and west of the junction of Wick and Lincoln Avenues and houses most of the College of Arts and Sciences, the School of Education, and the School of Business Administration. The principal building of the Dana School of Music is on Wick Avenue while the Dana Recital Hall is on Spring Street and the Dana Studio on Bryson Street. A new building to house the School of Engineering was ready for occupancy in the fall of 1967 and is in the block bounded by Lincoln Avenue, Bryson, Arlington, and Elm Streets. On Wick Avenue, opposite the Dana School of Music, are *Pollock House,* used in part by the College of Arts and Sciences, and *Ford Hall.* The Arts and Sciences Office Building is on the east side of Wick Avenue across from the Butler Institute of American Art.

THE CENTRAL CAMPUS

The most prominent of the central group 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 departmental offices of the College of Arts and Sciences.

The buildings close to Jones Hall supplement the classroom, laboratory, and office space in the central area and augment the facilities of the Music School. Immediately northeast of Jones Hall is *East Hall.* North of Jones Hall, between West Hall and East Hall, stands *Central Hall,* a large frame structure; on the first floor are classrooms, and on the second floor are the Health Center and music facilities, including an auditorium.

Just north of Central Hall and attached to it is the Bookstore. The building is of pink brick with stone trim, in keeping with the Library and Science Buildings.

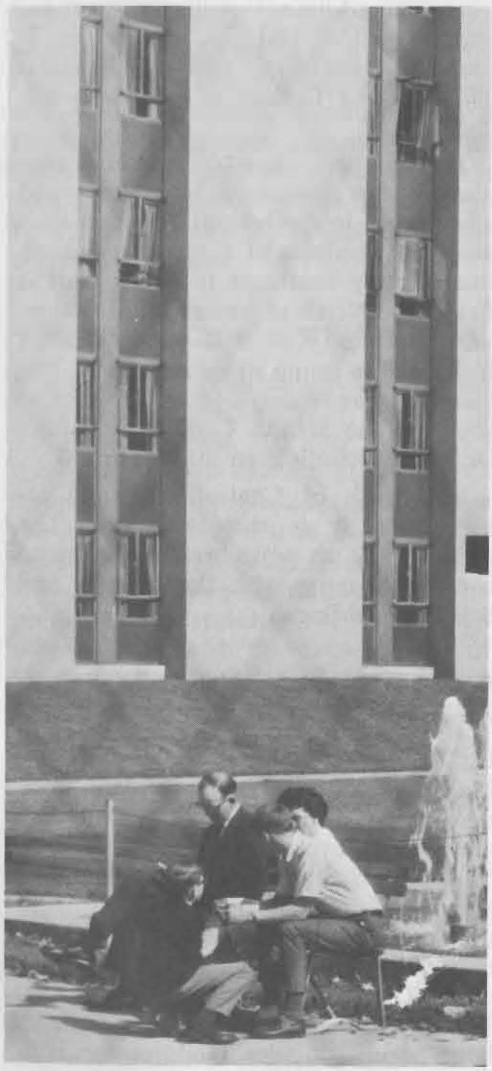
C. J. STROUSS MEMORIAL AUDITORIUM

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 con-

certs, operas, plays, lectures, and assemblies.

THE UNIVERSITY LIBRARY

The Youngstown State University library is in the center of campus, and all departments are served in this centralized facility. At present it contains more than 179,377 volumes and 2,300 periodical subscriptions, as well as microfilms, microcards and recordings. 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 permit 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 each floor and there are booths for typewriters and adding machines.

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 conducts an annual fund drive and has been responsible for a large portion of recent library expansion.

JOHN TOD HALL

John Tod Hall, a wing at the north end of the library building, contains nine classrooms and the men's athletic offices. 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 laboratories and a reactor room equipped by the Atomic Energy Commission. Included in the new addition is a well-equipped and modern planetarium.

FORD HALL

Ford Hall was given to the University in 1951 by Judge and Mrs. John W. Ford and Judge Ford's sister, Mrs. Benjamin Agler. It had been the Ford family home. Its grounds, together with those of Pollock House and the Dana School of Music, form the University's north campus. In it are classrooms, the offices of the Department of Psychology, the Testing Office and the Counseling Service.

POLLOCK HOUSE

Pollock House, across from the Dana School of Music, provides a pleasant and convenient setting for dinners, 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 class rooms 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, equipment, 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 of the College of Arts and Sciences.

RAYEN BUILDING

Rayen Building, on the northwest side of Wick Avenue southwest 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 had 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 department of Secretarial Studies and Nursing program offices and is also used for general university classes.

THE SCHOOL OF EDUCATION BUILDING

The School of Education Building, formerly the Elm Street School, is a modern brick building with eighteen classrooms, offices for administrative personnel, a gymnasium, showers, and other facilities. The building is being used by the School of Education, the women's health and physical education department, 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.

THE KILCAWLEY STUDENT CENTER AND DORMITORY

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

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 and the Director of University Relations and their staffs.

ENGINEERING SCIENCE BUILDING

The newest addition to Youngstown State University's physical plant is the $5,000,000 Engineering Science Building, 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, 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 seven departments —economics, English, history, philosophy, political science, sociology, and speech; the deans of arts and sciences, and the graduate school.

LABORATORIES

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

The *biology* laboratories are equipped for individual performance of standard exercises in all basic courses and in the more advanced phases of embryology, histology, and anatomy. For the study of local flora and fauna, Mill Creek Park provides an excellent natural area of over three square miles and also a museum.

The *chemistry* laboratories have individual equipment for standard experiments in general, biological, and physical chemistry, qualitative and quantitative analysis, organic preparations, and organic analysis. Special equipment affords means for extensive work in instrument analysis.

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 *language* laboratories are equipped with a console and 56 booths, each containing a tape deck. Several programs may be sent out simultaneously to the booths from the console's two tape decks and record player. Responses may be monitored and recorded at the console. Students may borrow tapes from the tape library to play at the booths for listen, listen-respond, or listen-record-playback practice. Tapes containing drill material co-ordinated with the text books are available, as well as other drill 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 freshmen 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 first floor of the School of Education Building provides offices, classrooms, activity areas, and locker and shower facilities for women's health and physical

education activities. There is a playing field behind Ford Hall and a tennis court near the same building. The University also uses the facilities of the Y.M.C.A., about four blocks away; the Y.W.C.A. swimming pool, one block away; Harrison Field, east of Wick Avenue; and the well-equipped Volney Rogers sports field in Mill Creek Park. Varsity teams use Rayen Stadium and South Field House by arrangement with the Youngstown Board of Education; Stambaugh Field, the gift of Mr. Arnold Stambaugh, for practice; municipal tennis courts; and the Logan Driving Range.

PARKING AREAS

Parking facilities for students include a large lot on the east side of Wick Avenue between Lincoln Avenue and Spring Street; a lot on Spring Street east of Wick Avenue, behind Ford Hall; one at Spring and Elm; and another lot on Lincoln Avenue. Faculty members use two lots in the central area, one north of the library, one on Elm Street, one at Arlington Avenue and Elm Street and a lot at the Rayen Building. Students are not permitted to drive into the main campus.

NEIGHBORING FACILITIES

A number of community facilities have been made available for University use. Mill Creek Park is exceptionally favorable for biological study; through the social agencies of the city, sociology students may do practical social work; and Youngstown radio and television stations grant the University the use of their time and equipment. 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 Protestant 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. The spirit of co-operation thus manifested is a healthful one and engenders a favorable atmosphere in which to carry forward the program of the University.

SERVICES

THE BOOKSTORE

The Youngstown State University Bookstore, in Central Hall Annex, sells textbooks and other required supplies. Other stores in the Youngstown area do not stock most University textbooks and are not authorized to issue books or materials on Veterans Administration book orders except for certain items. On the other hand, the Bookstore does not attempt to compete with other stores in the area and carries only a few items beyond those prescribed for courses. It does, however, stock in limited quantities a wide selection of standard works in inexpensive editions, because of their value as collateral reading. The Bookstore will order any book on specific request and a suitable down payment.

CHAPLAINS AND RELIGIOUS ACTIVITIES

Two full-time chaplains are available on the campus, one supported by the Roman Catholic Diocese of Youngstown and one by the Council of Churches of Youngstown and Vicinity. The services of a

rabbi and those of two Orthodox Catholic chaplains are also available.

The Young Men's Christian Association, the Young Women's Christian Association, and many churches are within easy walking distance of the University.

COUNSELING, GUIDANCE AND TESTING

Students who need advice or counsel may avail themselves freely of the time and services of the University Counseling Center, the Dean of Women, the Dean of Men, and the Veterans' Education Officer. These counselors assist students who desire help in preparing for the future, in studying effectively, or in creating satisfying lives. Aids used for guidance include vocational and interest tests.

Other tests available include the general intelligence examinations administered to entering students who request them and tests in personality, mechanical comprehension, and special aptitudes which may be taken at any time by appointment.

The Chartered Life Underwriters examination and others may be taken by students of certain courses in business organization. The student interested may inquire at the Counseling Center.

HEALTH SERVICE

To promote and maintain good health, the University requires that each applicant entering as a full-time or transfer student provide the University with the results of a physical examination recorded on the *Youngstown State University Physical Examination Form*, which will be given to the student when he has been accepted for admission to the University. The applicant must take the form to a physician of his choice, be examined at his own expense, and return the form, completed by the physician, to the Admissions Office. No student who is required to take the examination will be fully admitted until the Admissions Office has received the completed form.

Every student receives at least three quarter hours of instruction in health education as part of the general University requirement in health education and physical education.

The *Health Center* is on the second floor of Central Hall. A registered nurse is on duty from 8 a.m. to 8:30 p.m. Monday through Friday and at other times by special arrangement; she can always be located through the University switchboard operator. The University provides emergency care; continued treatment, if necessary, is paid for by the student. Any injury occurring on campus should be reported to the Health Center within twenty-four hours.

Group insurance to cover hospital and/or surgical care (Blue Cross and Blue Shield) is available to all students at the time of registration, at a semi-annual fee payable in advance. The plans are voluntary, community-sponsored, and non-profit, with no occupational restrictions. Membership may be retained after leaving the University. Students interested may inquire at the Business Office.

The University is a member of the Ohio College Health Association and the American College Health Association.

PHYSICAL EDUCATION PROGRAM

A program of physical education is offered to meet the needs, interests, and abilities of students. The program includes the required physical activity courses, intramural and recreational sports, and intercollegiate athletics.

The intramural and recreational program offers archery, badminton, basketball, bowling, fencing, field hockey, football, golf, handball, softball, tennis, table tennis, and volley ball. Other activities may be added as facilities become available and as required to meet student interests. Students are encouraged to choose activities from which they are

likely to derive healthful pleasure in later life.

INTERCOLLEGIATE ATHLETICS

Men's intercollegiate athletics are conducted at Youngstown State University to enlist the interest of the entire student body in healthful amateur sport. Participation is open to any male member of the student body who qualifies under the regulations of the Athletic Policy of Youngstown State University. Intercollegiate competition is provided in football, basketball, baseball, tennis, swimming, golf, and rifle.

The University is a member of the National Collegiate Athletic Association (N.C.A.A.).

RIFLE TEAM

The Youngstown State University Rifle Team, coached by the R.O.T.C. detachment, is a member of the Lake Erie Intercollegiate Rifle Conference and the National Rifle Association. Interested students should apply to the Department of Military Science.

PLACEMENT SERVICE

With the co-operation of the Ohio State Employment Service, the University maintains a full-time Placement Office, the services of which are free to undergraduates, graduating students, and alumni for either permanent employment, including teaching positions, or part-time work. It is on the campus in East Hall.

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

SELF-HELP

The central location of the University makes it possible for many students to earn part or all of their expenses by working in nearby stores and industrial plants. The Placement Office assists students seeking such employment.

However, if the student plans to do such work while enrolled in classes, and especially if it is full-time work, he is advised to carry only a part-time college program, since *the University accepts no substitute for satisfactory academic achievement.* He should understand that for each quarter hour of credit, at least three hours of academic endeavor are expected weekly (see *General Regulations*), so that a 16-hour class schedule should take at least 48 hours a week study and class sessions.

OFFICE OF THE DEAN OF WOMEN

The Dean of Women is responsible for the welfare of the women students of the University. Her office is located in Jones Hall.

A major duty of the Dean of Women is to assist the University staff and student officers of all student groups in problems of administration and program, especially the social program. She supervises the social sororities as well. Scheduling of all events by the Coordination and Calendar Committee is centered in this office.

Information on housing for women students is available in this office.

OFFICE OF THE DEAN OF MEN

The Dean of Men is responsible for the welfare of the men students of the University. He assists the Director of Admissions in the selection of students, coordinates high school-college relations, and works with the Office of Public Relations on University-community affairs. He is responsible to the Vice-President for Administrative Affairs. His office is located in Jones Hall.

POLICIES ON STUDENT HOUSING

A college student living away from home and in this community is expected to conduct himself or herself as a respon-

sible adult. The University will regard student behavior on or off campus as its concern. Students who do not observe University regulations are subject to discipline or dismissal.

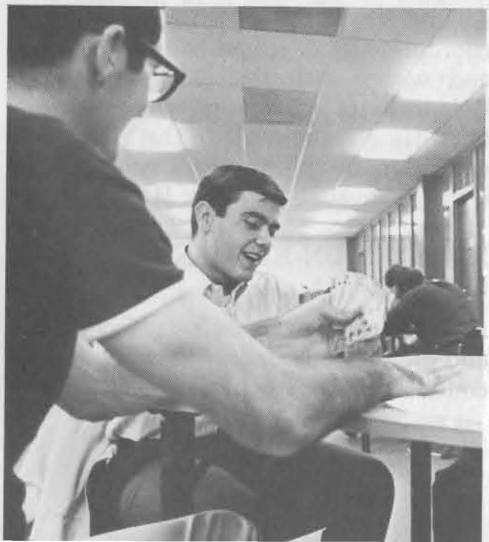
Although admission to the University does not obligate the University to secure living accommodations for the student, the University will assist the student in finding a satisfactory place to live. In accord with the basic principles of the University concerning human rights, no campus housing nor off-campus housing will be recommended to students that discriminates on the basis of race, color, or creed.

All students must file a housing card at the time tuition is paid, indicating that definite housing arrangements have been made. For students not living at home or with relatives, housing should be from the approved list. It is the responsibility of all students to notify the Registrar's office when their address is changed.

STUDENT HOUSING ON CAMPUS

The University has limited residence hall facilities and the present-time accommodations are for *men* only.

Residence hall accommodations include room and food service on a contract basis for the quarter(s) requested. Charges are $300 a quarter, $850 for a full academic year, and $1,125 for a full academic year and summer quarter.



Further information and applications can be obtained by writing to the Residence Hall Manager, Kilcawley Student Center.

OFF-CAMPUS HOUSING FOR MEN

The University provides a list of approved off-campus housing. This housing has been inspected and has met the minimum University standards. The University does not place students in off-campus houses and, therefore, personal arrangements must be made for these facilities. Only those facilities that appear on the University's approved housing list are recommended. For further information, contact the Housing Office.

OFF-CAMPUS HOUSING FOR WOMEN

Women students not living at home must have their housing arrangements approved by the Dean of Women. There are several privately operated residence hall facilities in the immediate University area which have been approved for women student occupancy. Information concerning these and other off-campus housing is available by contacting the Dean of Women's Office.

FOOD SERVICE

Any student not residing in a University Residence Hall may purchase a meal ticket for any given quarter at a cost of $175. Arrangements for this are made through the office of the Residence Hall Manager, Kilcawley Student Center.

The cafeteria in the Kilcawley Student Center also serves meals and light lunches à 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 every locker. The University assumes no responsibility for personal property left in a locker at any time.

ALUMNI OFFICE

An up-to-date record of the more than 14,000 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, in addition to other information.

The Alumni Office is located in the Kilcawley Student Center.

THE ALUMNI ASSOCIATION

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

STUDENT ACTIVITIES

The University encourages student participation in extra-curricular activities. However, since the student's scholastic standing is always of first importance, participation in extra-curricular activities is limited to students whose grade averages are as high as their class rankings require, as stated under General Regulations. A student on academic or social probation may not take part in such activities. Also, participation is not permitted to any student on disciplinary probation.

Every student organization, whether social, professional, or general, must be chartered by Student Government and must have at least one faculty adviser, appointed by and responsible to the President of the University. Student organizations are required to comply with University rules and regulations.

Youngstown State University students may participate in frequent social activities. Through the dances and receptions sponsored by Student Government, fraternities, and other campus groups, and through the other activities of these organizations and of the various special-interest clubs, opportunity is afforded to meet faculty members and fellow students and to develop pleasant associations and friendships. Pollock House and the Frank Purnell Room of the library afford attractive settings for social hours, and a large cafeteria and student lounge, as well as student offices and meeting rooms, are housed in the new Kilcawley Student Center. In addition, activities at the Y.M.C.A., the Y.W.C.A., and at various churches, are open to all who are interested, and women students living at Buechner Hall may participate in activities there.

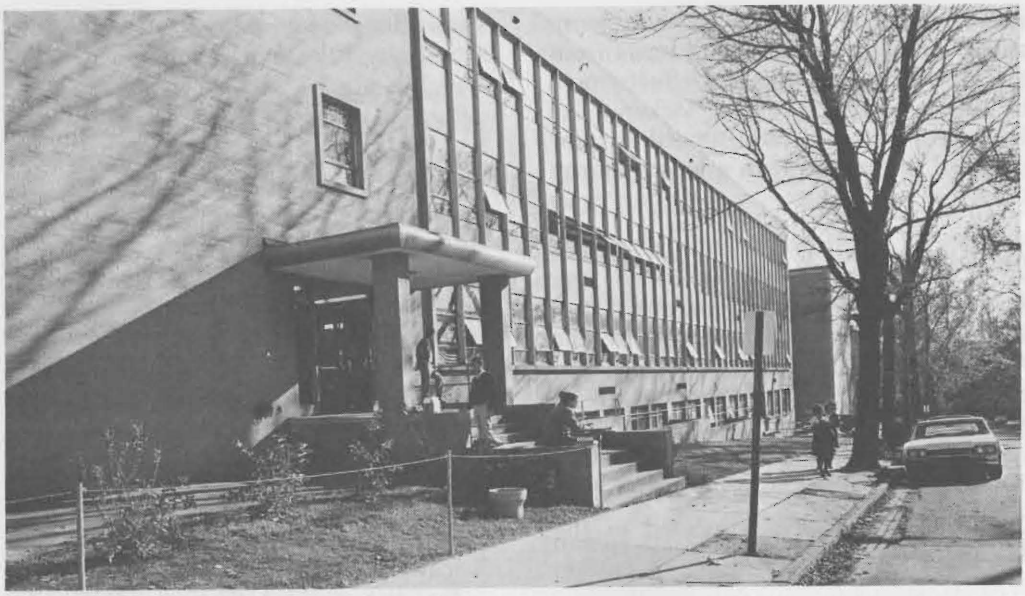
HONOR POINT SYSTEM

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 Women. 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 extra-curricular points.

STUDENT GOVERNMENT

The student body of Youngstown State University is represented in all affairs pertaining to it by the Student Government, which operates under constitutional powers granted by the University



administration. The government is composed of representatives from five undergraduate units, the College of Arts and Sciences, the School of Business Administration, the School of Education, the School of Engineering, and the Dana School of Music, in proportion to the enrollment in each. All meetings of the Student Government 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 establish necessary disciplinary regulations, 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 Government is a portion of the Comprehensive Fee included in students' billing. The funds from this fee allocated to Student Government activities is administered by the Student Government 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 Government.

Operating budget allocation funds for student art shows, debates, dramatic productions, intramural sports, music organizations, and student radio programs, are administered by the groups to whom the funds are allocated. Student Government allocates and administers the funds for Student Government expenses, such as the "Student Handbook," student-body social functions, Deans' Loan Funds, cheerleaders, Honors Day and special projects recommended and approved by members of Student Government.

STUDENT PUBLICATIONS

All student publications of the University are under the supervision of the Faculty-Student Publications Committee.

The *Student Handbook* is published each fall by the Orientation Committee of Student Council.

The *Neon*, the University yearbook; the *Jambar*, a bi-weekly newspaper; and *The Penguin Review*, a literary magazine, are published by student staffs,

whose principal members may be nominated by the outgoing editors but must be approved by the Publications Committee. The *Neon* and *Jambar* are supported by the *Neon* fund, by the Student Activity Fund, and by advertising.

Both projects give students experience in editorial work and news writing and in advertising, financing, and other phases of business management. Thus they serve as laboratories for journalism classes, with credit in limited amounts given for work on the publications. There are scholarships for the editor and business manager of the *Neon*; for the editor-in-chief, managing editors and business manager of the *Jambar*; and for the editor and business manager of the *Penguin Review*.

The *Jambar* is a member of the Ohio College Newspaper Association and the Associated Collegiate Press. The Associated Collegiate Press, in its All-American newspaper critical service has awarded the *Jambar* First Class Honor Rating on content, style, makeup, typography, sports writing, and general quality. The Ohio College Newspaper Association has consistently selected the *Jambar* as one of the state's best biweekly newspapers.

The Penguin Review is a semi-annual journal published by students of the University for the encouragement of creative writing. It prints short stories, poetry, and essays written by students, alumni, and faculty members.

DEBATE AND OTHER FORENSIC ACTIVITIES

The forensic activities at the University include debate, extemporaneous speaking, oratory, discussion, and interpretative reading. The main emphasis is on debate with the debate team participating in about 150 rounds of debate on various college and university campuses throughout the U.S. These include the University of Michigan, Notre Dame University, University of Pittsburgh, Ohio University, and Ohio State University. Campus activities sponsored by the forensic group include the Youngstown High School Cross-Examination Debate Tournament and Reader's Theater.

The Debate Society is open to university students who show ability and willingness to work. Pi Kappa Delta is the national honorary fraternity for the forensic participants who achieve distinction in forensics.

DRAMATICS

All students at the University are invited to participate in the production of plays. During the academic year, at least two major productions are given. Recent productions were *The World of Carl Sandberg* adapted by Norman Corwin and Moliere's *Tartuffe*. An evening of student directed plays included *27 Wagons Full of Cotton* by Tennessee Williams, *The Feast* by Daniel Wright, *The Victims of Amnesia* by Lawrence Ferlinghetti, and *The Hairy Falsetto* by J. I. Rodale. The playwright, J. I. Rodale, was in attendance at the productions. All productions are under the supervision of the University Theatre and are financially supported by Student Council. Admission is charged the general public; University students are admitted by Identification Card.

The University Theatre also produces a series of four one-act plays each season known as Family Plays to improve one's understanding of social problems. The Family Plays series is supported with Federal funds by the Ohio State Department of Mental Health and Correction. Fifty to sixty performances of these plays are given each year before clubs and civic organizations. They are performed on request through the University Theatre office.

The University Theatre is a member of Alpha Psi Omega, the National Dramatics Fraternity. Membership in the local chapter is by points earned from participation in various dramatics activities and is usually not open to students until their junior or senior year.

The University Theatre is also a member of the American Educational Theatre Association, and the American National Theatre and Academy.

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 $100 purchase prize given annually by Student Council to the winner in any medium. Both students and alumni frequently exhibit work at the Institute's Autumn Annual and other showings; and the department periodically exhibits students' work in the departmental gallery.

RADIO AND TELEVISION PROGRAMS

Students of the University from time to time conduct programs of music, drama, news, and other entertainment on all Youngstown radio stations. Most programs are planned, written, produced and announced entirely by students. Several series of television programs have been presented, with others planned for later dates.

The University owns and operates a 22,500-watt stereo FM radio station located in the Arts and Sciences Office Building on Wick Avenue. "WYSU" operates at 88.5 megacycles, and is on the air 11 hours daily, year-round.

UNIVERSITY-RECOGNIZED STUDENT ORGANIZATIONS

Youngstown State University has over 100 student organizations established on its campus. They are chartered by Student Council and supervised by faculty advisers.

HONORARY SOCIETIES

Alpha Delta Sigma is a national honorary advertising fraternity.

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 bases:

> 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 a local honorary society for biology majors. Several field trips a year are a part of its instructional program.

Sigma Tau 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.

The Youngstown State University Honor Guard is an honor society limited to students enrolled in advanced military science courses. It believes in developing good social conduct, the necessity of building character, maintaining leadership, encouraging scholarship, and the promotion of service to country.

PROFESSIONAL ORGANIZATIONS

Alpha Kappa Psi is a national business administration fraternity.

Composers, Authors, and Artists of America is a national organization to promote creative work in literature, art, and music among its members.

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 Junior 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 except freshmen.

The National Society of Pershing Rifles is an honorary society for the promotion and development of interest and proficiency in the basic course of the R.O.T.C. program. Company P, 1st Regiment, is established at Youngstown State University.

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

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 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

Inter-Varsity Christian Fellowship
Newman Club
Jewish Student Fellowship
Orthodox Christian Fellowship
United Campus Christian Fellowship

GOVERNMENTAL ORGANIZATIONS

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
Lambda Xi
Phi Kappa Tau
Phi Sigma Kappa
Sigma Alpha Epsilon
Sigma Alpha Mu
Sigma Phi Epsilon
Sigma Tau Gamma
Tau Kappa Epsilon
Theta Chi
Theta Xi
Zeta Beta Tau

SOCIAL SORORITIES

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

SERVICE ORGANIZATIONS

Alpha Phi Omega‡
Circle K‡
Gamma Sigma Sigma§
Youngstown State University Red Cross

OTHER STUDENT ORGANIZATIONS

Arab Student Organization
Art Club
Community of Concern
Debating Society
Der Deutsche Verein
French Club
History Club
Italian Club
International Students
Little Sisters of Alpha Phi Delta
Little Sisters of the Laurel
Little Sisters of Minerva
Little Sisters of Theta Chi
Los Buenos Vecinos
Madison House of Divine Metaphysics
Order of Diana
Physical Education Majors' Club
Rifle Club
Sisters of the Golden Heart
Ski Club
Social Science Club
Student Education Association
Youngstown State University Chapter of the N.A.A.C.P.
Youngstown State University Chess Club
Youngstown State University Mathematics Club
Youngstown State University Radio Club
Youngstown State University Student Nurses Association
Youngstown State University Soccer Club

‡ Men only
§ Women only

INTER-FRATERNITY COUNCIL and PANHELLENIC COUNCIL

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

Panhellenic Council is made up of two representatives from each active all-University social sorority and has a faculty adviser 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 extra-curricular 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 Henry A. Roemer Awards for Men. Five awards of $100 each are made annually as follows: for scholarship in chemistry; for scholarship in mechanical engineering; for scholarship in metallurgical engineering; for scholarship and for leadership and sportsmanship in athletics; and to the outstanding scholar in the graduating class. The award is named for its donor. Henry A. Roemer, Consultant, Sharon Steel Corporation.

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 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 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 annually awards a bookshelf of books on production and inventory control to the graduating senior in the School of Business Administration majoring in management and with the highest point average in management.

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

The Art Club Award. The Art Club of Youngstown State University offers a prize of $25 in any medium at the annual Youngstown State University Art Exhibition.

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 Chi Omega Alumnae Award. The Youngstown Chapter of the Chi Omega Alumnae gives an annual cash award to the highest-ranking woman student majoring in the social sciences.

The City Office and Art Company Awards. The City Office and Art Company gives three $10 purchase awards for outstanding works shown at the annual Youngstown State University Art Exhibition.

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 Classical Society Latin Prize. The Classical Society of Youngstown State University offers a prize for the best work in the Intermediate Latin course.

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 over a period of five academic years. The award is made in honor of the memory of Louis A. Deesz, the first dean of the William Rayen School of Engineering.

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 Victor George Art Award. The Victor George Academy gives an annual award for meritorious work in any art mtdium.

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 fall quarter. The award is presented at the Greek Sing at Stambaugh Auditorium.

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 Merchandising and the Dean of the School of Business Administration.

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 gives an annual cash award to the outstanding sophomore biology student.

The Panhellenic Council Award. A silver tray is awarded yearly by Pan-Hellenic 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 Roberts Deliberating Club Award in Social Sciences. The Roberts Deliberating Club of Youngstown annually awards $100

to the graduating student ranking highest in the social sciences.

The Scudder Award. The Phi Epsilon Fraternity annually presents an award to the outstanding senior who has majored in chemistry or chemical engineering. The award is named for Dr. Eugene Dodd Scudder, Professor Emeritus of Chemistry and former Chairman of the Chemistry Department.

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 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 George M. Wilcox Award. The William Holmes McGuffey Chaper 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 Latin. The Wolves Club, Den No. 6 of Youngstown, annually offers two awards for meritorious work in Latin on the Upper Division 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 Corps of Cadets Awards. Medals are awarded annually by the chairman of the department of military science to R.O.T.C. cadets as follows: a medal is awarded to each member of the Corps of Cadets squad most proficient in squad drill; and medals are awarded to the first-year, the second-year, and the third-year military science student who is most proficient in individual drill, school of the soldier, and personal appearance.

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.

The Lieutenant Colonel Eugene Lash Award. The Commanding Officer, 2nd A.W. Battalion S.P., 137th Artillery, Ohio National Guard, annually awards a medal to the Youngstown State University R.O.T.C. cadet completing the fourth-year course in military science with the most outstanding record of excellence in military subjects. The name of the recipient is inscribed on a plaque which remains on the Youngstown State University campus.

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 performance 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 names of the recipients are inscribed on a plaque presented to Youngstown State University by the donor. No student may receive either award unless he has completed one full year of the R.O.T.C. course at Youngstown State University.

FINANCIAL AIDS

The University has a comprehensive program of financial assistance developed to aid primarily the promising students who lack the necessary funds for a college education, but also to recognize 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 located in East Hall.

Aid is generally awarded for an academic year beginning with the fall quarter. Entering freshmen and enrolled students should make application for financial assistance for the coming academic year by April 1.

To assure equality in the distribution of financial assistance awards based upon established financial need, the University utilizes the need analysis services of the American College Testing Program and the College Scholarship Service. Each applicant for financial assistance should therefore submit by April 1 a "Family Financial Statement" to the American College Testing Program or a "Parents' Confidential Statement" to the College Scholarship Service. These forms are available in high school offices and from the University's Office of Student Financial Aids.

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 creditable academic record, and (3) character.

The University participates in the federal National Defense 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 90 days, if justified by emergency conditions.

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

The Paul C. Bunn Loan Fund. This fund, established in 1957, is a gift of the teachers of the Youngstown Public Schools in honor of Dr. Paul C. Bunn. Upperclassmen in the School of Education are eligible to receive loans.

The William H. Dana Scholarship Loan Fund. This fund was established by the Alumni of the Dana School of Music as a memorial to the school's founder. Loans are limited to students enrolled in the Dana School of Music.

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.

Youngstown State University participates in the U.S. Office of Education's 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 from $200 to $1,000, depending upon family income, but may not exceed 50% of the total financial assistance the student receives.

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.

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 bases 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 Scholarship. This $750 scholarship is awarded annually by the ALCOA Foundation to a junior or senior in mechanical engineering. Selection of recipient is made by the Chairman of the Department of Mechanical Engineering in coordination with the Director of Financial Aids, and is based upon financial need and academic excellence.

The American Association of University Women, Youngstown Branch, Scholarships. A scholarship grant of $200, first given in 1950, 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 need.

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

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

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 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 Benjamin T. Davis Scholarship. This scholarship was established in 1949 by Judge John W. Davis as a memorial to his brother. The stipend is $300. It is awarded annually to a male graduate of Fitch High School, Austintown, chosen on the basis of recommendations by the Superintendent of Austintown Township schools, the principal of Fitch High School, and the president of the Austintown Township Board of Education.

The Rachel Davis Scholarship. This scholarship is like the Benjamin T. Davis Scholarship except that it is a memorial to Judge Davis' sister and is for a woman graduate of Fitch High School chosen similarly.

The General Motors College Scholarship. The General Motors Corporation, under its College Scholarship Plan, offers annually 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 Junior Civic League Scholarships. These scholarships, established in 1961, are awarded to worthy students by the Junior Civic League of Youngstown.

The Koppers Company Scholarship. The scholarship was established in 1962 by the Koppers Company of Pittsburgh. It is awarded to a deserving student, preferably an upperclassman in chemical engineering.

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 the 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.

Army R.O.T.C. Four-Year Scholarships. These scholarships, established by the Department of the Army in 1965, pay for tuition, books, and other administrative fees. In addition, the recipients receive a subsistence allowance of $50 a month. High school seniors are eligible to apply. Selection is made by the Department of the Army.

Army R.O.T.C. Two-Year Scholarships. These scholarships are the same as the Army R.O.T.C. Four-Year Scholarships, except that their duration is for two years and that an applicant must be a sophomore enrolled in the second year of the four-year R.O.T.C. program to apply.

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 per-

formance, financial need, and contribution to the fraternity.

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 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 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 title of Associate in Business Administration.

The Youngstown Area Board of Realtors Scholarship. This $450 scholarship is awarded annually by the Youngstown Area Board of Realtors to a junior or senior in the School of Business Administration. Applicants should have a 3.0 or higher grade average and an established need for financial assistance. Priority is given to students desiring careers as realtors.

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 merchandizing. Selection of recipient is based upon financial need and academic excellence.

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

THE YOUNGSTOWN EDUCATIONAL FOUNDATION SCHOLARSHIPS

These scholarships vary in amount according to established need and academic ability. The maximum amount normally does not exceed tuition and fees 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 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 Chrysler Corporation Fund. This fund of $2,500 provides scholarship aid to juniors and seniors in the School of Business Administration who are academically promising and who are in need of financial assistance.

The William F. Courtney Scholarships. Three scholarships, established in 1959, are awarded to Catholic students who will teach in the Catholic Diocese school system.

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 Hilda George Hanna Scholarship. This scholarship, established in 1964, pro-

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

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 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 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 Ukranian 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.

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 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.

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 be arranged frequently by the YSU Placement Office of the State Employment Service located in East Hall.

GRADUATE SCHOLARSHIPS

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 Dean of Women. Current notices are posted on the scholarship bulletin board adjacent to that office and on departmental bulletin boards. Five of the more widely known graduate scholarships are described below.

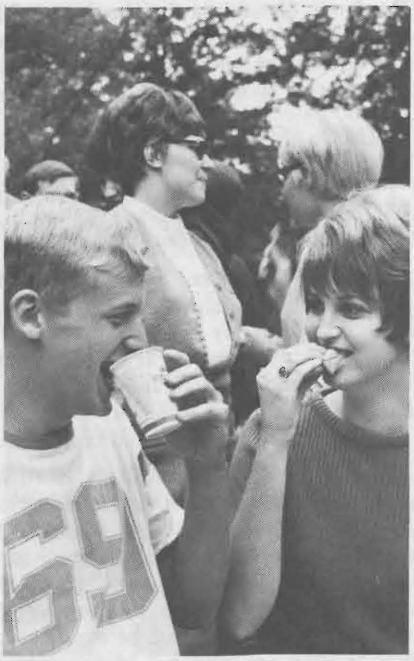
Fulbright Scholarships. United States government scholarships for foreign study are available for graduate study abroad. Applications may be obtained from the Fulbright adviser, Prof. W. L. Miner.

Danforth Graduate Fellowships. These are available to male college seniors or recent graduates preparing to teach or do administrative work on the college level.

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.

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.

The Woodrow Wilson Fellowship Awards. About a thousand of these are awarded yearly for graduate study, principally in the humanities and social sciences, to students who plan to become college teachers. Each appointee receives a liberal stipend and fees. Candidates must be nominated by a faculty member. Further information may be obtained from the campus representative, Dean K. W. Dykema.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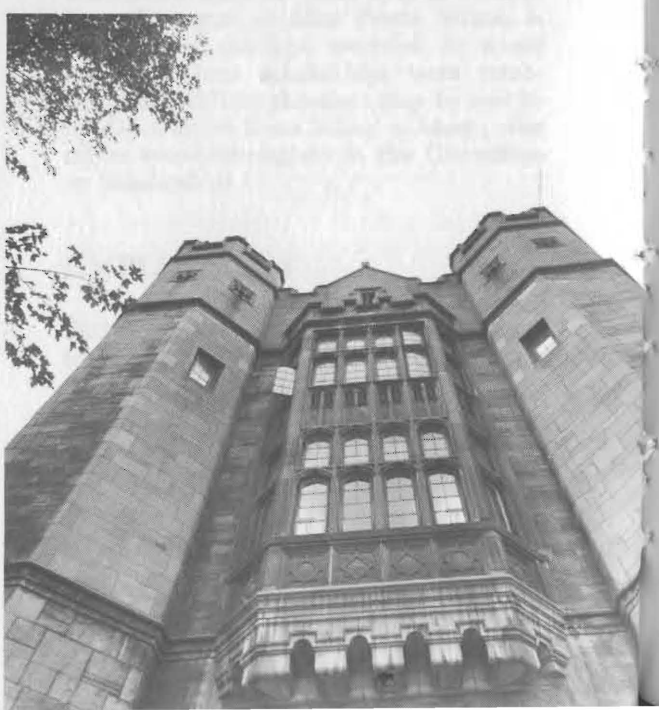


General Requirements and Regulations

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	*CLASSES BEGIN*	*CLOSING DATE FOR APPLICATION*
Fall 1969	October 2, 1969	August 1, 1969
Winter 1970	January 5, 1970	November 14, 1969
Spring 1970	March 30, 1970	February 20, 1970
Summer 1970	June 18, 1970	May 22, 1970

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 non-resident 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 non-resident 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 Non-Resident Fee Exemption" available from that Office. The Director's reviewed decision will be communicated in writing to the student. A student may appeal his classification by requesting 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.

Guidelines

In making a determination of Ohio residency, the following guidelines will be

observed by the University officials: (These guidelines have been recommended by the Ohio Board of Regents and adopted by the Youngstown State University Board of Trustees. They are subject to change by the University at any time. Any subsequent changes to these guidelines will supersede those shown in this catalog.)

1. An adult student, 21 years of age or older, is considered to be an Ohio resident if he has resided in the state for a minimum of twelve consecutive months preceding the date of enrollment, or if he is gainfully employed and residing in the State of Ohio and pursuing a part-time program of instruction and there is reason to believe that he did not enter the state from another state for the primary purpose of enrolling in an Ohio public institution of higher education.

2. A minor student under 21 years of age is considered to be an Ohio resident if his parents or his legal guardian have resided in Ohio for a minimum of twelve consecutive months preceding enrollment, or if the parents or legal guardian are residing in Ohio and if at least one parent or guardian is gainfully employed in Ohio.

3. An emancipated minor under 21 years of age may be considered as an adult student in determining residence, provided such minor presents satisfactory evidence that his parents, if living, do not contribute to his support and do not claim him as a dependent for federal government income tax purposes.

4. The residency of a married woman is determined by the rule which would apply to her husband if he were to seek enrollment; except that a woman who would have been classified as an Ohio resident immediately prior to her marriage may continue to be classified as an Ohio resident if she continues to live in the state.

5. A student classified as a non-resident of Ohio shall not be reclassified as a resident during his continued period of enrollment unless he satisfies the conditions of items 1 or 2 above.

6. A student classified as a resident of Ohio shall be considered to have lost his status after he, or in the case of a minor, his parents or legal guardian move their legal residence to another state.

7. Persons in military service who entered such service as residents of Ohio and their dependents shall be considered residents if they provide proof of continued Ohio domicile or of continuous voting in Ohio.

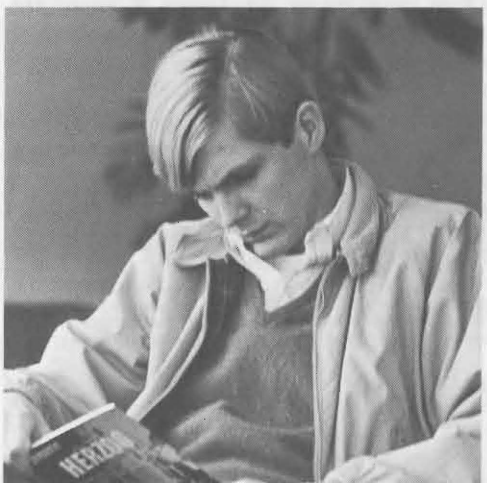
8. Persons in military service and their dependents shall be considered to be Ohio residents during the period when the actual duty assignment is in Ohio and they actually reside in Ohio.

9. Aliens holding immigrant visas may establish Ohio residency in the same manner as citizens of the United States. Alien students admitted to the United States on student visas or other visas shall be classified as non-resident students.

NEW FRESHMEN APPLICANTS

To be admitted to the University, applicants must have graduated and completed 16 units of high school study.* Those who have not completed one or more of the pre-college courses may be admitted with the understanding that these courses will be completed as soon as possible and not later than the end of their sophomore year. Students working toward an Associate Degree must complete any deficiencies before technical courses are started.

* For required high school courses, see the Condensed Table of Courses Required for Graduation, further on in this section.



G.E.D.

Applicants who did not graduate from high school will be considered for admission if they have passed the high school level General Education Development test.

Entrance Tests

All new freshmen are required to take either the American College Test (ACT) or the Scholastic Aptitude Test (SAT) as soon as possible.** Applicants who have been accepted must take one of the tests before registration is permitted. Failure to take one of the tests will result in postponing admission to a later quarter.

High School Transcripts

Applicants must arrange to have their high school send the Admissions Office a record of all work completed. Partial transcripts will be given consideration for early decisions. If the applicant's record clearly indicates satisfactory completion, 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

Unrestricted Admission—an Ohio resident must have completed the required 16 units for graduation from high school and be ranked in the upper two-thirds of the class at graduation.

Restricted or Deferred Admission—an Ohio resident in the lower third of the class at graduation may be required to enroll in a restricted or limited program, or be deferred to a later quarter, as determined by the Admissions Office. However, if the applicant receives a standard entrance examination score equal to or above the current Youngstown State University mean score, he may be given consideration for unrestricted admission.

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 POST-GRADUATE APPLICANTS

An applicant who has been enrolled in another college or university and has been registered for at least one course, is classified a transfer applicant. This classification includes post-graduate applicants from other institutions seeking additional undergraduate course work. Between term transfers are not permitted unless all final and complete records are in the Admissions Office at least two weeks before the quarter begins.

Transcripts

All transfer applicants are required to have two copies of their high school and two copies of all undergraduate transcripts sent directly from the institutions attended to the Youngstown State University 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 better (on a 4.0 system) on all courses taken at other colleges or universities, are usually admitted without restriction. (The requirement for the School of Education 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 one calendar year following the term in which the

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

suspension occurred. Applicants who attend any institution during a suspension period will not receive credit for such work completed during the suspension period.

Out-of-State Residents

Applicants who are non-residents 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

Transfer credit is usually given for course work taken at an accredited college or university provided that a grade of "C" or better is earned and that the course is applicable to the student's degree program at this University. If the student wishes to receive his degree from Youngstown State University he will be required to complete the last 45 quarter hours at this University.

Transfer From A Community College

Applicants wishing to transfer from a community or junior college are considered on the same basis as other transfer applicants.

Transfer of credit from a community or junior college which is not yet fully accredited by one of the Regional Accrediting Institutions will be on a provisional basis. Official validation of credit will not occur until the satisfactory completion of one year at this University.

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

Students who have interrupted their attendance at Youngstown State University for longer than one quarter must make application for re-admission and pay a $5.00 readmission fee.

A former student who was academically suspended is ordinarily not eligible for readmission until the lapse of one year following his suspension and then only after his request for reinstatement has been approved by the dean of the school from which he was suspended, or, in the event he wishes to change schools, from the dean of the school he wishes to enter. The dean will notify the Admissions Office of the action he has taken. The request for reinstatement may be made at any time and the application for readmission must be submitted to the Admissions Office by the announced closing date for the quarter in which the student wishes to re-enter. (For this closing date see the academic calendar in the front pages of the catalog.) Reinstatement procedures vary from school to school; for details consult the secretary in the appropriate dean's office.

GRADUATE APPLICANTS

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

FOREIGN STUDENT APPLICANTS

Residents of foreign countries who wish to enter the University must apply at least six (6) months in advance of the quarter they wish to attend. Upon request for an application by a resident of a foreign country, the applicant will automatically receive a handbook for international students which provides detailed information regarding requirements and procedures.

SPECIAL, NON-DEGREE APPLICANTS

An applicant who does not intend to work for a degree may be considered for admission if he can present evidence of ability to do University level work. An applicant admitted as a Special Student can take only a limited amount of course work. All course work completed as a Special Student is usually taken without University credit.

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 providing 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 nine (9) 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 the work taken under the Advanced Placement program and the Educational Testing Service. A student who has satisfactorily completed an Advanced Placement program in high school and has taken the Advanced Placement test administered by the Educational Testing Service 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

Every student is entitled to one copy of the University Catalog at the time of his entrance. This shall be a guide to his graduation requirements with certain exceptions which are to be interpreted by his Department Chairman and/or the Dean of the School from which he expects to graduate. (See statements later in this section under Major and Minors.)

A general requirement is one that must normally be met by all students, unless exceptions are established. Most general requirements apply only to degrees; a few apply to both degrees and titles.

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 B.A.*	B.E.*	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
A foreign language[2]	2	2[3]	—	—	—	—	—
U.S. history and civics	1	1	1	1	1	1	1
Algebra[4]	1—2[5]	1—2[5]	—	2	2[5]	—	—
Geometry[4]	1—2[5]	1—2[5]	—	—	1	—	—
Biology, chemistry, or physics[4]	1	1	—	—	1[6]	—	—
Any mathematics[4]	—	—	1	—	—	1	1[10]
Any science or additional mathematics[4]	—	—	1	1	—	—	—
Any science[4]	—	—	—	—	—	1	—
Total of above units	9 or 10	9 or 10	6	7	8	6	5
Other subjects[7]	8–10	8–10	10	9	8[8]	10[9]	11
Total high school units	16	16	16	16	16	16	16
IN THE UNIVERSITY							
GENERAL							
Basic	(These figures mean quarter hours of credit.)						
Communication	12	12	12	12	12	12	9
Health and Physical Education	9	9	9	9	9	9	6
Area							
Social Studies	18	18	18	18	18	18	9
Philosophy and Religion[11]	4	4	4	4	4	4	—
FOR THE DEGREE[12]							
Laboratory science[13]	12	Included in the major	—	—	27	—	—
Science or mathematics	4 or 5		14 or 17[14]	14[14]	27	9	5
Foreign language[15]	8 or 20	8 or 20	—	—	—	—[16]	—
English	6	—	6	6	3	3	—
Psychology	4	—	4	4	—	4[17]	—
Other courses[18]	110 or 111	108	125	122	117	149	70
Total credit hours	189	205	192	189	217	208	99[20]

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 B.A., Bachelor of Science in Business Administration; B.E., Bachelor of Engineering; 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.

[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 is a registered nurse or 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 or physics department without University course-credit, or he may make it up

in any other way acceptable to the department concerned.

[5] One unit is enough except for a major in chemistry, earth science, engineering, mathematics, or physics, for a major in pre-medical or allied sciences, or for a minor in mathematics or physics. Such fields require Mathematics 551, 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] For the A.A.S., the desired mathematics courses are algebra and geometry and a unit of science.

[11] Any course in the Philosophy and Religious Studies Department, or Humanities 830, 831 or 832. Students working toward a high school teaching certificate must take 9 hours in the Philosophy and Religious studies department or a total of 9 quarter hours in philosophy and fine arts.

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

[13] All twelve hours to be completed in *one* of the following departments: Biology, Chemistry, Geology, or Physics.

[14] Candidates for the B.S. in Ed. in elementary education are required to take 12 hours of science (6 physical, 6 biological), plus 5 hours of mathematics: this is the minimum set by the State Department of Education. Candidates for the B.S. in Ed. in secondary education and in special education, and for the B.S. in B.A., are required to take 14 hours, 9 of which must be in science. The mathematics for the B.S. in B.A. may be Mathematics 531, or 542, or Merchandising 621, as specified by the various curriculums.

[15] If this requirement is met with a language not previously studied, 20 quarter hours are needed. For Latin and Greek 18 quarter hours are required. Students entering with two units of Latin or Greek may satisfy the requirement by taking 9 quarter hours at the intermediate level.

[16] For voice majors 27 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 18 hours are required (nine hours in each of the two languages not previously studied).

[17] For the major in music education 9 hours are required.

[18] 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.

[19] For the B.S. in B.A. this total is a few hours higher in some fields of specialization; for example, accounting, financial management, industrial management, and public administration total 205 each; general administration, commercial art, and transportation management total 197 each. For the Mus.B. the total varies from 207 for the theory and composition major to 217 for the voice major. For the B.S. in Ed. the total may be reduced to 190 quarter hours if the student is exempted from taking Education 502.

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

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

Application. An application for graduation must be filed with the Recorder. Forms for this purpose are available at the Records Office. Candidacy must be approved and the graduation fee paid on or before March 1 for spring graduation, and on or before July 1 for summer graduation. (See *Special Fees*, further on in this section.) If the student does not graduate at the commencement exercise for which he has filed an application, he must reactivate his application in line with the above dates when he plans to graduate.

Residence. The last 45 quarter hours leading to the 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 Dean of the University.

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 an associate degree, the requirements of each curriculum as shown in the Technical and Community College must be fulfilled. Substitutions of military training or Miltary Science courses for Physical Education courses may be made when properly approved.

For a bachelor's degree, the following requirements must be also fulfilled:

Upper Division Status. The student is not a candidate for a degree until he has been admitted to the Upper Division of the University (see *Candidacy for a Degree*, further on in this section). To achieve this, he must first have *made up any deficiency in high school units* for the desired degree. 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 student 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.

Major 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. (See Social Science Combined Major.)

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 adviser 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 applies for admission to the Upper Division, 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.

GENERAL COURSE REQUIREMENTS: BASIC

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

Communication. The candidate must show satisfactory proficiency in the use and understanding of the English language. The Director of the Division of Language and Literature is the judge of this proficiency. Ordinarily he will grant a certificate to a student who has received a grade of C or higher in the final quarter of his required course in communication or its equivalent.

This requirement is normally met by taking Communication 505–506–507–508, totaling twelve quarter hours. A student who has had part or all of some other "freshman English" course, either at this institution or elsewhere, should consult the Director of the Division of Language and Literature before registering at Youngstown State University.

Health and Physical Education. Each candidate must normally have nine quarter

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

hours of credit in health and physical education. Usually this consists of three quarter hours of health education (Health and Physical Education 509M, 509W or 509C), and six 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 509M (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.

Orientation. Every candidate must have one quarter hour for Orientation 500.

GENERAL COURSE REQUIREMENTS: AREA

In addition to the basic course-requirements, there are the following general requirements in particular *areas* of study:

Social Studies. The candidate must have 18 quarter hours in the social sciences, except for the Bachelor of Engineering degree, for which the requirement is 12 quarter hours.

Normally he must meet this requirement by taking Social Science 501, 502, 503 and History 601, 602, 603 (except for engineering students, who take only one 600-level history course, and sacred music majors, who substitute History 651, 652, 653 for 601, 602, 603). However, a transfer student with less than 96 but more than 48 quarter hours acquired elsewhere may omit Social Science 501, 502, 503, and a transfer student with 96 or more quarter hours acquired elsewhere may omit all six courses, provided his credits include 18 hours in the social sciences at the time he graduates.

Philosophy. The candidate must have completed either a four-quarter-hour course in the Department of Philosophy and Religious Studies, or Humanities 830, 831, or 832.

Science. There is a requirement in this area for every degree, but there is considerable variation among the several degrees in the choice of courses allowed and in the rigor of the technical approach to the subject. The relevant details are therefore stated in the section pertaining to the particular degree.

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.), *Bachelor of Science* (B.S.), and *Bachelor of Science in Education* (B.S. in Ed.) are stated in the College of Arts and Sciences section. Those for the *Bachelor of Arts and Bachelor of Science in Education* degrees are repeated 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.

MODIFICATIONS FOR R.O.T.C. STUDENTS

R.O.T.C. students may have certain courses waived, as follows:

a. Students completing Military Science 501, 502, 503 and 601, 602, 603, may omit six quarter hours in health and physical education ACTIVITY courses. Such students may also omit Social Science 503 (3 quarter hours).

b. Students completing Military Science 701, 702, 703, 704 and 801, 802, 803 and working toward any degree may omit Psychology 601 (except as a prerequisite to other courses) and three other quarter hours to be determined in consultation with their adviser. For the degrees of Bachelor of Arts, Bachelor of Science in Business Administration, and Bachelor of Science in Education, the course thus omitted may be five quarter hours of science, provided that the candidate for the Bachelor of Arts completes twelve quarter hours in *one* of the following departments: biology, chemistry, geology, or physics.

Unless specifically provided for above, no course required for the degree sought may be waived. Additional credits for military science courses may be applied in the same way that credits for other elective courses are applied.

REQUIREMENTS FOR A SECOND UNDERGRADUATE 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.

A student who has a degree from another institution and desires a degree from Youngstown State University must complete a minimum of 45 quarter hours, 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 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.

COMMENCEMENT EXERCISES

There are two graduation ceremonies each 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 first or second quarter receives his diploma in June and is present, if at all possible, at Spring Commencement as a member of the graduating class.

GENERAL REGULATIONS

SCHEDULING OF COURSES: ADVISEMENT

A student already attending the University makes out his schedule of courses for the next quarter in consultation with a faculty adviser who must sign the student's schedule, even when a prescribed curriculum leaves him no actual choice of courses.

A student entering for the first time, or a former student wishing to re-enter, gets instructions for scheduling and advisement at the Registrar's Office.

The student planning his program should understand that some courses are not offered every term. Those offered in a particular quarter or summer session, with their times and places, can be ascertained from the *Schedule of Classes* for that term, which is published in time for use in advisement and scheduling for the term in question. For information about future offerings, or when a particular course will be offered again, the student may consult the dean of the unit concerned, or the department chairman.

Although the University tries, through its advisement system, to insure the student's taking all the courses needed for his degree, *the ultimate responsibility for meeting any requirement rests with the student himself.* He will do well to read the statements under *Candidacy for a Degree,* further on in this section.

THE CLASS HOUR, QUARTER HOUR, and QUARTER HOUR OF CREDIT

The *class hour** is a weekly 50-minute class period and is the basic unit of instruction. The term *quarter hour** signifies one class hour a week carried for one 11-week quarter (or the equivalent in a summer term). A *quarter hour of credit** is the amount of credit given for one quarter hour successfully completed. *Each* quarter hour of credit represents *three hours of study and instruction* every week through the quarter.

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

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* 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 practicable form.

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 a 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 adviser's approval, which ordinarily is given.

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 adviser 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 Orientation 500 and the general-requirement activity courses in health and physical education.

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

The form for an overload request is available at the Registrar's Office. After grades for the preceding term are reported, a dean may reduce the schedule of any student in his unit whose record is poor.

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 teacher.

3. Such extra work is done only under the supervision of a full-time teacher.

4. The extra credit may not exceed one hour for each course or one course each quarter.

5. An application form must include the signatures of the teacher and the department chairman, and receive the approval of the Dean of the appropriate school.

AUDITORS

A student may register for and attend any course as an auditor. An auditor is not held responsible for the regular classwork and preparation of assignments and receives no credit for the course. However, he pays the regular fees for the course, as well as any other applicable fees, and it is counted in his load. A student who has registered for a course for credit may not change his status to that of auditor after four weeks of a regular quarter or two weeks of a summer session have elapsed. (An auditor is not to be confused with a special student; see *Special Students,* at the beginning of this section.)

REGISTRATION

Every student registers in person for the work of each session on or before a final registration date. One who has begun his registration before the deadline may complete it late, but must likewise pay a fee. There is no reduction of tuition or other fees because of late entrance into courses.

No student may enter a course after the first meeting of the second week of a quarter or after the fifth calendar day of a summer term.

FRESHMAN DAYS

The Freshman Days program is held the last three days of the week preceding upper-class registration. It is designed to help the new student adapt himself to his new surroundings and

activities. During the first two days entering freshmen are required to attend the Orientation sessions and to complete their final registration.

CHANGE OF REGISTRATION

A student wishing to alter his schedule after registration must fill out a Change of Registration form, have it signed by his adviser, and present it to the Student Accounts Office for approval and acceptance. A mark of W is recorded for a course dropped without this procedure, since such withdrawal is not official.

Anyone changing his registration after the registration period pays a fee, unless the administration has requested the change.

FULL-TIME STATUS

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

CLASS RANK

All students working for any undergraduate degree conferred by this University are ranked as Freshmen until they have completed 48 quarter hours, as a Sophomore until they have completed 96 quarter hours, as a Junior until they have completed 144 quarter hours, and as a Senior thereafter.

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.

No freshmen may 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. A senior taking a 500-level course will receive only two-thirds of the normal credit for it, unless the chairman of his major department and the Vice-President for Academic Affairs waive the rule.

CANDIDACY FOR A DEGREE: ADMISSION TO THE UPPER DIVISION

A student who wants to become a candidate for a baccalaureate degree from Youngstown State University must file with the Records Office an application for admission to the Upper Division. This application must be filed when the student has completed 72 to 96 quarter hours. A transfer student with 45 or more semester hours or 68 or more quarter hours must file such an application when he applies for admission to Youngstown State University. The student is admitted to the Upper Division upon approval of his application and completion of 96 quarter hours. Until admitted to the Upper Division, no student may be given junior or senior class standing or be considered a candidate for a degree.

His application form must indicate:

1. The degree for which he is a candidate. He may thereafter change his degree objective only by filing a new application for admission to the Upper Division as a candidate for the new degree.

2. Pertinent to the degree sought, his completion of

(a) all pre-college requirements;

(b) the Communication and English requirements through Communication 508;

(c) the laboratory science requirement;

(d) a total of 72 to 96 quarter hours of credit, *not including courses taken to meet any pre-college requirement.*

3. His major subject, with the signed approval thereof by the chairman of the major department. He may thereafter change his major only by formal application to the Dean of the appropriate school and with the approval of the chairmen of both the old and new major departments.

GRADING SYSTEM

The 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 dropping a course without officially withdrawing from it (see *Withdrawals and Refunds,* further on in this section), or from cheating or dishonesty of any kind in a course (see *Academic Honesty,* below).

The 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* 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 the course.

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. The former *E* grade has now been discontinued.

A progressive 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 and second quarters. This grade is changed at the end of the third quarter. It has no effect on the point average.

Aud signifies that the student has attended the class as an auditor. This mark may be given only to a student who has begun a course as an auditor or who has changed his status to that of auditor before four weeks of a regular quarter or two weeks of a summer session have elapsed.

W represents withdrawals properly processed during the first six weeks of any quarter (or first three weeks of either split summer session). A withdrawal made after the three-to-six week period will be recorded as an F unless the withdrawal was the result of circumstances over which the student had no control, as shown by evidence presented by the student in a petition to the appropriate dean. Any grade of F assigned because of absence may be reviewed upon petition to the appropriate dean.

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 notified (draft boards, scholarship or loan-supporting agencies, etc.)

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. How-

ever, 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.

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 get an honorable and rewarding education, the Faculty-Student Discipline Committee attempts to discourage cheating and plagiarizing by imposing penalties if either one occurs.

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 teacher and/or the Committee.

The teacher may fail any student for cheating in his course. The teacher files a report on such action with the Committee, so that the offense becomes a matter of record in the Committee files. The student may appeal the matter to the Committee if he wants to.

Certain offenses, however, may warrant action beyond receiving an *F* in the course. Such offenses as the following are grounds for expulsion:

1. Using a textbook or crib notes to cheat during an examination.
2. Possessing an examination without the teacher's knowledge or authority.
3. Plagiarizing in any way.
4. Defacing library books or damaging any other University property.

Procedure for reporting, investigating, and handling such violations is prescribed by the Faculty-Student Discipline Committee and available in the office of the Academic Vice-President of the University.

Further details concerning such violations are given in the *Student Handbook.*

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.

THE POINT INDEX AND SCHOLASTIC STANDING

The student's scholastic standing is indicated by his point index (also called "grade average"). For determining this, every grade has a point value for each quarter hour it represents, as follows: A, 4 points; B, 3 points; C, 2 points; D, 1 point; F, E, or WF, no points. For example, an A in a 3-hour course is worth 12 points; a D in a 4-hour course, 4 points; and an F or WF in any course, no points. To find the point index, the total number of 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 points has a point index of 2.50. The grades of Aud, PR, and WP, and grades for courses that give no credit toward graduation, are not included in the calculation of the point index. (See also *Repetition of Courses,* further on in this section.)

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, which means an unspecified period of separation from the University, assumes the possibility of a greater maturity which will increase the student's judgment and responsibility, qualities which should improve his capacity for academic achievement.

Recognizing that the transition from high school to college may be a difficult one, the college 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 the degree of Bachelor of Engineering must maintain a point index of 2.00 or higher at all times; see the section on the William Rayen School of Engineering.

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.

GRADE REPORTS

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

THE DEAN'S LIST

The Dean's List for each quarter is made up of undergraduates who earn a quality point average of 3.4 in that quarter. It is not made up for the summer session.

CLASS HONORS

Class Honors are determined through a formula applied to the accumulated point averages based on the most recently completed quarter. The number of Honors recipients approximates the top one percent of the total enrollment of each class in each unit of the University, but it may slightly exceed this figure because of ties. Both full-time and part-time students are included, but only stu-

dents who have not yet taken a degree are eligible, and a person may receive such honors only once at each class rank.

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 the awards listed under *Awards and Prizes* in the General Information section are announced.

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.*

Transfer students with 90 quarter hours of credit are eligible for graduation honors, but 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.

REPETITION OF COURSES

A student may repeat a course once. If the course repeated is prerequisite to another course, the repetition must be successfully completed before the other course is taken. No course may 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. A course repeated, however, may be counted only once for university credit.

ABSENCE FROM CLASSES AND EXAMINATIONS

A student must have the teacher's consent in order to take any examination at a time other than the scheduled one. The teacher, 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 presents there a permit signed by the teacher. Permit forms are available at the unit dean's or the Registrar's office.

HONORABLE DISMISSAL

A transcript of credits serves as a statement of honorable dismissal except when such a statement is not merited. A transcript indicates whether a student is withdrawing in good standing and shows any disciplinary action he may have incurred while attending Youngstown State University. No transcript is issued to a student who has not met all his financial obligations both to the University and to recognized campus organizations.

If a separate 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. A statement of dismissal issued with any of these conditions unmet may be expected to include an explanation of the circumstances.

FEES AND EXPENSES

All fees are due as indicated in the University calendar, published in the Bulletin, "Schedule of Classes." A student is not officially enrolled and may not attend classes until he has completed his registration by paying his fees. Before

STUDENT FEES AND TUITION EFFECTIVE SUMMER QUARTER, 1968*

	For students enrolled during Spring Quarter of 1968 Per Quarter	For students enrolled after Summer Quarter of 1968 Per Quarter
FOR FULL-TIME STUDENTS (12–17 quarter hours)		
Instructional Fee	$120.00	$120.00
Student Services Fee (Comprehensive)	30.00	30.00
Non-Resident Tuition Surcharge	75.00	125.00
Charges per Quarter Hour above 17 hours:		
Instructional Fee	12.00	12.00
Non-Resident Tuition Surcharge	10.00	16.00
FOR PART-TIME STUDENTS (Below 12 quarter hours)		
Instructional Fee per Quarter Hour	12.00	12.00
Student Services Fee (Comprehensive)	10.00	10.00
Non-Resident Tuition Surcharge per Quarter Hour	10.00	16.00
FOR STUDENTS (FULL-TIME) IN THE DANA SCHOOL OF MUSIC (12–17 quarter hours)		
Instructional Fee	$120.00	$120.00
Student Services Fee (Comprehensive)	30.00	30.00
Music Fee	75.00	75.00
Non-Resident Tuition Surcharge	75.00	125.00
Charges per Quarter Hour above 17 hours:		
Instructional Fee	12.00	12.00
Non-Resident Tuition Surcharge	10.00	16.00
FOR STUDENTS (PART-TIME) IN THE DANA SCHOOL OF MUSIC (Below 12 quarter hours)		
Instructional Fee per Quarter Hour	12.00	12.00
Student Services Fee (Comprehensive)	10.00	10.00
Applied Music Fee per Quarter Hour	40.00	40.00
Non-Resident Tuition Surcharge per Quarter Hour	10.00	16.00

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

seeking admission to the University, students should have a definite plan and source of income for financing college studies. Students may seek financial aid offered at the University.

A student may not complete registration for a new term until he has paid all of his previous fees. Graduation and transcript of credits will be withheld until the student has met all his financial obligations to the University.

Recipients of scholarships or financial aid for the full amount of their tuition are not officially enrolled and may not attend classes until they have indicated their intention to attend by returning their payment notice by the due date.

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 in the specific case.

Special 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 and is effective only for the quarter for which the student applies.

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.

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 cut-off 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. (Note: The late payment fee will also be assessed to those students receiving financial aid who have not returned their payment notice by the due date indicating that they plan to attend.)

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.

Change of Registration Fee. A fee of $2.00 is charged anyone changing his registration unless he does so at the request of the administration, or completely withdraws from the University. Appeals will be subject to the supervision of the Finance Committee. (Note: 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 a $5.00 late fee.

Registration Withdrawal Fee. A fee of $5.00 is charged when a student withdraws from all his courses, and the terms under Withdrawals and Refunds (further on in this section) are waived by the Business Office.

Reinstatement Fee. A fee of $5.00 is charged anyone readmitted to classes after suspension for financial reasons.

Special Check-Handling 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 the returned check fee, draw a late registration fee. If these penalties are not paid within four days of notice to the student, he shall be suspended from classes.

Fee 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.

Fee for Proficiency Examination. 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.

Fee for Irregular Examination. 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.

Graduate Record Examination Fee. Three kinds of Graduate record examinations are administered: a general aptitude test; area tests in social science, humanities, and natural science; and advanced tests in

twenty-one fields. Individual departments specify which must be taken. The fee for one is $2.50; for two $4.50; for three $6.00.

Graduation Fee. a fee of $20.00 is charged anyone who is to receive a degree or title. The fee, which includes cap and gown rental, diploma, and which helps to defray the general expense attendant to the commencement exercises, must be paid at the time the official application for graduation is submitted to the Recorder. 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 or title 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.

Transcript of Credits Fee. A fee of $1.00 is charged for each transcript.

Student Locker Fee. A student may be assigned a locker by paying a $1 student locker fee at the cashier's window, Jones Hall, first floor. For further information on lockers see the General Information Section.

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

R.O.T.C. Activity Fee. Every student registered for a course in military science is charged $2.00 each quarter as a special activity fee. This fee provides funds for the annual Military Ball; awards and recognition for meritorious service to the R.O.T.C. in athletics and extra-curricular activities; athletic events and contents; and miscellaneous matters pertinent to the function of the R.O.T.C. Cadet Corps. This fee is non-refundable.

Comprehensive Fee. This fee helps defray the cost of student services and activities such as health services, library, counseling and a portion of parking lot maintenance which is not covered by the parking fee. It also aids in the support of student associations, student government, lecturers, entertainment and extracurricular activities. *Beginning with the first day of classes there can be no reduction or pro-ration of this fee.* This fee is not refundable except for administrative reasons.

Withdrawals and Refunds

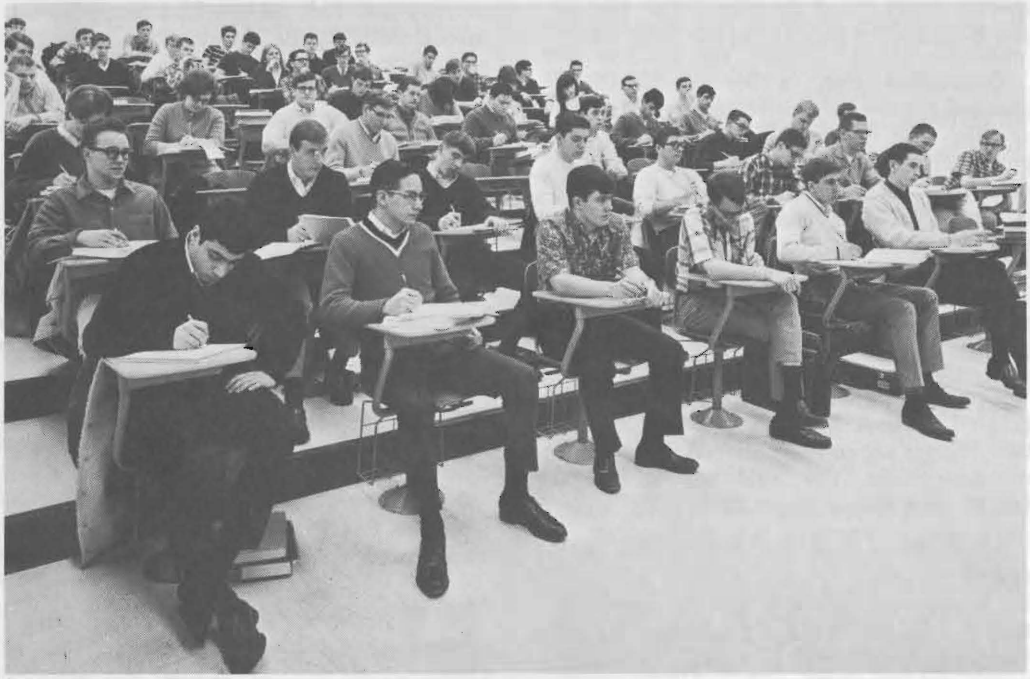
A student may not enroll for less than a full term. If a student withdraws from a course or from the University, he must fill out an official Change of Registration form and present it to the Student Accounts Office. Failure to attend class, or merely notifying the teacher, the Registrar, or some other 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%	

* Figured from opening date of classes.
** Excludes Sunday, for each specified time period.

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 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 Youngstown State University Finance Committee Chairman.

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.

COURSE NUMBERS

Levels. Courses numbered from 500 to 599 are designed primarily for freshmen; 600 to 699, for sophomores; 700 to 799, for juniors; and 800 to 899, for seniors.

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.


Technical & Community
Arts & Sciences
Education B.S. Ed
Engineering B.E.
Business B.S. B.A.
Music B.M.

College of Arts and Sciences

Karl Washburn Dykema, Dean

ORGANIZATION AND DEGREES

Two degrees are granted by 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:

ORGANIZATION AND PROGRAM

Department of Art
Department of Biology and Natural Science
Department of Chemistry
Department of Economics
Department of English, Communication, Humanities and Linguistics
Department of Geography
Department of Geology
Department of Health and Physical Education
Department of History
Department of Home Economics
Department of Mathematics
Department of Military Science
Department of Foreign Languages
Department of Philosophy and Religious Studies
Department of Physics and Astronomy
Department of Political Science and Social Science
Department of Psychology
Department of Sociology
Department of Speech and Dramatics

Courses are also offered in journalism, nursing and criminology.

MAJOR AND MINOR FIELDS

For the A.B. degree. The choice is virtually unlimited within the University's offerings. The major may be in any of the departments listed above (except military science), with French, German, 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, 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 (except secretarial studies).

For the B.S. degree. Pure science majors are possible in biology, chemistry, geology, mathematics, and physics. There are special combinations of sciences for pre-medical and allied fields, and other pre-professional purposes. Combinations of science courses and applied science or technological training are offered as majors in food and nutrition, medical technology, and nursing.

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.

REQUIREMENTS FOR THE 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 briefly 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 189 quarter hours of credit and are designed to be completed in four academic years.* A

* The minimum for the Bachelor of Science degree is sixteen more quarter hours, to permit sufficient specialization without reducing too greatly the student's general education. By attending summer sessions, however, a student may complete any of the curriculum in four years.

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 adviser.

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

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, page 152.

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
Any mathematics	—	—
Biology, chemistry, or physics	1	1
Any science subjects or additional mathematics	—	—

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	189	205**
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		
Communication 505–506–507–508, Basic Course I–II–III–IV	12	12
Health and Physical Education 509M or 509W, Health Education	3	3
Health and Physical Education activity courses	6	6
AREA COURSES		
Social studies:		
Social Science 501, 502, 503, Introduction to the Social Sciences I, II, III	9	9
History 601, 602, 603, The United States	9	9
Philosophy and Religion:		
A course in the Philosophy and Religion department, or Humanities 830, 831, or 832, Older Classics I, II, III	4	4
Science	16 or 17	4 in the major

* One is enough except for a science major needing Mathematics 552, or for a mathematics minor.

** The minimum for the Bachelor of Science degree is sixteen more quarter hours, to permit sufficient specialization without reducing too greatly the student's general education. By attending summer sessions, however, a student may complete any of the curriculums in four years.

† Students working toward a high school teaching certificate must take at least nine quarter hours in the philosophy or fine arts areas, of which at least four must be in the philosophy area.

	A.B.	B.S.
For the A.B. degree: 12 hours of one laboratory science (in the departments of Biology, Chemistry, Geology or Physics) and four or five hours of course work in Astronomy, Biology, Chemistry, Geology, Mathematics, or Physics. Natural Science courses do NOT satisfy this requirement.		
OTHER COURSES		
A foreign language (ancient)	9 or 18	9 or 18
A foreign language (modern) — For the A.B. and B.S. degrees: the requirement is such a knowledge of the foreign language and its literature as required 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 his high school language courses and the language that he chooses in college. *See Proficiency in a Foreign Language,* below. For the B.S. degree: the language chosen must have the approval of the chairman of the major department. Chemistry majors ordinarily must have a reading knowledge of scientific German. No foreign language study is required of registered nurses or medical technology majors. See also *Proficiency in a Foreign Language,* below.	8 or 20	8 or 20
English — Any 600 level literature course or courses (including Humanities 631) and/or any other Humanities course or courses.	6	—
Psychology 601, General Psychology	4	—
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. Except toward the A.B. degree, however, most science and education curriculums allow comparatively little choice of courses.	110 or 111	108
Teacher-training courses (high school) — Education 501, Introduction to Education; 704, Student Teaching Laboratory: High School and Special Field; 706, Principles of Teaching; 708, Educational Sociology; 800, Special Methods; and 842, Supervised Student Teaching: High School and Special Field; and Psychology 709, Educational Psychology. These courses are required for B.S. in Ed. students preparing to teach in high school and also for A.B. or B.S. students preparing to teach in high school	— 36*	— 36*

* This includes Education 502.

COMBINED LIBERAL ARTS-PROFESSIONAL COURSE: MEDICAL STUDENTS

A student who has completed at least 152 hours toward the degree of Bachelor of Arts (or 169 hours toward the degree of Bachelor of Science) and has satisfied all requirements for the degree except the completion of the total number of quarter hours required and the completion of a major, will be granted the

degree of Bachelor of Arts (or Bachelor of Science) on the satisfactory completion of the remaining number of quarter hours at any professional school granting the degree of Doctor of Osteopathy, Doctor of Dental Surgery, Doctor of Medicine, or Doctor of Veterinary Medicine and approved by the accrediting agency of that profession, provided that he has been accepted for further study at the professional school. The student may satisfy his major requirement by utilizing the credit accepted for professional study toward a combined major in pre-professional sciences. He may thus secure the Bachelor of Arts or Bachelor of Science degree after from three to three and a half years in the University followed by approximately a year in the professional school of his choice.

PROFICIENCY IN A FOREIGN LANGUAGE

The student's proficiency in a foreign language is determined by a faculty committee. This committee has ruled that the only languages which meet degree requirements are those listed in the *Courses of Instruction* section that follows.

For the Bachelor of Arts degree, four high school units, if 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 requirement by taking one, or in some cases two, of the University courses in that language numbered 601, 602, 603; as for which one or two, he should consult the chairman of the Foreign Language Department. 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 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, the same rules apply, but the language must be one that meets the approval of the chairman of the department in which the student is majoring. A student majoring in chemistry who intends to meet this requirement with German and does not take German 611 and 612 (Scientific German) must pass an examination in scientific German.

The knowledge of the foreign language and its literature for either degree does not have to be the result of enrollment in classes; it may have been acquired in any way whatsoever. However, in the absence of credit for high school or college courses as stated above, the student must pass an examination in order to be certified.**

Students may enroll (for review purposes, for example) in a foreign language course even if it duplicates a high school course already taken. Ordinarily, however, a student cannot be given credit for a foreign language course that duplicates a high school course unless the high school course was an extra unit beyond the 16 units of entrance credit required for admission to the University. For example, if a student has completed both two years of high school Latin and two years of high school French and has a total of 18 high school units, he may take all of either French 501–502–503 or Latin 501–502–503 for credit; or if he has a total of 17 units, he may take two quarters of either course for credit.

Students desiring to take a proficiency examination must first complete a petition form available in the office of the Department of Foreign Languages.

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* 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.

** In such a case the student satisfies the requirement for the degree but receives no course credit. If he wishes, he may be given as many as 9 quarter hours by paying the Fee for Credit by Equivalency or Examination (see **Special Fees**).

COURSES OF INSTRUCTION AND CURRICULUMS†

AMERICAN STUDIES

Professor W. Miner (supervisor)

The program for the combined major in American studies aims, in general terms, to provide a focus for a liberal education. Thus it can be used for almost any pre-professional training. The values of a good liberal education should be obvious to the individual planning on future graduate work in any of the humanities or the social sciences. The student expecting to enter foreign service will find this program particularly appropriate 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.

A. Required courses:
   1. History 651, 652, and 653.
   2. English 605, 606, and 607.
   3. A foreign "civilization" course (such as French 750).
   4. Geography 718.
   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, 755 or 756.
      c. Humanities 833, 834 or 835.
      d. Philosophy 713, 714, 749, 811, 812 or 820.
      e. Art 707, 709, 710 or 711.
   2. American history (Upper Division).
   3. Sociology, anthropology, and economics
      a. Sociology 600, 610, 611, 716, 717, 759 or 760.
      b. Economics 601, 602, 603, 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 Course

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.

ANCIENT LANGUAGES AND LITERATURE

See *Classical Studies* and *Hebrew.*

ANTHROPOLOGY

See *Sociology.*

ART

Professor Naberezny (chairman); Associate Professor Ives; Assistant Professors Babisch, Bright, Juhasz, Lepore, Lucas, Maddick, Mitchell, and Walusis.

The art department offers courses leading to the degrees of Bachelor of Arts with a major in art or in commercial art, and the Bachelor of Science in Education with a major in art.

For the Bachelor of Arts degree, the major is a minimum of 46 credits, of which at least 18 are to be in art history. In addition, electives are suggested that will better qualify the student to pursue advanced studies in art or art history.

For the Bachelor of Science in Education degree, a minimum of 67 credits is required, of which at least 18 are to be in art history. After completing two years of satisfactory study, the student going into education may apply for admission to the School of Education. (The requirements for admission are listed under the School of Education section.)

A student wishing to acquire a major in art which will qualify him for high school teaching only will find a suggested list of art courses under curriculums which appears below. Education requirements for this major will be found under the School of Education section.

† 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.

A student in education desiring a minor in art must take the following courses: Art 510, 511, 513, 514, 601 or 602, 605, 606, 722, 724, 725, and two upper division studio electives.

Lower Division Courses

510. *Color and Design.* Two dimensional experiments with various kinds of materials and media. A study of the formal elements and their present-day relationships. 3 q.h.

511. *Color and Design.* Three dimensional experiments with various kinds of materials. Utilization of the formal elements in three dimensional design. 3 q.h.

512. *Studio Problems.* Applying disciplines of two and three dimensional design to actual problems. Prereq.: Art 510, 511. 3 q.h.

513, 514. *Survey of Art.* Lectures on what constitutes art, the plastic means, and the relationship of parts. Attention is given to historical developments, influences, and experiments. A survey of art from prehistoric periods to the present. 3 + 3 q.h.

601, 602. *Drawing.* Experience in drawing from the figure. Attention to the significance of line, the relation of shapes and their organization in established space. 3 + 3 q.h.

605. *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.

606. *Beginning Painting.* 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 602. 3 q.h.

607. *Introduction to Art, Art Education.* Contemporary trends in all aspects of art: intensification of personal sensitivity to significant qualities common to painting, architecture, clothing, interior design, industrial design, and other types of plastic and pictorial art through the use of museums, lectures, field trips, visual aids and classroom experiences. Required of all elementary education majors. 2 q.h.

611, 612, 613. *Printmaking.* Experimenting with all kinds of printing media. Block printing, silk screen techniques, stone, and various metals used for printing. Prereq.: Art 510. 3 + 3 + 3 q.h.

623. *Advertising Art I.* Practice with all types of lettering and illustration which apply to commercial advertising. Prerequisite or concurrent: Art 510. 3 q.h.

624, 625. *Advertising Art II.* Applying lettering, illustration, and the principles of art to layouts; reproductions of silk screens, lino-cuts, and monoprints; study of current trends. Prereq.: Art 623. 3 + 3 q.h.

Upper Division Courses

701. *Seminar.* Discussions on preparations for graduate study; culminating ideas and theories already learned; planning individual exhibits. Prereq.: junior standing. 1 q.h.

703, 704. *Painting.* Continuation of individual exploration of techniques and development of personal tendencies. Prereq.: Art 606. 3 + 3 q.h.

705. *Advanced Drawing.* Study in composition, space division, the plastic means. Prereq.: 601, 602. 3 q.h.

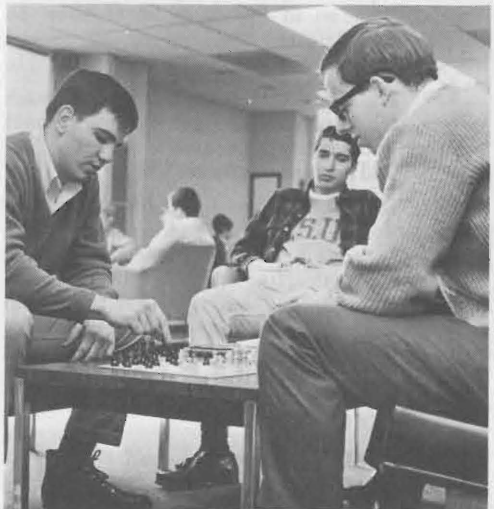
707. *American Art.* Illustrated lectures on the art forms of America from Pre-Colombian to 1900. 3 q.h.

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: 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. Open to all students of the University. No prior training in art or music required. Listed also as Music 709, 710, 711. 3 + 3 + 3 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 through 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 Hellenistic Greece and the Roman world, and their relation to the civilizations in which they were produced and to the classical Greek from which they developed. No previous training in art or ancient languages is required. Listed also as Classical Studies 715. 3 q.h.

716, 717. *Interior Design.* Study of period furnishings, new designs, and textiles. Application of these and experiences from Art 510, 511 to rooms and other interiors. Prereq.: Art 510, 511. Art 716 is prerequisite to 717. 3 + 3 q.h.

718, 719, 720. *Jewelry.* Designing and shaping of various metals. Complete fabrication through hand and casting processes. Prereq.: Art 511. 3 + 3 + 3 q.h.

722. *Arts and Crafts I.* 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 and art education majors. 3 q.h.

723. *School Art Programs.* A study of the needs of children at different age levels and the means of providing desirable art experiences. Objectives and procedures considered from the standpoint of the child's level of development. Children's paintings and drawings evaluated. Required of all elementary education majors. Prereq.: Art 607. 2 q.h.

724. *School Art Programs.* A study of the needs of children at all age levels and the means of providing desirable art experiences. Special attention to the needs of children on the secondary level. Required of all special art students. 3 q.h.

725, 726. *Ceramics.* 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.* 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 623, 624, 625. 3 + 3 + 3 q.h.

730, 731, 732. *Sculpture.* Special problems dealing with form in space. Experience with and treatment of clay, wood, stone, and metal. Prereq.: Art 511. 3 + 3 + 3 q.h.

750, 751. *Architectural Design.* 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. Art 750 is prerequisite to 751. Prereq.: Art 704. 3 + 3 q.h.

801. *Seminar.* Discussions on problems of the prospective teacher which involves plant facilities, tools and supplies. Planning individual exhibits. For students in Art Education only. Prereq.: senior standing. 1 q.h.

803, 804, 805. *Advanced Painting.* Continuation of Painting 704. Prereq.: Art 704. 3 + 3 + 3 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.* Continuation of Art 726. Prereq.: Art 726. 3 q.h.

812. *Advanced Sculpture.* Continuation of Art 732. Prereq.: Art 732. 3 to 5 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.

822. *Arts and Crafts II.* Designing, constructing and decorating in various materials suitable for upper elementary and secondary schools. Organized as a laboratory workshop with emphasis on three dimension expression. Required of all Art Education Majors. Prereq.: Art 722. 3 q.h.

CURRICULUMS

Suggested Curriculum for the Degree of Bachelor of Arts with a Major in Art

First Year	Hrs.
Art 510, 511 Color and Design	6
Art 512 Studio Problems	3
Art 513, 514 Survey of Art	6

Comm. 505–506–507 Basic Course I–II–III	9
*Foreign language (or electives)	12
Soc. Sci. 501, 502, 503 Introduction to the Social Sciences I, II, III	9
H. & P. E. 509M or 509W Health Education	3
	48

Second Year	Hrs.
Art 601, 602 Drawing	6
Art 605 Renaissance Art	3
Art 606 Beginning Painting	3
Art elective (600 level or above)	3
*Foreign language (or electives)	8
History 601, 602, 603 History of the United States	9
H. & P. E. activity courses	3
Psych. 601 General Psychology	4
Comm. 508 Basic Course IV	3
English: any 600-level literature courses	6
	48

Third Year	Hrs.
Art 701 Seminar	1
Art 703 Painting	3
Art 705 Drawing	3
Art 730 or 731 or 732 Sculpture	3
Art History electives	6
Art Studio electives	6
*Science	12
Philosophy and Religion elective or Humanities (upper division)	4
H. & P. E. activity courses	3
Electives (upper division)	8
	49

Fourth Year	Hrs.
Art 814 or 815 Twentieth Century Art	3
Art electives	15
*Mathematics or science	5
Electives (upper division)	22
	45

* Foreign language and science requirements are explained under **Requirements for the Degree** and **Proficiency in a Foreign Language**, near the beginning of the College of Arts and Sciences section.

Required Curriculum Leading to the Degree of Bachelor of Science in Education with a Major in Art and to a Provisional Special Certificate in Art Education

First Year	Hrs.
Art 510, 511 Color and Design	6
Art 512 Studio Problems	3
Art 513, 514 Survey of Art	6
Comm. 505–506–507 Basic Course I–II–III	9
Educ. 501 Introduction to Education	3
Soc. Sci. 501, 502, 503 Introduction to the Social Sciences I, II & III	9
*Science	5
H. & P. E. 509M or 509W Health Education	3
H. & P. E. activity courses	3
Orientation 500	1
	48

Second Year	Hrs.
Art 601, 602 Drawing	6
Art 605 Renaissance Art	3
Art 611, 612 Printmaking	6
Art 606 Beginning Painting	3
Art 623 Advertising Art	3
Comm. 508 Basic Course IV	3
English: any 600-level literature courses	6
History 601, 602, 603	9
Psych. 601 General Psychology	4
Psych.: Psychology of Education	3
H. & P. E. activity courses	3
	49

Third Year	Hrs.
Art 703 Painting	3
Art History elective	3
Art 718 Jewelry	3
Art 722 Arts and Crafts I	3
Art 724 School Arts Program	3
Art 725 Ceramics	3
Art elective	3
Educ. 704 Student Teaching Lab.	3
Educ. 706 Principles of Teaching	3
*Science	10
Electives (Upper Division)	9
	46

Fourth Year	Hrs.
Art 822 Arts and Crafts II	3
Art 750 or 716	3
Art 814 or 815 Twentieth Century Art	3
Art elective	6
Art 730, 731, or 732 Sculpture	3
Art 801 Seminar	1
Art History elective	3
Educ. 843 Supervised Student Teaching	15
Educ. 708 Educational Sociology	3
Philosophy and religion, or Humanities elective	4
Electives (Upper Division)	3
	47

Suggested Curriculum for the Degree of Bachelor of Arts with a Major in Commercial Art and a minor in Advertising

First Year	Hrs.
Art 510, 511 Color and Design	6
Art 513, 514 Survey of Art	6
Art 601 Drawing	3
Comm. 505, 506, 507 Basic course I, II, III	9
*Foreign language (or elective)	9
Soc. Sci. 501, 502, 503	9
H. & P. E. 509M or 509W Health Education	3
H. & P. E. activity courses	3
Orientation 500	1
	49

Second Year	Hrs.
Art 623 Advertising Art I	3
Art 624 Advertising Art II	3
Advertising 627, 628, 629	9
Comm. 508 Basic course IV	3
English: any 600-level literature courses	3
*Foreign language (or elective)	9

History 601, 602, 603 The United States	9
H. & P. E. activity courses	3
Psych. 601 General Psychology	4
	46

Third Year	Hrs.
Art 625 Advertising Art II	3
Art 727, 728, 729 Advertising Art Advanced	9
Art 703 Painting	3
Art 705 Drawing	3
Art 716, 717 Interior Design	6
**Advertising 729, 730, 731	9
*Science	12
Philosophy and Religion elective (upper division)	4
	49

Fourth Year	Hrs.
Art 704 Painting	3
Art 725 Ceramics	3
Art 718, 719, 720 Jewelry	3
Art 750 Architectural Design	3
Art History electives	6
*Mathematics or science	5
English: any upper division literature course	3
**Advertising 801, 815	6
Electives (upper division)	14
	46

* Foreign language and Science requirements are explained under **Requirements for the Degree and Proficiency in a Foreign Language**, near the beginning of the College of Arts and Sciences section.

** Descriptions of the advertising courses can be found under **Advertising**, in the School of Business Administration section.

Art Curriculum for a Major in Art Leading to the Degree of Bachelor of Science in Education and a Provisional High School Certificate*

Lower Division	Hrs.
510, 511 Color and Design	6
513, 514 Survey of Art	6
601 Drawing	3
611 or 612 Printmaking	3
606 Beginning Painting	3
623 Advertising Art	3
	24

Upper Division	Hrs.
718 Jewelry	3
724 School Arts Program	3
725 Ceramics	3
722 Arts and Crafts	3
716 Interior Design or 750 Architectural Design	3
814 or 815 Twentieth Century Art to 1925	3
730 or 731 Sculpture	3
Elective (upper division)	3
	24

*Other requirements for the major are explained under **Secondary Education** in the School of Education section.

ASTRONOMY

See *Physics.*

BIBLE

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

BIOLOGY

Professor Kelley (chairman), and Van Zandt; Associate Professors Beede, Sobota, Webster, Worley; Assistant Professors Ameduri, Fishbeck, MacLean, Moritz, Peterson, Rufh, Schroeder, Sturm, Toepfer; Instructors Brennan, Cannon, Chuey, Sebastiani, Staudt.

Biology courses are offered to meet needs of students wanting a general knowledge of biology; planning to do graduate or research work in specialized areas of biology; training to teach biological sciences; and those planning to enter professional fields such as horticulture, medicine, nursing, pharmacy or others which require a knowledge of biology.

A major in biology requires 50 quarter hours in the department. Biology 550, 562, 570, 680 and 690 provide a core of subject matter essential for all biologists. These courses are especially designed and are recommended for all biology majors. But students who have taken biology 500, 500L, 501, 501L, and 502, 502L can substitute these three courses for 550, 562 and 570 above but must take 680 and 690. The remaining hours may be chosen by the student from specialized upper division courses in the department. Biochemistry and Secondary Education 800 (Special Methods) and Sociology 714, 715 (Physical Anthropology) will be considered as biology courses to meet the 50-hour requirement. Organic chemistry will be required of all biology majors. Fundamentals of Physics is strongly recommended.

TECHNICAL SERVICE COURSES WHICH DO NOT APPLY TOWARDS A MAJOR IN BIOLOGY

The following specialized courses cannot be counted toward a biology major nor for the university science requirement; 530–531, 551–552, and 560 are designed primarily for nurses in Associate of Arts pro-

gram. 600–601 is for Health and Physical Education majors, and 604 is for Home Economics majors.

Lower Division Courses

500, 501, 502. *Principles of Biology.* A comprehensive coverage of basic life science, a course designed primarily to meet science requirement for B.S. in Ed.; B.S. in B.A.; by enrolling concurrently in laboratory sections 500L, 501L and 502L respectively, B.A. students will satisfy their 12-hour laboratory science requirement. 3 + 3 + 3 q.h.

500L, 501L, 502L. *Principles of Biology Laboratory.* Laboratory exercises designed to elucidate Biology 500, 501, 502. Students wishing to satisfy science requirement for Bachelor of Arts degree should take Biology 500 and 500L concurrently followed by 501 and 501L and 502 and 502L. This series adds up to required 12 hours of laboratory science. Prereq.: must be taken concurrently with Biology 500. 501, 502 respectively. 1 + 1 + 1 q.h.

530–531. *Physical Sciences for Nurses.* Chemical and physical principles necessary for the health sciences. Intended for Associate in Arts students. 4 + 4 q.h.

550. *Introduction to Life Science.* Foundational concepts of biology, presentation of findings and thinking that form basis for modern science of biology. Laboratory will repeat classical experiments. Three one-hour lectures and a three-hour recitation-laboratory period a week. Intended for Biology majors (fall). 5 q.h.

551–552. *Functional Anatomy of the Human.* Morphology and function of vital systems of human organism. Three one-hour lectures and a two-hour laboratory each week. Intended for Associate Arts degree in nursing. (551 in fall, 552 in winter). 4 + 4 q.h.

555. *Biology for the Elementary Teacher.* Designed to introduce the prospective grade school teacher to the living world and to enrich training with experiences which can be relayed to younger pupils. Three one-hour lectures and a three-hour laboratory-recitation period a week. Cannot be used to meet B.A. or B.S. science requirements other than those for Elementary Education. (Offered every quarter). 6 q.h.

560. *Medical Microbiology for Nurses.* Introduction to medically important microorganisms, their characteristics and epidemiology. Intended for Associate Arts degree in nursing. (spring). 5 q.h.

562. *Plant Life.* A résumé of the plant world covering basic structure, reproduction, function and phylogenetic relations. Three one-hour lectures and a three-hour recitation-laboratory a week. Intended for Biology majors. Prereq.: Biology 550. (winter). 5 q.h.

570. *Animal Life.* Morphology, natural history and phylogenetic relationships in the animal kingdom. Three one-hour lectures and a three-hour recitation-laboratory period each week. Intended for Biology majors. Prereq.: Biology 550. (spring). 5 q.h.

600–601. *Anatomy and Physiology.* A comprehensive study of the structure and functions of higher organisms with special emphasis on man. Six hours of lecture-laboratory periods each week. Open to health and physical education and home economics majors only. Prereq.: Biology 502 (600 in fall; 601 in winter). 5 + 5 q.h.

604. *Food Microbiology.* Microbiology of the preservation, fermentation, and spoilage of foods. Food sanitation and food poisoning. Two one-hour lectures and two two-hour laboratory periods a week. Open to home economics majors only. Prereq.: Biology 502 and General Chemistry. (winter). 4 q.h.

650. *Structure and Function of Man.* A study of the organ systems of the human. Prereq.: Biology 502. 5 q.h.

660. *Economic Botany.* Plants that serve useful purpose for man as food, fiber, wood, drugs and ornament. Their economic importance, culture, distribution, use and biological significance. (spring). 3 q.h.

673. *Ornithology.* Distribution, natural history, and economic significance of birds. Lectures, laboratory and field trips. Prereq.: Biology 502 or Biology 570. (spring). 2 q.h.

680. *Molecular—Cellular Level of Life.* Chemical-physical functions of cellular structures. Three one-hour lectures and a three-hour recitation-laboratory period a week. Intended for Biology majors. Prereq.: Biology 570 or 502, and one year General Chemistry. (fall). 5 q.h.

690. *Biology of Populations.* Study of factors affecting distribution and ecology of plant and animal population. Field trips will be required as well as lectures and laboratory. Intended for Biology majors. Prereq.: Biology 680. (winter). 5 q.h.

Upper Division Courses

700. *Non-Vascular Plants.* A phylogenetic survey of the algae, Eumycophyta, Bryophytes, bacteria, and viruses: a study of their classification, morphology, gross cytology, reproduction and life cycles, and some ecological and economic aspects. Two one-hour lectures and two three-hour laboratory periods a week. Prereq.: Biology 502 or 562. (fall). 5 q.h.

701. *Inveretebrate Zoology.* Essentials of structure, function, and classification of the invertebrates. Two one-hour lectures and two three-hour laboratory periods a week. Prereq.: Biology 502 or 570. (fall, night section will be available). 5 q.h.

702. *Microbiology.* Preparation of culture media; methods of isolation, cultivation, identification and classification of microorganisms. Two one-hour lectures and two two-hour laboratory periods a week. Prereq.: 18 quarter hours of biology and one year of chemistry. (fall). 4 q.h.

708. *Vertebrate Embryology.* Developmental anatomy and physiology of reproduction of domestic birds and mammals. Two one-hour lectures and two two-hour laboratory periods a week. Prereq.: Biology 502 or 570. (fall). 4 q.h.

710. *Mammalian Anatomy.* A composite study of the anatomical systems of mammals, based on the cat. Two three-hour lecture-laboratory periods a week. Prereq.: consent of instructor. (spring, night section will be available). 4 q.h.

713. *Vertebrate Histology.* The microscopic anatomy of mammalian tissue. Two one-hour lectures and two three-hour laboratory periods a week. Prereq.: Biology 502 or 570. (spring, night section will be available). 5 q.h.

719. *Plant Taxonomy.* Identification of local vascular plants; experience in the use of both natural and artificial keys, in the laboratory and in the field; and discussions concerning current theories in systematic botany. Two four-hour lecture-laboratory periods a week. Prereq.: Biology 562, 762 or 765. (spring, 1970). 5 q.h.

721. *Genetics.* An introduction to classical genetics as revealed by studies in higher plants and animals with particular emphasis on the application of the basic concepts to human heredity. Three hours of lecture per week. Prereq.: Biology 502 or 680. (fall, day and night classes, and winter, day only). 3 q.h.

721L. *Genetics Laboratory.* Individual and group experiments to demonstrate basic concepts of heredity with an introduction to probability and statistical inference. Taken concurrently with Biology 721. Two one-hour laboratory sessions per week. (fall and winter). 1 q.h.

741. *Parasitology.* An introduction to the study of the principal external and internal parasites of animals; morphology, life histories, host-parasite relationships, and controls. Two one-hour lectures and two three-hour laboratory periods a week. Prereq.: Biology 701. (winter). 4 q.h.

762. *Field Botany.* Identification, ecology and significance of local plant species. Students will practice using identification keys under field and herbarium conditions. Lectures and laboratory. Prereq.: Junior standing. (Fall, night lectures and Saturday laboratories will be available). 5 q.h.

765. *Comparative Morphology of Vascular Plants.* Structure, reproduction and phylogenetic relationships of representative vascular plants. Three one-hour lectures and a four-hour laboratory each week. Prereq.: Biology 502 or Biology 562. (spring, night section will be available). 5 q.h.

770. *Vertebrate Zoology.* Taxonomic presentation of phylum Chordata with emphasis on the relationships and significance of vertebrates. Two one-hour lectures and a three-hour laboratory each week. Prereq.: Biology 502 or Biology 570. (fall, night section will be available). 3 q.h.

771. *Entomology.* Zoology, structure, development, habits, identification, economic importance and control of insects. Four one-hour lectures and a two-hour laboratory each week. Prereq.: junior standing. (spring, night lectures and Saturday laboratory). 5 q.h.

772. *Mammalogy.* Taxonomic features, life histories, geographical distribution and economic significance of class Mammalia. Three one-hour lectures and a two-hour laboratory each week. Prereq.: Biology 770. (spring). 4 q.h.

775. *Comparative Vertebrate Anatomy.* Comparison of morphology of vertebrates emphasizing evolutionary development of organ systems. Prereq.: Biology 770 or consent of instructor. (winter, night section will be available). 5 q.h.

802. *Ecology.* A study of plants and animals in relation to environmental factors affecting their abundance and distribution. Participation in field trips will be requested at times other than the scheduled class periods. Two one-hour lectures and two three-hour laboratory-field trip periods a week. Prereq.: consent of instructor. (spring). 5 q.h.

803. *Aquatic Biology.* The biological, physical and chemical aspects of aquatic environments with special emphasis on collection and identification of aquatic organisms. Participation in field trips will be required at times other than the scheduled class periods. Two one-hour lectures and two three-hour laboratory-field trip periods a week. Prereq.: consent of instructor. (spring). 5 q.h.

821. *Plant Anatomy.* Comparative anatomy and histology of the vascular plants. Two one-hour lectures and two three-hour laboratory periods a week. Prereq.: Biology 765. (fall 1970). 5 q.h.

822. *Plant Physiology.* A survey of the physiological processes of plants. Two one-hour lectures and two three-hour laboratory periods a week. Prereq.: Biology 765 and one year of organic chemistry. (spring 1971). 5 q.h.

823. *Advanced Genetics.* Modern concepts of the structure of the gene and the mechanisms of mutation and gene action. Prereq.: Biology 721 and 721L. (spring 1971). 4 q.h.

824. *Bacterial Physiology.* Physiological processes of the bacteria. Prereq.: Biology 702. 3 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. (every quarter). 2 q.h.

832. *Cytology.* Unique properties of living cells: their ultrastructure, chemical and physical basis, and biological significance; study of metabolic enzyme systems and the biochemical basis of growth, differentiation, and inheritance. Prereq.: Organic Chemistry, junior standing, and consent of instructor. (winter 1971). 5 q.h.

833. *Introduction to Vertebrate Physiology.* Introduction to basic physical and chemical principles in physiology of nerve conduction, muscle contraction, digestive, respiration, circulation, endocrine systems and kidney function. Lectures and laboratories. Prereq.: Biology 502 or 680. (winter). 5 q.h.

840, 841. *Biological Techniques.* Introduction to biological instrumentation; techniques relative to histological tissue preparations. Primarily for those planning to do graduate study in advanced biology. Prereq.: 30 quarter-hours of biology and consent of instructor. 2 + 3 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 to 4 q.h.

851. *Immunobiology.* Mechanism of immunity and introduction to serological techniques that are routinely applied in clinical microbiology. Prereq.: Biology 702. (winter 1970). 5 q.h.

853. *Biometry.* Collection and treatment of biological data. Lectures and laboratory. (fall 1969). 4 q.h.

863. *Growth and Differentiation of Plants.* External and internal factors that affect germination, growth, flowering and seed development in plants. Lectures and laboratory. Prereq.: Biology 562. (spring 1970). 5 q.h.

872. *Protozoology.* Morphology, phylogeny and bionomics of protozoa. Lectures and laboratory. Prereq.: Biology 701. (spring 1971). 4 q.h.

874. *Helminthology.* Detailed consideration of parasitic helminths including techniques for collecting, killing, staining and studying parasites. Lectures and laboratories. Prereq.: Biology 741. (spring 1970). 4 q.h.

NATURAL SCIENCE COURSES

Credit for these courses is not applicable toward degree in college of Arts and Science or Engineering; it is applicable toward the Bachelor of Arts degree only if the courses form all or part of a teaching minor in general science.

Lower Division Courses

501. *Physical Science for Elementary Teachers.* A lecture-demonstration-laboratory course presenting the important facts and theories of astronomy, geology, chemistry, and physics. Meets five hours a week. 6 q.h.

520–521. *Physical Science.* Basic principles and fundamental laws of physics as illustrated by mechanics, sound, light, heat and electricity. 3, 3 q.h.

BOTANY

See *Biology.*

CHEMISTRY

Professors Rand (chairman), and Cohen; Associate Professors Foldvary, Mahadeviah, Scribner, R. K. Smith, Spiegel, von Ostwalden, Yingst; Assistant Professors Dobbelstein, Fountaine, Fukui, Gebelein, Lukin, Mettee, Phillips, Reeder, and F. W. Smith.

The Bachelor of Science degree is ordinarily taken by those who plan to continue in graduate school or to accept positions as chemists in industry. In certain cases the Bachelor of Arts degree may be taken by chemistry majors.

Lower Division Courses

505, 506. *Fundamentals of Chemistry.* An introduction to the principles and methods of chemistry and a study of the more important elements and compounds. Three hours of lecture and recitation and three hours of laboratory with discussions. Prerequisite for 505: two years of high school mathematics of which one year must be algebra. Mathematics must be continued in college if work in chemistry is continued beyond Chemistry 507 other than Chemistry 719, 720, and 705. Chemistry 505 is prerequisite to 506. Students planning to major in the physical sciences or engineering should take Chemistry 515, 516, and 517. 4 + 4 q.h.

507. *Fundamentals of Chemistry and Qualitative Analysis.* Prereq.: Chemistry 506. 4 q.h.

508. *Problems in Chemistry.* Problems in first year chemistry. Required for those who have had or are taking Chemistry 507 and have decided to do further work in chemistry other than Chemistry 719, 720, and 705. Prerequisite or concurrent: Chemistry 506. 3 q.h.

515, 516. *General Chemistry.* A course in the fundamental principles and a study of the more important elements and compounds. Three hours lecture and recitation and three hours of laboratory with discussions. Intended for physical science majors and students in engineering. Prerequisite for 515: two years of high school algebra, one year of high school geometry, and one year of high school chemistry. Prerequisite for 516: Chemistry 515; prerequisite or concurrent, first quarter college mathematics. 4 + 4 q.h.

517. *General Chemistry and Qualitative Analysis.* A continuation of Chemistry 516 and carefully chosen work in qualitative analysis which will best serve in teaching basic fundamentals. Prereq.: Chemistry 516 and continued mathematics. 4 q.h.

603, 604. **Quantitative Analysis.* A study of chemical equilibrium, stoichiometry, theory of errors, volumetric procedures 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. *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 discussions. Prereq.: Chemistry 720. 4 q.h.

706. *Chemical Literature.* Examination of standard reference works and periodicals with written reports based upon technical writing procedures. Prereq.: Chemistry 722, German 611 (may be concurrent). 2 q.h.

709. *Introduction to Polymer Chemistry.* Introduction to polymerization and polymer properties. Prereq.: Chemistry 721 and four quarters of college physics. 3 q.h.

711, 712. **Biochemistry.* 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, Biology 502. 3 + 3 q.h.

719, 720, 721. **Organic Chemistry.* 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.* Additional laboratory preparations and techniques. This course is required for all chemistry majors. One hour lecture and six hours laboratory with discussions. Prereq.: Chemistry 721. 3 q.h.

723. *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.

724. *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.

729. *Inorganic Chemistry I.* The fundamental principles underlying the structure and properties of the elements and their compounds. Prereq.: Chemistry 740. 3 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. 3 q.h.

739, 740, 741. **Physical Chemistry.* Principles and applications of physical chemistry. Three hours lecture and three hours laboratory. Prereq.: Chemistry 603, Physics 601, 602, 603, Mathematics 674 (may be concurrent). 4 + 4 + 4 q.h.

803, 804. **Chemical Instrumentation.* A study of the theoretical foundations of instrumental procedures and the application and use of instruments in analytical work. Two hours of lecture or recitation and six hours of laboratory with discussions. Prereq.: Chemistry 741. 4 + 4 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

*Must be taken in sequence.

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 lectures a week. Prereq.: Chemistry 722 and 741. 3 q.h.

829, 830. *Inorganic Chemistry II and III.* Topics of current interest in inorganic chemistry. Need not be taken in sequence. Prereq.: Chemistry 729 and 741. 3 + 3 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.* 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; Biology 502. 3 + 3 + 3 q.h.

845, 846. *Biochemical Techniques.* Laboratory course designed to illustrate modern 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 adviser by the Department. The adviser will discuss the overall curriculum necessary for a degree in chemistry and will assist the student in the preparation of a suitable course sequence.

For the degree of Bachelor of Science with a major in metallurgy, a mimeographed curriculum is available in the Chemistry Department Office.

*Must be taken in sequence.

CLASSICAL STUDIES*

Associate Professor Ives (supervisor); Assistant Professor Veccia

Classical Studies courses, besides meeting the needs of department majors and prospective Latin teachers, are intended to complement or supplement study in various other liberal arts subjects, to satisfy certain pre-professional students' needs, and to 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, Latin 601, 602, and 603 provide for students whose entrance language was Latin the most expeditious means of completing the foreign language proficiency requirement.

Courses in ancient Greek primarily provide knowledge of the language of the people with whose curiosity, originality, and transmutations of older cultures Western civilization began; but attention is also given to matters which make them useful to Latin majors, pre-seminary students, pre-medicine students, and students with linguistic interests, as well as to those interested in still other aspects of Western culture and its origins.

Other Classical Studies courses seek, without requiring a knowledge of ancient languages, to inform the student on important aspects of Greek and Roman culture, to introduce him to some of its influential products, and to 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 and ancient Greek and in 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 combined major in Classical Studies consists of 70 quarter

* The Department of Classical Studies is now part of the Department of Foreign Languages.

hours chosen from Classical Studies courses (including ancient Greek and Latin) and from certain courses in other departments; the student should consult the supervisor of Classical Studies before undertaking this major. Classical Studies 830 and 831 satisfy the general requirement in philosophy; for credit allowed for them toward majors in other liberal arts subjects, see *Humanities*. Classical Studies 631 may be counted toward the 6-hour literature requirement included in most curriculums.

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 Greek and Roman, with some attention to their origins and cultural significance, and of works of literature, both classical and modern, in which these myths are used. Prereq.: Communication 508, or equivalent, with grade of C. Listed also as Humanities 631. 3 q.h.

Upper Division Courses

714. *Ancient Art I.* A survey of the art and architecture of the ancient Near East and especially of Greece through 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 Hellenistic Greece and the Roman world, and their relation to the civilizations in which they were produced and to earlier Greek 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 651, or consent of teacher. 3 q.h.

753. *History of Ancient Rome.* Identical with History 753. Prereq.: History 651, or consent of teacher. 3 q.h.

830. *Older Classics A: Ancient Drama and Poetry.* Extensive readings in English from most or all of the following (and perhaps others): Aeschylus, Sophocles, Euripides, Aristophanes, The Old Testament, Aristotle's *Poetics*, Menander, Plautus, Seneca. Prereq.: Communication 508 or equivalent, and junior or senior standing. Listed also as Humanities 830. 4 q.h.

831. *Older Classics B: Ancient Prose and Poetry.* Extensive readings in English from most or all of the following (and perhaps others): The Old Testament, Homer, Herodotus, Thucydides, Plato, Aristotle, Lucretius, Cicero, Virgil, Greek and Roman lyric and elegiac poetry. Prereq.: Communication 508 or equivalent, and junior or senior standing. Listed also as Humanities 831. 4 q.h.

COMMUNICATION

See *English and Communication.*

CRIMINOLOGY

Assistant Professors Foster (supervisor), DeGarmo, and Boland; Instructor Cress.

The Criminology program offers a concentration in Law Enforcement Administration or Corrections. A major in Law Enforcement Administration consists of at least 45 quarter hours of courses of which at least 20 quarter hours of courses must be from the upper division courses listed below. Since is is important that a student in Law Enforcement Administration acquire a basic technical knowledge of the various operational aspects of law enforcement, certain courses are offered jointly with the Police Science Technology Program* of the Technical and Community College.

A major in Corrections is offered for students preparing for a career in probation, parole or institutional services with either adults or juveniles. The major consists of a total of 45 quarter hours of courses in Criminology and certain other courses

*Youngstown State University offers two academic programs in law enforcement: a two year program, Police Science Technology, leading to the degree Associate in Arts; and a four year program leading to the Bachelor of Arts degree with a major in Law Enforcement Administration. The Associate in Arts program is considered appropriate training for persons preparing for employment in most municipal, state and private law enforcement agencies. The Bachelor of Arts program is designed for persons preparing for employment in federal law enforcement agencies or administrative positions in municipal or state agencies, and for instructors in police training programs.

selected on an interdisciplinary basis. It is highly recommended that students majoring in Corrections select a minor in Sociology, Psychology or Political Science. Courses 701, 702, 703, 800, 805 and 806 are required. Other selected courses may be added by permission of the program supervisor. Among these are Psychology 702, 802 and 805 and Sociology 722.

Lower Division Courses

The following courses are offered in the Police Science Technology curriculum but are applicable to a major in Law Enforcement Administration as lower division courses.

PST	501	Introduction Law Enforcement	3 q.h.
PST	604	Patrol & Field Operations	3 q.h.
PST	605	Criminal Justice	3 q.h.
PST	610	Principles of Criminal Investigation	3 q.h.
PST	611	Advance Criminal Investigation	3 q.h.
PST	612	Criminal Identification	3 q.h.
PST	620	Criminal Procedure	3 q.h.
PST	621	Evidence	3 q.h.
PST	660	Police Community Relations	3 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. 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. 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 six hours of practicum per week. Prereq.: junior standing. 5 q.h.

735. *Juvenile Delinquency.* Social and psychological factors underlying delinquency, the juvenile court and probation; treatment and prevention measures. Prereq.: Sociology 600 (Identical with Sociology 735). 3 q.h.

736. *Criminology I.* The psychological and social factors underlying crime, criminal behavior and prevention. Prereq.: Sociology 600 (Identical with Sociology 736). 3 q.h.

737. *Criminology II.* The legal administration of criminal justice, from apprehension to acquittal or conviction. Prereq.: Sociology 600 (Identical with Sociology 737). 3 q.h.

748. *Commercial and Industrial Security.* Plant protection and industrial security; merchandising safety and security; credit and insurance investigative procedures. 3 q.h.

753. *Criminalistics.* Study of fingerprinting, chemical analysis, polygraph operations, photography, fundamental pharmacology as these relate to the preparation and evaluation of physical evidence. Three hours of lecture and one hour of laboratory work a week. 3 q.h.

770. *Municipal Police Administration.* Detailed examination of police organization and management; tactics and budgeting, supervision; record systems; discipline, promotion, communications, public relations. 3 q.h.

780. *Special Police Problems.* Police procedures in riot control, sex offenders, narcotics, emotionally disturbed persons, dependent and neglected children, domestic quarrels, etc. Prereq.: senior standing. 3 q.h.

800. *Research and Theory in Corrections.* Extensive reading in the literature of the correctional field, with special attention given to contemporary research data and theory in corrections. Prereq.: senior standing. 5 q.h.

805, 806 *Correctional Internship.* Observational and participatory experiences in correctional agencies under the direction of experienced and qualified correctional personnel. The student will spend 8 hours weekly in the agency. In addition attendance at a 2-hour weekly seminar is required. Prereq.: permission of instructor. 5, 5 q.h.

DRAMATICS

See *Speech and Dramatics.*

EARTH SCIENCE

Assistant Professor E. Harris, Jr. (supervisor).

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 a teaching field in earth science.*

*Interested students should consult with the Geology Department chairman.

Courses for Earth Science Major

Astronomy
503 Descriptive Astronomy .....(5)
608 General II .....(3)

Biology
500 Principles .....(4)
501 Principles .....(4)

Chemistry
505 Fundamentals of Chemistry ....(4)
506 Fundamentals of Chemistry ....(4)
(or)
515 General Chemistry .....(4)
516 General Chemistry .....(4)

Geography
502 Principles .....(5)
625 General Meteorology .....(3)

Geology
503 Physical Geology .....(5)
503L Physical Geology Lab .....(1)
504 Historical Geology .....(5)
504L Historical Geology Lab .....(1)
604 Megascopic Petrography .....(6)
701 Geomorphology .....(6)
705 Principles of Paleontology .....(6)
804 Ground Water .....(5)

Mathematics
502 Algebra II .....(5)
503 Trigonometry .....(3)

Physics
501 Fundamentals of Physics .....(3)
502 Fundamentals of Physics .....(3)

ECONOMICS

Professors Hahn, Kermani and Stocks; Associate Professors Mackall (chairman), Niemi; Assistant Professors Bee, Koss, Liu, Mehra, Ronaghy, Smythe; Instructors Jakobs, and Swan.

A major in economics consists of 48 quarter hours. Required courses are 601, 602, 603; 704, 705, 706; 710, 711, 712, 713.

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

601. *Principles of Economics I.* An introduction to basic principles of economics and American capitalism, including national income accounts, analytical tools of employment theory, and fiscal policy. 3 q.h.

602. *Principles of Economics II.* Money, monetary policy, and economic growth. A survey of current domestic economic problems. International economics. Prereq.: 601. 3 q.h.

603. *Principles of Economics III.* The market structure of American capitalism; economics of the firm—price and output determination; and resources allocation—pricing and employment of resources. Prereq.: 602. 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. Prereq.: Economics 601–602–603. 3 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. Prereq.: Economics 601–602–603. 3 q.h.

703. *Monetary and Fiscal Policy.* Study of the techniques of monetary and fiscal policy with emphasis on their role as determinants of the level of national income. Prereq.: 701–702. 3 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. 3 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 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. 3 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 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 603. 3 q.h.

710. *Intermediate Micro-economic Theory I.* A systematic analysis of the theory of demand and the theory of the firms: production, input and output choices, and some basic concepts of linear programming. Prereq.: Economics 603 and 709 or Mathematics 550. 3 q.h.

711. *Intermediate Micro-economic Theory II.* A continuation of the 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 710. 3 q.h.

712. *Intermediate Macro-economics I.* A study of the construction of national income and production accounts and the basic determinants of income, output, and employment. Prereq.: Economics 603 and 709 or Mathematics 550. 3 q.h.

713. *Intermediate Macro-economics II.* 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 712. 3 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. 4 q.h.

802. *Comparative Economic Systems.* A comparative study of American capitalism, Russian communism, British socialism, with consideration of the theory of the corporate state. Prereq.: Economics 603. 3 q.h.

803. *Business and Government.* An analysis of the influence of the common law and the State and Federal anti-trust legislation upon the development, the growth, and the present status of competition, imperfect competition, and monopoly in the American economy. Prereq.: Economics 603. 3 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 713 or consent of the instructor. 3 q.h.

806. *History of Economic Thought I.* Ancient beginnings, the Middle Ages, Mercantilism, the Physiocrats, the forerunners of Adam Smith, Adam Smith, early socialist thought. Prereq.: Economics 603. 3 q.h.

807. *History of Economic Thought II.* Utilitarianism. English Classical school and dissenters, Ricardian socialist, Continental developments, Say, Romantics school, Karl Marx, Older Historical school, forerunners and outburst of Marginalism. Prereq.: Economics 603. 3 q.h.

808. *History of Economic Thought III.* General equilibrium, second generation of Marginalists. Younger Historical school, development of indifference curve analysis, institutional economics, business cycle theories, Swedish monetary school, Keynes and "new economics", Revisionism, theoretical feasibility in a social economy, welfare economics. Prereq.: Economics 603. 3 q.h.

809. *Economics for Teachers.* An examination of the types of goods and services produced in the American economy. A study of the methods used in this production. An analysis of the sharing of increased productivity among those who benefit from it. Preference given to upper class students considering teaching as a career. 3 q.h.

810. *Business Economics.* An application of economic analysis to the solution of business problems. A combination of text and case materials. Emphasis upon executive decisions for the allocation of resources. 3 q.h.

811. *Theory of International Trade I.* Theory and practice of foreign trade and capital movement; international economic disequilibrium, and adjustment in a stable-rate and variable-rate system. Prereq.: Economics 603. 3 q.h.

812. *International Economic Development II.* Theories of economic growth as applied to developing economies. An analytical study of the nature of the obstacles to, and future possibilities for accelerated economic growth in underdeveloped nations and of maintaining development in rich countries. The economic effects of international movements of capital and intergovernmental economic assistance. Prereq.: Economics 603. 3 q.h.

813. *International Trade and Economic Development III.* Seminar. Each student undertakes original research in the theoretical or policy matters of international trade and presents his findings to the class, who study and discuss them. (Suggested areas of research: U.S. balance of payments and international monetary reform; European economic community and world trade; developing nations' and world trade.) Prereq.: Economics 812. 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 601–602–603. 4 q.h.

821. *Location Theory.* An analysis of the economic considerations which do much to explain the locational patterns of individual business firms within regions of the U.S. and of the forces promoting agglomeration of firms. Stress is placed upon the relative importance of material and human resource inputs, the market for outputs, and the quantity and quality of economic and social overhead capital in attracting different types of firms to a region. In addition, the concepts of external and internal economies of scale, intermunicipal cost precipitation, and external costs and benefits are explored in order to approximate the optimum spatial extent for the provision of public goods and services. Prereq.: Economics 820. 4 q.h.

822. *Seminar in Regional and Urban Economics.* Selected readings in the study of the growth of regions in the U.S. Topics discussed include the theory and strategy of regional growth, cost-benefit analysis as a tool for regional public investment decision making; determinants of the demand for and supply of transportation facilities; and problems in the finance of urban and regional public goods and services. Prereq.: Economics 821. 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 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 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 603. 4 q.h.

ENGLISH AND COMMUNICATION

Professors Pfau (chairman), K. Dykema, Hankey, T. Miner, and W. Miner; Associate Professors M. V. Hare, R. Hare, Ives, Secrist, and Solimine; Assistant Professors W. Baker, Baird, Budge, Conroy, C. Gay, T. Gay, Kelty, Knapp, Krynicky, Murphy, L. Rosenthal, W. Schultz, and Thompson; Instructors Brothers, Carter, K. Crites, M. Curran, S. Curran, Einstein, Polite, A. Rowe, R. Rowe, Schafer, Shale, Turek, Van Gorder, and Zoellner.

English majors are expected to complete 45 hours including at least five hours in American literature, 18 hours in English literature, English 755 and 756, and a course in advanced composition. In addition, all English majors must show evidence of having completed a satisfactory term paper in an Upper Division English course. English 505–506–507–508 (Communication I–II–III–IV) does not count toward a major in English.

Students who plan to teach high school English should major in English, unless they intend English to be a second teaching field, in which case they should complete 31 hours in English, distributed as follows: six hours in American literature; nine hours in English literature including the study of poetry and prose; a course in advanced composition; English 755 and 756; and three hours in some other English course.

Credit in English will be given for Humanities 631, Mythology in Literature; Humanities 830, Older Classics I; Humanities 831, Older Classics II; Humanities 832, Older Classics III; Humanities 833, Modern Classics I; Humanities 834, Modern Classics II; and Humanities 835, Modern Classics III.

English 505–506–507–508 is required of all University students with the exception of students in two-year degree programs. English 508 is prerequisite to all other

English courses. Two English courses numbered 600 through 607 (or one of these and Humanities 631) are normally prerequisites to other 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 and Communication 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.

Non-Credit 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 but upon recommendation of the teacher, a student who gets a grade of Satisfactory may be permitted to enroll in English 506 without having taken English 505. Students taking this course will have six hours added to their degree requirement. 6 q.h.

Lower Division Courses

505–506–507–508. *Communication I–II–III–IV.* This course attempts to improve the effectiveness of the student's writing and speech, with emphasis on logical organization and accurate expression, and to make him more aware of the nature, function, and significance of the various media of communication. A grade of C or better in English 508 is required for graduation; no D grade is given in English 508. *Does not count toward a major in English.* (For certification, graduation, and transfer purposes, this course may be interpreted as nine hours of composition and three hours of speech.)
3 + 3 + 3 + 3 q.h.

505H–506H–507H. *Communication Honors I–II–III.* An honors course for selected students, emphasizing wide reading and independent research. A satisfactory grade (A or B) in English 507H will be regarded as fulfillment of the University requirement in Communication. Students may be transferred from regular Communication sections to Honors sections with the recommendation of the teacher and the approval of the Communication Honors coordinator. *Does not count toward a major in English.* 3 + 3 + 3 q.h.

600, 601. *Introduction to Literature.* A nontechnical, non-historical course in which important contemporary and older works of literature are read and discussed critically for the purpose of increased delight and understanding. *Designed to fulfill the general requirement in English literature.* Prereq.: English 508 or its equivalent. English 600: introduction to fiction; 601: introduction to poetry and drama.
3 + 3 q.h.

602, 603, 604. *Survey of English Literature.* Major works of poetry and prose. English 602: *Beowulf* to Milton; 603: Dryden to the Romantics; 604: the Victorians to the present. Prereq.: English 508 or its equivalent.
3 + 3 + 3 q.h.

605, 606, 607. *Survey of American Literature.* Major works of poetry and prose. English 605: colonial writers to Hawthorne; 606: Melville to James; 607: the naturalists to the present. Prereq.: English 508 or its equivalent.
3 + 3 + 3 q.h.

608. *Children's Literature.* A study of the development of children's literature, giving the prospective elementary teacher some ways of judging books and some insights into the problems of making literature a meaningful experience for children. Required of all elementary education candidates. *Does not satisfy the general literature requirement; does not count toward a major in English.* Prereq.: English 508 or its equivalent. 4 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 508 or its equivalent. 5 q.h.

Upper Division Courses

A total of six quarter hours in the above literature courses (600, 601, 602, 603, 604, 605, 606, 607) or Humanities 631, or consent of the department chairman, is prerequisite to any of the following courses, unless otherwise stated.

705, 706, 707. *Journalism.* The organization and functions of a newspaper office, with attention to reporting news stories, preparing copy,

editing and arranging the printed page. English 705 offered in fall quarter, 706 in winter quarter, 707 in spring quarter. Prereq.: junior or senior standing. 3 + 3 + 3 q.h.

705L, 706L, 707L. *Journalism Workshop.* Application through student publications of the principles of 705, 706, 707. Students will register for 3 quarter hours credit unless specially authorized. Each course may be repeated once. Workshop credit may apply toward a minor in journalism. Prereq. (or concurrent): English 705, 706, 707 and consent of instructor. 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. This course is especially designed for those who plan to teach English. 3 q.h.

743, 744, 745. *Creative Writing.* 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. Prereq.: English 508 or its equivalent. 4 q.h.

754. *Phonology.* Identical with Linguistics 754. Prereq.: English 508 or its equivalent. 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 508 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.* 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 traditions, realism, or naturalism. 5 q.h.

772, 773, 774. *The English Novel.* The history and development of the novel in England. English 772: the beginnings of the novel to Smollett; 773: the Gothic novel to George Eliot; 774: Hardy to 1920. 3 + 3 + 3 q.h.

775. *The American Novel.* The history and development of the novel in the United States during the nineteenth and twentieth centuries. 5 q.h.

776. *The Modern Novel.* A study of some classic European and English novels of the nineteenth and twentieth centuries, with particular attention to the ideas in them as reflections of some basic problems in modern society. 5 q.h.

855. *Semantics.* Identical with Linguistics 855. Prereq.: English 650 or 755. 4 q.h.

860. *Chaucer.* Reading of Chaucer's principal works, with some study of his immediate predecessors and contemporaries. 5 q.h.

861, 862. *English Drama.* The history of the drama in England from the sixteenth through the eighteenth centuries, excluding Shakespeare. English 861: Elizabethan and Jacobean; 862: Restoration and eighteenth century. 3 + 3 q.h.

864. *Modern Drama.* English, Irish, and (in translation) continental drama from Ibsen to the present. 5 q.h.

865. *American Drama.* The emphasis is mainly on the drama since 1915. 5 q.h.

868. *Modern American and British Poetry.* An intensive study of poetry in English published since 1890. 5 q.h.

871. *The Negro in American Literature.* Literature by and about the Negro in America. 5 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. 5 q.h.

882. *The Seventeenth Century.* Important non-dramatic works in prose and poetry, excluding Milton. 3 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.

885. *The Eighteenth Century.* The major writers of the period, excluding novels and plays. 5 q.h.

887. *The Romantic Period.* Important works in prose and poetry from 1789 to 1832 with emphasis on the poetry of Blake, Wordsworth, Coleridge, Shelley, Keats, and Byron. 4 q.h.

888. *Victorian Poetry.* Poetry of the Victorian period studied in its historical context, with emphasis on Tennyson, Browning, and Arnold. 3 q.h.

889. *Victorian Prose.* Prose of the Victorian period studied in its historical context, with emphasis on Carlyle, Arnold, Ruskin, Morris, and Mill. 3 q.h.

FOREIGN LANGUAGES

Associate Professors Ward (chairman), Aliberti, C. Dykema, Garcia, Ives, and Metzger; Assistant Professors Barna-Gulanich, Flasher, Linkhorn, Stoll, and Veccia; Instructor Rigo.

See *French, German, Greek, Hebrew, 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 24 quarter hours must be in literature.

Unless otherwise stated, the prerequisite for any Upper Division Course is French 602, or four years of high school French, or consent of the department chairman.

Lower Division Courses

501–502–503. *Elementary French.* 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. No credit can be given for this course if the student has been given entrance credit for two years of high school French. Five class meetings. 4–4–4 q.h.

601. *Intermediate French.* Grammar reviewed through oral and written exercises. Reading of modern prose and poetry. Five class meetings. Prereq.: C or better in French 503 or in second-year high school. 4 q.h.

602. *Intermediate French.* Continuation of French 601. Five class meetings. Prereq.: 601 or equivalent. 4 q.h.

Upper Division Courses

701. *Survey of French Literature.* Middle ages to 1700. 3 q.h.

702. *Survey of French Literature.* 1700 to 1850. 3 q.h.

703. *Survey of French Literature.* 1850 to present. 3 q.h.

750. *French Civilization.* A study of the geography, history, traditions, and culture of France. 5 q.h.

760. *Applied French Phonetics.* A study of phonetics for application to individual pronunciation problems; intensive drill, conversation. 3 q.h.

761. *Conversational French.* Facility in oral expression developed through exercises on and discussions of assigned topics and through prepared and extemporaneous situational dialogs and plays. 5 q.h.

770. *French Composition.* Skill in writing developed through directed composition, starting at the intermediate level. 3 q.h.

771–772. *Advanced French Grammar.* A review in depth of French grammar through analysis of the stylistic devices of literary works, and through exercises, translation, and original composition. Prereq.: 770 or equivalent. 3 + 3 q.h.

773. *Explication de Texte.* Detailed oral examination of poetry and prose to develop skills in perceptive analysis of literature. 5 q.h.

774. *Advanced French Composition.* A course designed to develop skills in free composition on assigned topics. Prereq.: 772 or equivalent. 5 q.h.

801. *Rabelais, Montaigne, Baroque Period of 17th Century Literature.* Prereq.: 701 or consent of instructor. 3 q.h.

802. *Corneille, Age of Louis XIV, I.* Prereq.: 701 or consent of instructor. 3 q.h.

803. *Age of Louis XIV, II.* Prereq.: 701 or consent of instructor. 3 q.h.

811. *Montesquieu and other writers of first half of century excluding Voltaire and Rousseau.* Prereq.: 702 or consent of instructor. 3 q.h.

812. *Voltaire and Rousseau.* Prereq.: 702 or consent of instructor. 3 q.h.

813. *Diderot and other writers of second half of century.* Prereq.: 702 or consent of instructor. 3 q.h.

821. *Precursors of Romanticism, and Romanticism.* Prereq.: 702 or consent of instructor. 3 q.h.

822. *Realism; Post-Romantic poets through Baudelaire.* Prereq.: 702 or consent of instructor. 3 q.h.

823. *Naturalism; Parnasse; Symbolism.* Prereq.: 703 or consent of instructor. 3 q.h.

831. *France; Proust; 20th Century poetry.* Prereq.: 703 or consent of instructor. 3 q.h.

832. *20th Century novels after Proust.* Prereq.: 703 or consent of instructor. 3 q.h.

833. *20th Century theatre.* Prereq.: 703 or consent of instructor. 3 q.h.

862. *History of the French Language.* The evolution of Latin to Modern French from the standpoint of phonetics, morphology, syntax, and vocabulary. 3 q.h.

865–866. *Comparative Romance Linguistics.* First course: The phonology and vocabulary of the chief Romance dialects. Second course: Morphology and syntax. 3 + 3 q.h.

870, 871, 872. *Special Reading and Research.* Directed study on a central theme or thesis in French language or literature terminating in an examination, research paper, or both. Prereq.: Permission of the department head and the voluntary agreement of the instructor. 1–5, 1–5, 1–5 q.h.

873, 874, 875. *Seminar in French Language or Literature.* A seminar in problems in French language or literature. Prereq.: Senior standing or permission of the instructor. 3, 3, 3 q.h.

876. *Study Abroad.* See the department chairman for details. Prereq.: prior permission from the department chairman and major advisor. 1–15 q.h.

GEOGRAPHY

Associate Professors Klasovsky (chairman) and Laitman; Assistant Professors Manton and Matzye; Instructor Vechiarella.

A major in geography consists of a minimum of 45 quarter hours, of which, at least 30 quarter hours must be earned in upper division courses.

SUGGESTED ELECTIVES: Science requirement should be met by Geology 501 and 502; Economics 704, 705 and 706 are strongly recommended; other acceptable upper level electives are dependent upon the student's area of interest.

Lower Division Courses

502. *Principles of Geography.* A study of causal relationships between life activities and their physical surroundings. 5 q.h.

519. *Economic Geography.* An introduction to the study of the distribution and supply of raw materials of the earth; land and water utilization; and problems in population distribution. 5 q.h.

600. *Introduction to World Culture Geography.* An introductory study of the elements of the cultural setting: their nature, distribution, land use, sequent occupance, and settlement patterns, and their significance in relation to each other and to the environment. Prereq.: Geography 502 or consent of teacher. 3 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 types of continents. Prereq.: Geography 502 or equivalent. Offered in the fall quarter. 3 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. Prereq.: sophomore standing. 3 q.h.

Upper Division Courses

701. *Geomorphology.* Identical with Geology 701. Prereq.: Geology 502 or consent of teacher. 6 q.h.

703. *Physiography of the United States.* Identical with Geology 703. Prereq.: Geology 602. 6 q.h.

710. *Regional Geography of Middle America and the Caribbean.* A regional approach to the economic and cultural backgrounds of Latin America from the Rio Grande to the continent of South America, stressing the operation of geographic principles in development and behavior. Prereq.: junior standing and 18 hours of social studies or equivalent. 3 q.h.

711. *Regional Geography of South America.* A regional approach to the economic and cultural backgrounds of the countries of South America, stressing the operation of geographic principles in their development and behavior. Prereq.: junior standing and Geog. 502 or 519, or junior standing and 18 hours of social studies or equivalent. 3 q.h.

712. *Regional Geography of Africa, South of the Sahara.* Resources, political affiliations and stages of economic development of Africa, South of the Sahara Desert. Prereq.: junior standing and Geog. 502 or 519, or junior standing and 18 hours of social studies or equivalent. 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. Prereq.: junior standing and Geog. 502 or 519 or junior standing and 18 hours of social studies or equivalent. 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. Prereq.: junior standing and Geog. 502 or 519, or junior standing and 18 hours of social studies or equivalent. 3 q.h.

715. *Regional Geography of Southeast Asia.* A regional approach to the economic and cultural backgrounds of the political units of southeast Asia, emphasis on India, Pakistan, and the countries to the east. Prereq.: junior standing and Geog. 502 or 519, or junior standing and 18 hours of social studies or equivalent. 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 geographic backgrounds. Prereq.: junior standing and Geography 502 or 519, or junior standing and 18 hours of social studies or equivalent 3 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. Prereq.: junior standing and Geography 502 or 519, or junior standing and 18 hours of social studies or equivalent. 3 q.h.

718. *Geography of Anglo-America.* The physical background of the English-speaking parts of North America and its relation to their economies and cultures. The physiographic regions: the types of climate and their factors; natural vegetation, soils; the historical geography; the geographical regions. Prereq.: junior standing and Geography 502 or 519, or junior standing and 18 hours of social studies or equivalent. 5 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. Prereq.: junior standing and Geography 502 or 519, or junior standing and 18 hours of social studies or equivalent. 3 q.h.

800. *European Area Study.* A course in the geography of Western Europe with special emphasis on urban and cultural geography. The class made up of 20 to 25 members, visits 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 geography, comparing and contrasting 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 90 days after the end of the course. Prereq.: junior standing. Fee: varies from year to year. 9 q.h.

Senior standing in one of the Social Sciences, or, senior standing and consent of the Geography department chairman, is prerequisite to any of the following courses:

801. *Resource Appraisal and Utilization.* Economic and geographic appraisal of resource conservation in the United States. Regional and national planning for resource utilization. 5 q.h.

802. *Historical Geography of Anglo-America.* A study of the settlement and sequence occupance of Anglo-America, with emphasis on the physical, climatic, and cultural influence. Prereq.: senior standing in one of the social sciences, or senior standing and consent of the geography department chairman. 3 q.h.

803. *Urban Geography.* Origin and growth of cities. Structure and function of urban centers, their area and expansion and inter-trade center relations, each examined in terms of city planning. Prereq.: senior standing in one of the social sciences, or senior standing and the consent of the geography department chairman. 3 q.h.

804. *Political Geography.* Geographical characteristics of nation states. Geographic factors in the evolution, structure, and function of states. Relation of geopolitics to political geography. Prereq.: senior standing in one of the social sciences, or senior standing and the consent of the geography department chairman. 3 q.h.

GEOLOGY

Assistant Professors C. E. Harris (chairman), Abram and A. Harris.

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.

Students interested in majoring in geology should consult with the Geology Department chairman.

Lower Division Courses

503. *Physical Geology.* A study of the earth and geologic processes that have worked on the earth. May be taken without Geology 503L as a non-laboratory science, or concurrently with Geology 503L as a laboratory science. Five hours of lecture per week. 5 q.h.

503L. *Physical Geology Laboratory.* A laboratory study of minerals, rocks, and topographic maps. Taken concurrently with Geology 503 or under special conditions, separately, with the permission of the instructor. Four hours of laboratory work per week. 1 q.h.

504. *Historical Geology.* A study of the history of the earth through various eras as determined by fossils and stratigraphy. May be taken without Geology 504L as a non-laboratory science, or concurrently with Geology 504L as a laboratory science. Five hours of lecture per week. Prereq.: Geology 503. 5 q.h.

504L. *Historical Geology Laboratory.* Laboratory study of fossils, map interpretation,

sedimentation, stratigraphy, and history of various localities. Taken concurrently with Geology 504, or under special conditions separately, with permission of the instructor. Four hours of laboratory work per week. Prereq.: Geology 503L. Staff (102, 502). 1 q.h.

601. *Economic Geology.* A study of the origin, mode of occurrence and major mining areas of important mineral resources. Five one-hour lectures a week. Not considered a laboratory science course. Geology majors or minors must take Geology 805 (1 q.h.) concurrently with Geology 601. Prereq.: Geology 503 and 503L. 5 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 a week. Prereq.: C or better in Geology 503 and 503L (501). Staff (204). 6 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 a week. Prereq.: Geology 503, 503L. 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 503 and 503L. 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 a week. Prereq.: Geology 701. 6 q.h.

704. *Structural Geology.* A study of the principles of rock deformation, its causes and effects, and methods of determination of geologic structure in the field. Original and secondary features of sedimentary, igneous and metamorphic rocks are studied in detail. Five hours of lecture a week. Prereq.: Geology 503 and 503L, or consent of instructor. 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 a week. Prereq.: Geology 501 or consent of instructor. 6 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 a week. Prereq.: Geology 503 and 503L, Chemistry 506 or 515. 6 q.h.

802. *Stratigraphy.* A study of the formation, sequence and correlation of the stratified rocks. Five hours of lecture a week. Prereq.: Geology 503 and 503L, 504 and 504L. 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, Physics 501 and 502 or 601 and 602. 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 503, 503L, 504, 504L. 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. Prereq.: Consent of the Geology Department Chairman and the instructor. May be repeated once. 1 to 5 q.h.

GERMAN

A major in German consists of 45 quarter hours above the elementary level, of which at least 24 must be in literature including German 820. German 770 or 771 and German 860 or 867–868 are required of German majors.

Lower Division Courses

501–502–503. *Elementary German.* 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. No credit can be given for this course if the student has been given entrance credit for two years of high school German. Five class meetings. 4–4–4 q.h.

601. *Intermediate German.* Elementary composition and conversation based on grammar review. Reading material is chosen both to furnish a basis for further study of German

literature and to provide a working knowledge of the modern language. Five class meetings. Prereq.: C or better in German 503 or high school equivalent. 4 q.h.

602. *Intermediate German.* A continuation of German 601. Five class meetings. Prereq.: German 601 or equivalent. 4 q.h.

611, 612. *Scientific German.* A basic course designed to develop expeditiously an ability to read scientific literature in German. Five class meetings. Prereq.: C or better in German 503 or in second year high school German and one year of a laboratory science or equivalent. 4, 4 q.h.

Upper Division Courses

701, 702, 703. *Survey of German Literature.* An introduction to the study of German literature intended to acquaint the student with the main works and writers and the principal literary tendencies and movements. First quarter: from the beginnings to 1700. Second quarter: from 1700 through Romanticism. Third quarter: from Young Germany to the present. Prereq.: German 602 or equivalent. 3 + 3 + 3 q.h.

712. *German Civilization.* A study of the geography, history, and traditions of Germany. Prereq.: German 602 or equivalent. 3 q.h.

760, 761, 762. *Conversational German.* Conducted entirely in German, this course stresses pronunciation, vocabulary, and speech patterns, and gives the student an opportunity to express himself orally in German through a variety of techniques. Prereq.: German 602 or equivalent. 3, 3, 3 q.h.

770. *German Grammar and Composition.* Advanced study of German grammar, sentence structure, idioms, and the writing of simple prose. Prereq.: German 602 or equivalent. 5 q.h.

771. *Advanced German Composition.* Advanced training in written self-expression. Original compositions in German and class discussions. Prereq.: German 770 or permission of the instructor. 3 q.h.

800. *Early German Literature.* Intensive study of important German works from the eighth century through the seventeenth century with emphasis on the medieval *Bluetezeit.* Prereq.: German 701 or permission of the instructor. 3 q.h.

811, 812. *Eighteenth Century German Literature.* Intensive study of the Storm and Stress movement and Classicism including the works of Goethe, Schiller, and Lessing. Prereq.: German 702 or permission of the instructor. 3, 3 q.h.

820. *Goethe's Faust.* Study of the Faust legend and its influence on Goethe's masterpiece. An intensive textual criticism of both parts of Goethe's work is presented to the student. Prereq.: German 811 or 812 or permission of the instructor. 5 q.h.

821, 822, 823. *Nineteenth Century German Literature.* Intensive study of important German writers and their works from Romanticism through Realism. Prereq.: German 703 or permission of the instructor. 3, 3, 3, q.h.

831, 832, 833. *Recent German Literature.* Intensive study of significant German writers and their works from Naturalism to the present. Prereq.: German 703 or permission of the instructor. 3, 3, 3, q.h.

860. *History of the German Language.* Prereq.: German 602 or equivalent. 3 q.h.

867, 868. *Germanic Linguistics.* An introduction to the history and comparative study of the Germanic languages, with particular attention to the West Germanic literature languages: German, Dutch, and English. Prereq.: German 602 or equivalent. 3 + 3 q.h.

870, 871, 872. *Special Reading and Research.* Directed study on a central theme or thesis in German language or literature terminating in an examination, research paper, or both. Prereq.: Permission of the department head and the voluntary agreement of the instructor. 1–5, 1–5, 1–5, q.h.

873, 874, 875. *Seminar in German Language or Literature.* A seminar in problems in German language or literature. Prereq.: senior standing or permission of the instructor. 3, 3, 3 q.h.

876. *Study Abroad.* See the department chairman for details. Prereq.: prior permission from the department chairman and major advisor. 1–15 q.h.

GREEK (ANCIENT)

A major in Greek is not offered, but credit in Greek may be counted toward a major in Latin and toward a combined major in Classical Studies or in Humanities. The Supervisor of the Department of Classical Studies should be consulted. For courses pertaining to ancient Greece that require no knowledge of its language, see *Classical Studies.*

Lower Division Courses

501–502–503. *Elementary Greek.* 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. Offered in the fall of even-numbered years. 3 + 3 + 3 q.h.

601. *Intermediate Greek I.* Reading in one or more prose writers and/or poets (including the dramatists), preceded or accompanied by some review of elementary Greek. Offered in the fall of odd-numbered years. Prereq.: Greek 503 or equivalent, or consent of the Supervisor of Classical Studies. 3 q.h.

602, 603. *Intermediate Greek II and III.* Continuation of Greek 601, normally in the winter and spring quarters. Prereq.: Greek 601 or consent of the Supervisor of Classical Studies. 3 + 3 q.h.

Upper Division Courses

The following courses can be given on request by arrangement with the Supervisor of Classical Studies.

701. *Advanced Readings.* Reading in one or more major Greek writers, selected with consideration of the students' interests. Prereq.: Greek 603 or equivalent, and consent of the Supervisor of Classical Studies. 3 q.h.

702, 703. *Advanced Reading.* Like Greek 701, either as a continuation of it or as separate courses in other authors. Prereq.: Greek 603 or equivalent, or consent of the Supervisor of Classical Studies. 3 + 3 q.h.

HEALTH AND PHYSICAL EDUCATION

Associate Professors Carson (chairman), Beede, Ringer; Assistant Professors Baret, Connelly, D. Hunt, Kocinski, Laborde, Liptak, Podoll, Robinette, and Rosselli; Instructors Johnson, Ramsey, Reilly and Zboray.

The Department of Health and Physical Education offers two types of courses: (1) those through which the general requirement in health and physical education is met; (2) those designed for the professional preparation of teachers of health education and/or physical education.

I. Required Courses

Every student seeking a degree from Youngstown State University must earn a minimum of nine quarter hours of credit in health and physical education. Of these, three quarter hours are in Health 509c; the other six, normally, are in physical activity courses, each providing one quarter hour of credit. The six 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 military service must consult with the Chairman of the Department of Health and Physical Education.*

The form of activity is chosen by the student; previous experience in it is not necessary. For men it may, and for women it must, differ each quarter. Members of the varsity baseball, basketball, football, golf, swimming, tennis, rifle, and track and field squads may receive physical activity credit through such participation.

Men and women day students are scheduled for Health and Physical Education 509C. Activity courses may be taken separately or coeducationally, depending on the activity. A woman student purchases the required uniform through the women's section of the department; a male student participating in any 525M activity course must purchase the required uniform through the men's section of the department. Most of the other equipment for required 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 teacher before buying new equipment.

If a student is excused from the regular activity courses for any reason, the chairman of the department may substitute suitable courses. Evening students are ordinarily permitted such substitution if they prefer it. Handicapped students and those needing remedial work receive special attention.

Lower Division Courses Meeting the General Requirement For Men

Activity courses:

516M. *Varsity Football.* Course requirements are met by participating for a season as a member of the intercollegiate football squad. 1 q.h.

517M. *Varsity Basketball.* Course requirements are met by participating for a season as a member of the intercollegiate basketball squad. 1 q.h.

518M. *Varsity Baseball.* Course requirements are met by participating for a season as a member of the intercollegiate baseball squad. 1 q.h.

519M. *Varsity Track and Field.* Course requirements are met by participating for a season as a member of the intercollegiate track squad. 1 q.h.

520M. *Varsity Golf.* Course requirements are met by participating for a season as a member of the intercollegiate golf squad. 1 q.h.

521M. *Varsity Tennis.* Course requirements are met by participating for a season as a member of the intercollegiate tennis squad. 1 q.h.

522M. *Varsity Swimming I.* Course requirements are met by participating for a season as a member of the intercollegiate swimming squad. 1 q.h.

523M. *Varsity Rifle.* Course requirements are met by participating for a season as a member of the intercollegiate rifle squad. R.O.T.C. detachment. 1 q.h.

525M. *Gymnasium Sports.* Calisthenics and one or more of the following: basketball, soccer, softball, squash, swimming, touch football, volleyball. Two hours a week, at the Y.M.C.A. 1 q.h.

526M. *Beginning Wrestling.* Elements of wrestling, for Health and Physical Education majors or minors. 1 q.h.

545M. *Beginning Swimming.* Adjustment to the water: fundamental skills; elementary back-stroke and front-crawl; elementary water safety. Open only to non-swimmers. 1 q.h.

546M. *Intermediate Swimming I.* Proper form of elementary back-stroke, breast-stroke, side-stroke, back-crawl, and front-crawl; elementary diving, with an introduction to the balance of the nine basic styles of swimming including inverted breast stroke, overarm side stroke, single trudgeon stroke and trudgeon crawl. Form, endurance, and personal safety are emphasized. Prereq.: Health and Physical Education 545M. 1 q.h.

547M. *Intermediate Swimming II.* A review and continuation of Intermediate Swimming I, with additional consideration of the proper form of the nine basic swimming styles: emphasis on surface diving, treading water, turning and diving from the one-meter board; further emphasis on endurance and personal safety. Prereq.: Health and Physical Education 546M. 1 q.h.

548M. *Advanced Swimming.* Continuing the nine basic styles of swimming, with emphasis on form and perfection of each stroke, and a consideration of plain and fancy diving and swimming, including personal safety. Prereq.: Health and Physical Education 547M, or the equivalent. 1 q.h.

Coeducational

509C. *Health Education.* Personal health, mother and child care, and good community living, including a study of such common disorders as heart disease, cancer, tuberculosis, and other communicable diseases and their control. Identical with Health and Physical Education 509M and 509W. 3 q.h.

613C. *Sports Appreciation.* The rules, mechanics, skills, social benefits, contemporary status, and other aspects of baseball, football, golf, tennis, skiing, sailing, fishing, and many other sports. 3 q.h.

614C. *Foundations of Physical Education.* The meaning and objectives of Physical Education. Analyzing fitness and activity problems so that the learner may have a more general knowledge and understanding about physical fitness in our day-to-day living. 3 q.h.

Activity courses:

502C. *A, B, C, D, Adapted Activities.* Designed for students restricted from participation in the general program. Physical activities and recreational games are adapted to individual needs and capacities. Prereq.: recommendation of a physician and consent of department chairman or assistant department chairman. 1 q.h.

530C. *Archery.* Techniques of target archery. Consideration is also given to the selection, care, and repair of equipment. 1 q.h.

531C. *Badminton.* The skills, mechanics, and rules of badminton. 1 q.h.

532C. *Beginning Badminton and Archery.* The beginning skills and rules of badminton and of target archery. 1 q.h.

534C. *Beginning Fencing.* Fundamentals of foil fencing. Basic techniques of attack and parry, and elements of bouting and officiating. 1 q.h.

535C. *Intermediate Fencing.* To present the basic fundamentals of offense and defense and to develop an understanding of the simple direct and indirect attacks to various areas of the body. 1 q.h.

537C. *Beginning Tennis.* The skills, mechanics, and rules of tennis, with emphasis on the doubles game. 1 q.h.

540C. *Golf.* Fundamentals for beginning and intermediate golfers. 1 q.h.

555C. *Folk and Square Dance I.* European folk dances and American square and couple dances. Stress is placed on the schottische, waltz, polka, and two-step. 1 q.h.

556C. *Folk and Square Dance II.* A continuation of Health and Physical Education 555C. Folk dances of the intermediate and advanced levels are emphasized. Prereq.: Health and Physical Education 555C, or consent of teacher. 1 q.h.

557C. *Beginning Tap Dance.* Basic tap technique for the beginner. 1 q.h.

560C. *Intermediate Modern Dance.* A continuation of Health Education and Physical Education 559W. Consideration is given to problems in composition. Prereq.: Health and Physical Education 559W, or consent of teacher. 1 q.h.

For Women

Activity courses:

500W. *Physical Activity: Field Hockey.* Techniques and rules of field hockey. Basic activity program. 1 q.h.

501W. *Physical Activity: Soccer.* Techniques and rules of soccer. Basic activity program. 1 q.h.

502W. *Physical Activity: Volleyball.* Techniques and rules of volleyball. Basic activity program. 1 q.h.

503W. *Physical Activity: Basketball.* Techniques and rules of basketball. Basic activity program. 1 q.h.

504W. *Physical Activity: Softball.* Techniques and rules of softball. Basic activity program. 1 q.h.

520W. *A, B, C, D Adapted Activities.* Designed for students restricted from participation in the general program. Physical activities and recreational games are adapted to individual needs and capacities. Prereq.: recommendation of a physician and consent of the assistant department chairman. 1 q.h.

530W. *Archery.* Techniques of target archery. Consideration is also given to the selection, care, and repair of equipment. 1 q.h.

531W. *Badminton.* The skills, mechanics, and rules of badminton. 1 q.h.

532W. *Beginning Badminton and Archery.* The beginning skills and rules of badminton and target archery. 1 q.h.

533. *Beginning Bowling.* Fundamentals of bowling, including equipment selection, use of the straight ball delivery, and scoring. For the inexperienced bowler. 1 q.h.

534W. *Beginning Fencing.* Fundamentals of foil fencing. Basic technique of attack and parry, and elements of bouting and officiating. 1 q.h.

536W. *Gymnastics, Apparatus, Stunts, and Tumbling.* Gymnastic exercises, stunts, and tumbling activities. Instruction in apparatus includes the buck horse, box, rings, ropes, balance beam, trampoline, and even and uneven parallel bars. 1 q.h.

537W. *Beginning Tennis.* The skills, mechanics, and rules of tennis with emphasis on the doubles game. 1 q.h.

545W. *Beginning Swimming.* Adjustment to the water, fundamental skills, elementary backstroke, side stroke, front crawl, and elementary water safety. For non-swimmers. 1 q.h.

546W. *Intermediate Swimming I.* Proper form of the elementary back stroke, side stroke, breast stroke, back crawl and front crawl, elementary diving, and personal safety. Prereq.: Health and Physical Education 545W or the equivalent. 1 q.h.

547W. *Intermediate Swimming II.* Continuation of Intermediate Swimming I, with consideration given to the proper form for the trudgeon, trudgeon crawl, overarm sidestroke, inverted breast stroke, and the variations of the nine basic styles of swimming. Emphasis is placed on improving endurance as well as form. Prereq.: Health and Physical Education 546W, or the equivalent. 1 q.h.

548W. *Advanced Swimming.* Synchronized swimming and elements of plain and fancy diving, including the competitive aspects of swimming and diving. Prereq.: Health and Physical Education 547W or the equivalent. 1 q.h.

555W. *Folk and Square Dance I.* European folk dances and American square and couple dances. Stress is placed on the schottische, waltz, polka and two-step. 1 q.h.

556W. *Folk and Square Dance II.* A continuation of Health and Physical Education 555W. Folk dances of the intermediate and advanced levels are emphasized. Prereq.: Health and Physical Education 555W, or consent of teacher. 1 q.h.

557W. *Beginning Tap Dance.* Basic tap technique for the beginner. 1 q.h.

559W. *Beginning Modern Dance.* Fundamental movement techniques, elements of rhythmic and musical patterns. Basic composition. 1 q.h.

560W. *Intermediate Modern Dance.* A continuation of Health and Physical Education 550W. Consideration is given to problems in composition. Prereq.: Health and Physical Education 559W or consent of teacher. 1 q.h.

II. Professional Courses

Youngstown State University is fully approved by the Ohio State Department of Education for the preparation of health and physical education teachers for public

schools. The major may be in either health education or physical education.

Lower Division Courses For Men

650M. *Life-Saving Methods.* Techniques of basic and advanced survival swimming, with American Red Cross methods as the basis of instruction. Upon satisfactory completion, Red Cross and Y.M.C.A. senior life saving certification is granted. Prereq.: Health and Physical Education 547M, or consent of teacher. 3 q.h.

660M. *Skin and Scuba Diving.* Basic skin diving, using mask, fins, and snorkel. Scuba includes using tank and regulator, with emphasis on diving physics, diving physiology, planning, rescue, first aid, and safety skills. Skin and Scuba certification is granted upon successful completion of the course. Four class hours a week. Prereq.: Health and Physical Education 650 M, or current certification as a senior lifesaver. 3 q.h.

Upper Division Courses

709M. *Intramural Sports: Organization and Administration.* The principles and problems of conducting an intramural sports program, including pupil participation, awards, tournaments, types of officiating, publicity, sportsmanship, and other details. 3 q.h.

711M–712M–713M. *Teaching of Individual and Dual Sports.* Methods of playing and teaching various individual and dual sports, including tennis, badminton, fencing, free exercise, stunts, tumbling, apparatus activities, and archery. Prereq.: sophomore standing. 3 + 3 + 3 q.h.

750M. *Water Safety Methods for Instructors.* Techniques of organizing and teaching swimming, diving, and life-saving activities. Red Cross instructor's certificate is awarded upon satisfactory completion. Prereq.: current certification as Red Cross Senior Life Saver. 3 q.h.

769M. *Camping.* This course is designed to give the student experience in outdoor living and an insight into problems of camping trips. Particular attention is given to the care and handling of camping equipment, canoeing, outdoor cooking, study of wildlife, fishing, and fire prevention and control, as well as selection and preparation of camp sites. Prereq.: consent of teacher. 3–6 q.h.

770M. *Theory of Camp Counseling.* Camp administration, program planning, objectives, and campcraft as related to camp leadership. Trips to nearby camps and camp sites afford practical experience. Prereq.: consent of teacher. 3–6 q.h.

771M. *Practice of Camp Counseling.* Application of camp leadership skills is emphasized. Supervised counseling experience is afforded the student through cooperation with nearby camps. Prereq.: Health and Physical Education 770M and consent of instructor. 3–9 q.h.

803M. *Health and Physical Education: Organization and Administration.* Study and practice of techniques involved in the organization and administration of the school health education and physical education program. Prereq.: Health and Physical Education 703C. 5 q.h.

807M. *Teaching and Coaching of Football.* Prereq.: Health and Physical Education 712M. 3 q.h.

808M. *Teaching and Coaching of Basketball.* Prereq.: Health and Physical Education 712M. 3 q.h.

809M. *Teaching and Coaching of Baseball.* Prereq.: Health and Physical Education 712M. 3 q.h.

810M. *Teaching and Coaching of Track and Field.* Prereq.: Health and Physical Education 712M. 3 q.h.

827M. *Seminar in Athletics.* Study of special problems pertaining to athletics. Prereq.: senior standing. 3 q.h.

835M–836M–837M–838M. *Techniques of Officiating.* Qualification of officials; techniques of officiating; interpretation of rules and opportunity to qualify for such ratings as are possible in the sport activities offered. Emphasis will be on football, basketball, baseball, and track. Prereq.: Junior standing and consent of department chairman. 2 + 2 + 2 +2 q.h.

Lower Division Courses For Men and Women

600C. *Introduction and History of Health, Physical Education, and Recreation.* A content survey of the areas of health, physical education, and recreation. Introduction to professional preparation. Prereq.: Departmental Advisement. 3 q.h.

601C. *Prevention and Care of Athletic Injuries.* Practical and theoretical aspects of treatment of athletic injuries in an athletic program; supplies, training table, therapeutic equipment and techniques in conditioning, taping, and bandaging. Prereq.: Approval of Health and Physical Education Department. 3 q.h.

602C. *First Aid and Care of Athletic Injuries.* Accident prevention and first aid procedures, especially for injuries common in physical activities. Principles and methods of athletic taping. The American Red Cross manual is followed. Standard, advanced, and instructor's certification are granted upon satisfactory completion. 3 q.h.

703C. *Principles of Health and Physical Education.* The historical development of and the biological, sociological, psychological, and educational principles related to the field of health education and physical education. Prereq.: Biology 500–501–502 or 503–504, Psychology 602, and junior standing. 4 q.h.

706C. *Advanced Health Education.* Personal and community health, disease control, mental and social hygiene, nutrition and family living. The course includes materials necessary for teachers of school health and hygiene courses. Prereq.: standing as sophomore health education or physical education major or minor. 5 q.h.

707C. *Community Health Agencies.* The administrative interrelationships of special agencies dealing with community health. Prereq.: Health and Physical Education 706C. 4 q.h.

719C. *Methods in Teaching Rhythmic Activities I.* Rhythm and movement fundamentals; methods and materials of teaching folk, square, and social dance. Prereq.: Health and Physical Education 712M or 712W. 4 q.h.

721C. *Health Education in Elementary Schools.* Methods and materials for health instruction; use and administration of health services; maintenance of health factors in the schoolroom; recognition of common disorders in children. Prereq.: junior standing and Health and Physical Education 509. 3 q.h.

722C. *Physical Education for Elementary Grades.* Study of an extensive program of low-organization games, rhythms, plays, and stunts, their purposes, and methods of teaching them to children. The teacher-in-training learns the games and participates in them. Prereq.: sophomore standing. 3 q.h.

804C. *Playgrounds: Organization and Administration.* Study and practice of techniques involved in the organization and administration of playgrounds. Prereq.: junior standing. 5 q.h.

805C. *Recreational Activities: Organization and Administration.* The relation of physical education to recreation. The principles and aims of recreation; finding material for recreational group activities, and organizing and administering them. Prereq.: junior standing. 5 q.h.

815C. *School Health Education.* Principles, curriculum planning, teaching methods, evaluation, organization and administration of health education in elementary and secondary schools. Prereq.: Health and Physical Education 706C. 6 q.h.

817C. *Kinesiology and Applied Anatomy.* Muscular structure and function in relation to physical movement; analysis of fundamental movements. Prereq.: Biology 600–601 and 602. 3 q.h.

818C. *Remedial and Corrective Physical Education.* The organization of physical education activities selected to meet the individual needs of the atypical student. Consideration of such atypical conditions as posture, cardiac, and foot defects, dysmenorrhea, post-operative cases, certain orthopedic conditions, defects of sight and hearing and mental handicaps. Evaluation of therapeutic exercises and activities. Prereq: Health and Physical Education 817C. 3 q.h.

821C. *Physiology of Exercise.* Designed to establish a sound basis of physiological principles on the various systems and organs of the body during muscular activity. Requirement: Undergraduate-Graduate Program. Prereq.: Biology 600–601–602. 4 q.h.

822C. *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. Requirement: Undergraduate-Graduate Program. Prereq.: senior standing. 5 q.h.

825C. *Seminar in Physical Education.* Study of special problems pertinent to physical education. Prereq.: senior standing. 3 q.h.

826C. *Seminar in Health Education.* Study of special problems pertinent to health education. Prereq.: senior standing. 3 q.h.

828C. *Normal and Physical Diagnosis.* Study of common physical deficiencies and defects that influence physical, mental, and social development. Techniques of conducting health examinations, clinical services, and other procedures. Prereq.: Health and Physical Education 818M or 818W. 3 q.h.

865C. *Communicable Diseases.* The study of common communicable diseases and regional health problems; a study of pathogenic bacteria, protozoa, parasitic worms, and insect or arthropod vectors of diseases; a consideration of factors in and methods of control of human communicable diseases. Three one-hour discussion and three one-hour periods of demonstration and laboratory study a week. 5 q.h.

866C. *Public Health and Sanitation.* The study of community problems in sanitation and public health; a study of community health institutions and agencies, including water supply and distribution, sewage disposal, milk and restaurant inspection, school and public health nursing programs; study of special wards, hospitals, and clinics for the care and treatment of communicable diseases. Two three-hour periods of field work and experience a week, to provide for adequate field observation and training in

recognition of communicable diseases and problems. 3 q.h.

Lower Division Courses For Women

650W. *Life-Saving Methods.* Techniques of life-saving, with American Red Cross methods as the basis of instruction. Upon satisfactory completion, Red Cross certification is granted. Three class hours a week. Prereq.: consent of teacher. 2 q.h.

Upper Division Courses

711W–712W–713W. *Teaching of Individual and Dual Sports.* Methods of playing and teaching various individual and dual sports, including tennis, golf, badminton, bowling, fencing tactics, free exercise, stunts, tumbling, apparatus activities, archery, and recreational games. Prereq.: sophomore rank. 3 + 3 + 3 q.h.

750W. *Water Safety Methods for Instructors.* Techniques of organizing and teaching swimming, diving, and life-saving activities. Red Cross instructor's certificate is awarded upon satisfactory completion. Prereq.: current certification as Red Cross Senior Life Saver. 3 q.h.

770W. *Theory of Camp Counseling.* Camp administration, objectives, activities, program planning, and campcraft as related to camp leadership. Trips to nearby camps and camp sites afford practical experience. Prereq.: junior standing and consent of teacher. 3–6 q.h.

771W. *Practice of Camp Counseling.* Application of camp leadership skills is emphasized. Supervised counseling experience is afforded the student through co-operation with nearby camps. Prereq.: Health and Physical Education 770W and consent of teacher. 3–9 q.h.

803W. *Health and Physical Education: Organization and Administration.* Study and practice of techniques involved in the organization and administration of the school health education and physical education program. Prereq.: Health and Physical Education 703C. 5 q.h.

811W–812W–813W. *Teaching of Team Sports.* The theory and practice of teaching field hockey, soccer, volleyball, basketball, softball, and track and field. Prereq.: Health and Physical Education 500W. 3 + 3 + 3 q.h.

820W. *Methods of Teaching Rhythmic Activities II.* Methods and materials of teaching modern dance. Prereq.: Health and Physical Education 819C. 4 q.h.

835W–836W–838W. *Techniques of Officiating.* The theory and practice of officiating in field hockey, soccer, volleyball, basketball, softball, and track and field. 2 + 2 + 2 q.h.

870W. *Seminar in Camp Administration.* Study of special problems pertinent to camp administration. Prereq.: senior standing. 3 q.h.

CURRICULUM

Curriculum for the Major in Health and Physical Education Leading to the Degree of Bachelor of Science in Education and an Ohio Provisional Special Certificate for Teaching Health and Physical Education in Grades K through 12.

First Year	Hrs.
*Biol. 500–501–502 Principles of Biology	9
Comm. 505–506–507 Basic Courses	9
Educ. 501 Intro. to Education	3
H. & P. E. 600C Introduction to and History of Health, Physical Education and Recreation	3
**Soc. Sci. 501–502–503 Intro. to the Soc. Sciences	9
Psych. 601 General Psychology	4
‡H. & P. E. 525 activity courses (3)	3
Orientation 500	1
†H. & P. E. 509C Health Education	3
Art 513, 514 or 605	3
	47

Second Year	Hrs.
Biol. 600–601–602 Anatomy and Physiology I & II & III	10
Comm. 508 Basic Course IV	3
English: Two 600-level literature courses or Humanities 631	6
H. & P. E. 601C First Aid and Care of Athletic Injuries	3
†H. & P. E. 706C Advanced Health Education	5
H. & P. E. 711M–712M–713M or 711W–712W–713W Teaching of Individual & Dual Sports	9
H. & P. E. 722C Physical Education for Elementary Grades	3
Hist. 601–602–603 The United States	9
Psych. 602 Psych. of Education	3
‡H. & P. E. 525 activity courses (3)	3
	54

* Students interested in biology as a teaching field must take Biology 503–504, 624–625, 627–628, 700 and 701, plus an elective in biology.

** The Social Science prerequisite for Psychology 601 is waived for Health and Physical Education majors, who take the courses concurrently.

‡ Women are required to take 500W, 501W, 502W, 503W, 504W and 536W. Additional activity courses may be required for competence in the major or minor field. A maximum of 6 quarter hours in activity courses may be counted toward the total needed for the degree.

† All students majoring in Health & Physical Education must take Health Education.

Third Year (Men)	Hrs.
Psych. 705 Child Psychology, or Psych. 706 Psych. of Adolescence	3
Educ. 704	3
Educ. 708 Educational Sociology	3
H. & P. E. 703C Principles of H.P.E.	4
H. & P. E. 707C Community Health Agencies	4

H. & P. E. 709M Intramural Sports	3
H. & P. E. 719C Teaching of Rhythmic Activities	4
H. & P. E. 770M Theory of Camp Counseling or 804C Playground Org. & Adm. or 805C Recreational Activities Org. & Adm.	5
H. & P. E. 807M Coaching Football 808M Coaching of Basketball 809M Coaching of Baseball 810M Coaching of Track and Field	12
H. & P. E. 817C Kinesiology and Applied Anatomy	3
H. & P. E. 818C Remedial and Corrective Physical Education	3
Electives	3–5
	50–53

Third Year (Women)	Hrs.
†Psych. 705 Child Psychology or Psych. 706 Psych. of Adolescence	3
Educ. 704	3
Educ. 708 Educational Sociology	3
H. & P. E. 703C Principles of H.P.E.	4
H. & P. E. 707C Community Health Agencies	4
H. & P. E. 719C Teaching of Rhythmic Activities	4
H. & P. E. 770W Theory of Camp Counseling	3
H. & P. E. 835W–836W–838W Techniques of Officiating	6
H. & P. E. 811W–812W–813W Teaching of Team Sports	9
H. & P. E. 817C Kinesiology and Applied Anatomy	3
H. & P. E. 818C Remedial Corrective, and Adapted Physical Education	3
	45

Fourth Year	Hrs.
Educ. 706 Principles of Teaching	3
Educ. 804 Supervised Student Teaching High School and Special Field	15
H. & P. E. 803M or 803W Health & Physical Education Org. & Adm.	5
H. & P. E. 815C School Health Education Org. & Adm.	6
H. & P. E. 820W Teaching of Rhythmic Activities II	4
Philosophy and Religion or Humanities	4
Psych. 708 Personality and Mental Hygiene	3
Electives	4–10
	44–50

Courses for the Minor in Health and Physical Education Leading to the Degree of Bachelor of Science in Education and an Ohio Provisional High School Certificate with a Teaching Field Limited to Teaching Health and Physical Education in Grades 7 through 12.

† Women may take Health and Physical Education 828C, Normal and Physical Diagnosis (3 quarter hours) instead of Psychology 705 or 706.

Course or Subject	Hrs.
Group A	
(Biological Life Sciences: Biology, Zoology, Comparative Anatomy, Human Anatomy, and Physiology)	
Biology 500–501–502 Principles of Biology	9
Biology 600 Anatomy and Physiology I	5
Biology 601 Anatomy and Physiology II	5
Group B	
(Principles, Organization, and Administration of Physical Education, including Athletics, Recreation, and Intramural Sports)	
Health and Physical Education 803M or 803W Organization and Administration of Health and Physical Education	3
Group C	
(Methods and Materials in Rhythms, Games of Low Organization, Stunts, Tumbling, Apparatus, Recreational Group Activities, and Elementary Activities)	
Health and Physical Education 711M–712M–713M or 711W–712W–713W Teaching of Individual and Dual Sports	9
Health and Physical Education 722C Physical Education for Elementary Grades	3
Group D	
(Methods and Materials in Dance, Football, Basketball, Baseball, Track, Tennis, Golf, Swimming, Soccer, Speedball, Volleyball, and Other Athletic Sports Commonly Used in Secondary and College Programs)	
Health and Physical Education 807M and 808M Teaching and Coaching of Football and Basketball (For Men)	3 + 3
Health and Physical Education 809M and 810M Teaching and Coaching of Baseball and Track and Field (For Men)	3 + 3
Health and Physical Education 811W–812W–813W Teaching of Team Sports (For Women)	9
Health and Physical Education 719C Teaching of Rhythmic Activities I	4
Group E	
(Principles, Organization, and Administration of School Health Education, including School and Community Relationships, Methods and Materials for Teaching Health, and Evaluation)	
Health and Physical Education 815C School Health Education	6
Group F	
(Personal and Community Hygiene, Nutrition, Disease Prevention and Control, Mental and	

Emotional Health, Accident Prevention and Control, Health Factors in Marriage, and Problems of Medical Care)

Health and Physical Education 601C
Prevention and Care of Athletic Injuries. 3
Health and Physical Education 602C
First Aid and Care of Athletic Injuries.. 3
Health and Physical Education 706C
Advanced Health Education 5

HEBREW

Lower Division Courses

501–502–503. *Elementary Hebrew.* Fundamental principles of grammar and reading of simple prose in preparation for reading narrative portions of the first books of the Old Testament. Introduction to elementary conversational Hebrew. No credit can be given for this course if the student has been given entrance credit for two years of high school Hebrew. Five class meetings. 4 q.h.

601, 602. *Hebrew.* Reading of selections from the Book of Genesis. Acquisition of a sufficient vocabulary for simple conversation in Hebrew. Five class meetings. Prereq.: Hebrew 503 or equivalent with a grade of C or better. 4, 4 q.h.

HISTORY

Professors David Behen and Roberts; Associate Professors Blue, Domonkos, Skardon, and Slavin; Assistant Professors Earnhart (acting chairman), Beelen, Berger, Darling, Lee, May, Ronda, Satre, 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 & Sciences Sections), a minimum of 45 quarter hours including History 601, 602, 603 and three courses from each of the three following groups:

Group A—History 651, 652, 653, 661, and 662.
Group B—History 611; courses numbered 700 to 749, and 801.
Group C—History courses numbered 750 to 799, and 851.

Students transferring 30 or more quarter hours in history to YSU from another institution must take at least five courses in Groups B or C 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.

601, 602, 603. *History of the United States I, II, III.* A general survey of the political, social, and economic development of the United States from the beginning of our history to the present. Listed also as Social Science 601, 602, 603. 3 + 3 + 3 q.h.

611. *Latin America.* A survey of Latin America from the European conquest to the present, emphasizing political, economic, cultural, and social developments. 3 q.h.

651, 652, 653. *History of Western Civilization.* The development of Western culture from its earliest appearance in the Near East down to the present day, with emphasis upon Europe. 3 + 3 + 3 q.h.

661. *Eastern Civilizations.* A brief survey of the Far East, Southeast Asia, the Middle and Near East, and North Africa, with emphasis on the nineteenth and twentieth centuries. 3 q.h.

662. *History of Asian Civilization.* A history of institutions and cultures of East and South Asia from Ancient times to the beginning of Western influences. Emphasis on traditional civilizations of India, China and Japan. 3 q.h.

Upper Division Courses

701. *Colonial America.* The settlement and development of Colonial America to the middle of the eighteenth century. Prereq.: History 601, 602, 603. 3 q.h.

702. *The Revolution and the Constitution.* A survey of the colonial background, the causes

and events of the Revolution, and the formation of the new Republic under the Constitution. Prereq.: History 601, 602, 603. 3 q.h.

704. *The Federal Period of American History.* An intensive study of the United States from the establishment of the national government to the rise of Jacksonian Democracy. Prereq.: History 601, 602, 603. 3 q.h.

706. *The Middle Period of American History.* An intensive study of the United States from the Jacksonian era to the eve of the Civil War. Prereq.: History 601, 602, 603. 3 q.h.

708. *The Civil War and Reconstruction.* An intensive study of military aspects: problems of the Confederacy; the political, social, and economic effects of the War on American society; and problems of reconstruction in both the North and the South. Prereq.: History 601, 602, 603. 3 q.h.

710. *The Emergence of Modern America.* Economic, social, political, and cultural history of the United States from Reconstruction to the Peace of Versailles, having as its major theme the transformation from a rural to an urban nation, and from a hemispheric to a world power. Prereq.: History 601, 602, 603. 3 q.h.

712. *Recent America.* The United States in modern times. The course is primarily concerned with domestic issues and emphasizes historical interpretation. Prereq.: History 601, 602, 603. 3 q.h.

714, 715, 716. *Economic History of the United States I, II, III.* An historical examination of the economy of the United States from the colonial to the modern period. Special emphasis is placed on such areas as agriculture, manufacturing, transportation and commerce, money and banking and business and labor organizations. Prereq.: History 601, 602, 603. 3 + 3 + 3 q.h.

717, 718, 719. *Constitutional History of the United States I, II, III.* The development of the American constitutional system from its English backgrounds to the contemporary era. Treatment emphasizes the formation, amendment, and interpretation of the Constitution of the United States. Prereq.: Social Science 501, 502. Prerequisite or concurrent: History 601, 602, 603. History 717 is prerequisite to 718, and 718 to 719. 3 + 3 + 3 q.h.

720, 721, 722. *Social and Cultural History of the United States I, II, III.* An examination of the social and cultural development of the United States with emphasis on the relationship between ideas and society. Attention is given to such areas as immigration, religion, education, family and social structure, painting, architecture, literature, and music. Prereq.: History 601, 602, 603. 3 + 3 + 3 q.h.

723, 724. *History of Ideas in America I, II.* An intellectual history of the American people, embracing such topics as liberty, democracy and social ideas. Prereq.: History 601, 602, 603. 3, 3 q.h.

730, 731. *The Negro in American History.* A historical study of the Negro's role in, and contributions to, the political, social, and economic development of the American Society from the colonial period to the present. Prereq.: 601, 602, 603. 3 + 3 q.h.

732, 733. *The West in American History, I, II.* A study of the advancing frontier in the United States and its effect on the political, economic, and social conditions of the country as a whole. Prereq.: History 601, 602, 603. 3 + 3 q.h.

735. *Urban History.* A survey of the history of cities in Western Europe and the United States to 1860. Prereq.: History 601, 602, 603. 3 + 3 q.h.

736. *Urban History of the United States.* The history of cities in the United States from 1860 to the present. Prereq.: History 735. 3 q.h.

738, 739. *The South in American History I, II.* The course begins with the late colonial period, when settlers were pushing across the southern Appalachians, and continues into the twentieth century. Special attention is given to local institutions, culture, economics, ideology, sectional politics, agriculture, and racial difficulties. Prereq.: History 601, 602, 603. 3 + 3 q.h.

741, 742. *Diplomatic History of the United States I, II.* A study of the development, trends, and problems of the foreign relations of the United States. Prereq.: History 601, 602, 603. 3 + 3 q.h.

744. *The History of American Business.* A study of American business in its historical setting from the colonial period to the present, with emphasis on the interaction of economic and political factors. Prereq.: History 601, 602, 603 or the equivalent, and junior standing. 3 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 United States history from colonial times to the Civil War. Prereq.: 18 hours of history or consent of instructor. 3 q.h.

746. *Readings in American History from 1865 to the Present.* An intensive study of the more important general works, monographs, and biographies dealing with the major problems in United States history from the Civil War to the present. Prereq.: 18 hours of history or consent of instructor. 3 q.h.

747. *History of the United States and Pennsylvania.* The history of the State of Pennsylvania with emphasis on its position in general American history. Prereq.: History 601, 602, 603. 3 q.h.

749. *Philosophy of History.* Identical with Philosophy 749.

751. *Byzantine History.* A survey of the development of the Byzantine state from the reign of Constantine to the fall of Constantinople in 1453. Prereq.: History 651. 3 q.h.

752. *History of Ancient Greece.* The development of the Greek World from earliest times to the end of the Hellenistic Age. Prereq.: History 651. 3 q.h.

753. *History of Rome.* The rise of the Roman State from earliest times to the end of the Principate. Prereq.: History 651. 3 q.h.

754. *Early Middle Ages.* History of Western Europe from the decline of Rome to the tenth century. Prereq.: History 652. 3 q.h.

755. *Late Middle Ages.* History of Western Europe from the tenth century to the waning of the Middle Ages. Prereq.: History 652. 3 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. Prereq.: History 652. 3 q.h.

759. *The Reformation.* The History of Europe from the Lutheran Revolt to the Peace of Westphalia in 1648. Prereq.: History 652. 3 q.h.

760. *From Westphalia (1648) to the French Revolution.* Europe from the Peace of Westphalia (1648) to the outbreak of the French Revolution (1789). The emphasis is on the age of Louis XIV and the Old Regime in France. Prereq.: History 652, 653. 3 q.h.

761. *French Revolution and Napoleon.* The French Revolution and Napoleon Bonaparte, 1789–1815. Deals with a variety of Parisian revolutions, rise of political clubs, bourgeois and sans-culotte, rise and fall of Napoleon. Prereq.: History 653. 3 q.h.

765. *Europe from the Congress of Vienna to the Franco-Prussian War.* Europe from Congress of Vienna to the Franco-Prussian War (1815–1871). Such movements as nationalism, the impact of the Industrial Revolution, Marxism, growth of democracy, liberalism and conservatism, Romanticism and realism, reform and revolution, from the main themes of this period. Prereq.: History 653. 3 q.h.

766. *Europe from the Franco-Prussian War to World War I.* Europe from the establishment of the German Empire to the outbreak of World War I. Imperialism, socialism, the new science, constitutional developments, social and political reforms, economic growth, diplomatic alignments are principal topics of this period. Prereq.: History 653. 3 q.h.

767. *Europe from World War I to the Present.* Europe from the first World War (1914) to the present. The impact of the Russian Revolution, the rise of modern totalitarianism, problems of the western states, economic crisis and recovery, political and diplomatic relations form the basic themes of this course. Prereq.: History 653. 3 q.h.

771. *History of China to 1912.* History of China through the end of the Dynastic Era, with emphasis on the late nineteenth century developments and their implications. Prereq.: History 662. 3 q.h.

773. *History of Japan & Korea to 1895.* History of the early development of Japan and Korea, with an examination of the modernization movement in Japan. Prereq.: History 662. 3 q.h.

774. *History of the Far East in Modern Times.* Political, economic, social, and intellectual development in China and Japan during the twentieth century and their respective roles in contemporary Asia. Prereq.: History 662. 3 q.h.

775. *History of the South and Southeast Asia in the Nineteenth and Twentieth Century.* A history of the indigenous cultures, colonial background and developments in the nineteenth and twentieth centuries. Prereq.: History 662. 3 q.h.

777, 778. *History of the Russian Empire, I, II.* A detailed study of the history of the Russian Empire from the establishment of the Romanov dynasty to the dissolution of the Empire. Prereq.: History 651, 652, 653. 3 + 3 q.h.

779. *History of the Soviet Union.* A study of the history of the territories under the Bolshevik regime from the proclamation of the Bolshevik state to the present time. Prereq.: History 651, 652, 653. 3 q.h.

780, 781. *History of Eastern Europe I, II.* A study of eastern Europe from—the beginnings of civilization to the present. Varying fortunes of the Finnish, Lithuanian, Ukrainian, Polish, Slovak, Russian and North-Caucasian nations are examined closely against the background of the other Slav, Balto-Lithuanian, Finno-Ugrian and Caucasian nations. Prereq.: History 651, 652, 653. 3 + 3 q.h.

782. *History of the Balkans.* History of Southeastern Europe from the fourth century to the present, with particular attention being

given to Bulgaria, Serbia, Rumania, Croatia, and Greece within Southeastern Europe. Prereq.: 651, 652, 653. 3 q.h.

783, 784, 785. *Economic History of Europe I, II, III.* Rural and town economy in the Middle Ages; the transition to capitalism; development of modern industrial society. Prereq.: History 652, 653. 3 + 3 + 3 q.h.

786. *Expansion of Europe to 1815.* Lectures and readings on the economic development of Europe after 1300, the oceanic discoveries, the colonial systems of the European countries, the influence of European expansion on non-European peoples, and the theories of the mercantilists. Prereq.: 9 hours of history or consent of teacher. 3 q.h.

787. *Population Movements.* Trends in world population in their relation to history, migration and urbanization. Human demography and ecology: various measurements of the size, density, and distribution of population as well as their economic and social environments. Prereq.: junior standing (listed also as Economics 787 and Sociology 787). 4 q.h.

788. *American Population Movement.* A history of the Atlantic migration and its social, political, and economic effect on American environments. Prereq.: junior standing. 3 q.h.

789, 790, 791. *English History I, II, III.* From the earliest times to the present, with emphasis on social, industrial, and commercial development, the growth of parliament, the contest for religious freedom, and the literary and intellectual development of the British people. Prereq.: History 651, 652, 653. 3 + 3 + 3 q.h.

792, 793. *British Empire and Commonwealth I, II.* A study of the development of the British Empire from 1783 stressing India, Africa, Australia and Canada. Movements emphasized are the development of colonial institutions, the formulation of British colonial policy, the growth of colonial nationalism, the evolution of the Commonwealth. Prereq.: History 651, 652, 653. 3 + 3 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.: History 651, 652. 3 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. Prereq.: consent of teacher. 3 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. Prereq.: consent of teacher. 3 q.h.

HOME ECONOMICS

Associate Professor McMillan; Assistant Professor Feldmiller (chairman).

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.

To meet the requirements for a Bachelor of Arts degree with the major in home economics, the student must meet the general requirements for that degree and must complete the following courses:

Biology 500, 501, 502, 604, 650.

Chemistry 505, 506, 507.

Home Economics 501, 501L, 503, 601, 602, 604, 701, 705, 706, 707, 712, 713, 714, 802, 803, 850.

For those who want to teach home economics in the secondary schools, courses are offered leading to the degree of Bachelor of Science in Education with a major in home economics. Such students, in addition to the general requirements for that degree, must complete the following courses:

Biology 500, 501, 502, 604, 650.

Chemistry 505, 506, 507.

Home Economics 501, 501L, 503, 601, 602, 604, 701, 705, 706, 707, 712, 713, 714, 800, 802, 803, 850.

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.

For the student interested in dietetics or nutrition, courses are offered leading to the degree of Bachelor of Science with the major in home economics. For this purpose the student, besides meeting all general requirements for the Bachelor of Science degree, must complete the following courses:

Biology 500, 501, 502, 604, 650.

Chemistry 505, 506, 507, 625, 626, 631, 712.

Home Economics 501, 501L, 601, 602, 709, 710, 711, 714, 807, 808, 809, 810, 811, 850.

Lower Division Courses

501. *Food and Nutrition.* The fundamentals of human nutrition as they apply to normal requirements. Study of the body's need for essential nutrients, the contributions of various food groups, the selection of an adequate diet, and the importance of diet in achieving and maintaining optimum health. 3 q.h.

501L. *Food and Nutrition Laboratory.* Application of the basic principles of nutrition in the selection and preparation of the foods commonly served for the three meals of the day. Experience in planning and preparing simple meals to provide an adequate diet. One two-hour laboratory period a week. Taken concurrently with Home Economics 501. 1 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. 5 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. Prereq.: Home Economics 501 and 501L. 5 q.h.

602. *Family Meal Planning and Service.* Principles of menu planning and table service for the family and for special occasions at various economic levels. One one-hour lecture and two two-hour laboratory periods a week. Prereq.: Home Economics 601. 3 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. 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. 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 lecture and two two-hour laboratory periods a week. Prereq.: Home Economics 604 and 701. 5 q.h.

703. *Tailoring.* A study of the fundamental techniques involved in the construction of tailored coats and suits. One hour lecture and two two-hour laboratory periods a week. Prereq.: Home Economics 604 and 701. 4 q.h.

705. *Child Psychology.* Identical with Psychology 705 except for the addition of directed observation. Home Economics 706 taken concurrently. 3 q.h.

706. *Child Development Laboratoy.* Observation in a nursery school and conferences with the Home Economics departmental staff; taken concurrently with Home Economics 705. 2 q.h.

707. *Psychology of Marriage and Family Relations.* Identical with Psychology 707. 3 q.h.

709. *Nutrition and Diet in Disease I.* Designed to broaden and extend the student's knowledge of the science of nutrition, with special emphasis on food nutrients, the metabolism of food, and recent advances in the field of nutrition. Prereq.: Biology 602, Chemistry 631, and Home Economics 602. 3 q.h.

710. *Nutrition and Diet in Disease II.* Continuation of Home Economics 709 with application to choice of foods. Prereq.: Home Economics 709. 3 q.h.

711. *Nutrition and Diet in Disease III.* The modifications and adaptations of normal diets to meet the special nutritional needs in abnormal conditions where choice of food is of particular importance. Prereq.: Home Economics 710. 3 q.h.

712. *Housing: Furnishings and Equipment I.* The fundamentals and principles 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. Two one-hour lectures and one two-hour laboratory period a week. Prereq.: consent of faculty. 3 q.h.

713. *Housing: Furnishings and Equipment II.* Consideration of needs and resources in arrangement of furnishings and equipment with emphasis on home lighting. Two one-hour lectures and one two-hour laboratory period a week. Prereq.: consent of faculty. 3 q.h.

714. *Housing: Furnishings and Equipment III.* 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. Two one-hour lectures and one two-hour laboratory period a week. Prereq.: consent of faculty. 3 q.h.

800. *Methods of Teaching Home Economics.* A study of the problems involved in teaching home economics in junior and senior high schools. Observation of teaching in the public schools. Prereq.: Education 706 and 15 hours of credit in home economics. 3 q.h.

802. *Home Management I.* Study of the home, its functions and operation, and the resources available. Two one-hour lectures, one two-hour laboratory period a week. Prereq.: Home Economics 714. 3 q.h.

803. *Home Management II.* Study of the home, its functions and operation, and resources recognized by the family. Two one-hour lectures, one two-hour laboratory period a week. Prereq.: Home Economics 802. 3 q.h.

807. *Institutional Equipment.* The selection of equipment for institutional food service with consideration of need, quality, cost and trends in the market. Prereq.: junior or senior standing with interest in dietetics or nutrition. 3 q.h.

808. *Institutional Marketing.* The selection and purchase of food for institutional food service with consideration of quality, quantity, cost and market practices. Prereq.: junior or senior standing with interest in dietetics or nutrition. 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. 3 q.h.

810. *Experimental Cookery.* Application of scientific principles and experimental procedures to cooking processes. 2 two-hour laboratory periods a week. Prereq.: Chemistry 631 and Home Economics 602. 3 q.h.

811. *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. 5 q.h.

850. *Seminar in Home Economics.* Required of all seniors majoring in home economics. Prereq.: senior standing and consent of faculty. 2 q.h.

HUMANITIES

The material of the six Upper Division courses in Humanities is drawn from the great writings of Western culture. The primary purpose of the readings is to arouse the students morally, intellectually, and aesthetically through the stimulus of these writings. An important secondary purpose is to acquaint them with a body of writing which has been extremely influential in the development of Western culture and to relate that material to the society in which it was produced and to our present society.

Full credit in all Humanities courses is acceptable toward a major in English. Credit in Humanities 631, 830, or 831 is acceptable toward a major in Latin at the discretion of the chairman of that department. Humanities 830, 831, and 832 give full credit toward the general requirement in religion.

At the discretion of the department chairman or supervisor concerned, limited credit in a Humanities 800-level course may be applied toward a major in history, philosophy, political science, or sociology, or the combined major in social studies. Should such a student be also majoring in English, he may apply the balance of the credit toward his English major.

A prerequisite for any Humanities course is English 508 (Communication IV), or its equivalent.

Lower Division Course

631. *Mythology in Literature.* An introductory study of myths, chiefly classical, with some attention to their origins and cultural significance and works of literature, both classical and modern, in which myths are used. Listed also as Classical Studies 631. 3 q.h.

Upper Division Courses

830. *Older Classics I: Ancient Drama and Poetry.* Extensive readings in English from most or all of the following (and perhaps others): Aeschylus, Sophocles, Euripides, Aristophanes, The Old Testament, Aristotle's *Poetics*, Menander, Plautus, Seneca. Prereq.: junior or senior standing. Listed also as Classical Studies 830. 4 q.h.

831. *Older Classics II: Ancient Prose and Poetry.* Extensive readings in English from most or all of the following (and perhaps others): The Old Testament, Homer, Herodotus, Thucydides, Plato, Aristotle, Lucretius, Cicero, Virgil, Greek and Roman lyric and elegiac poetry. Prereq.: junior or senior standing. Listed also as Classical Studies 831. 4 q.h.

832. *Older Classics III: Medieval and Renaissance.* Extensive readings in English from The New Testament, Augustine, Dante, Boccaccio, Petrarch, Pico della Mirandola, Chaucer, Machiavelli, Erasmus, More, Rabelais, Montaigne, Cervantes, and perhaps others. Prereq.: junior or senior standing. 4 q.h.

833. *Modern Classics I.* Extensive readings in English from most or all of the following (and perhaps others): Shakespeare, Calderon, Descartes, Milton, Molière, Racine, Spinoza, Locke, Pope, Fielding. Prereq.: junior or senior standing. 3 q.h.

834. *Modern Classics II.* Extensive readings in English from most or all of the following (and perhaps others): Rousseau, Lessing, Voltaire, Adam Smith, Gibbon, Goethe, Balzac, Mill, Thackeray, Meredith, Dostoevsky. Prereq.: junior or senior standing. 3 q.h.

835. *Modern Classics III.* Extensive readings in English from most or all of the following (and perhaps others): Tolstoy, Ibsen, Henry Adams, Hardy, William James, Shaw, Joyce, Thomas Mann, Proust. Prereq.: junior or senior standing. 3 q.h.

Combined Major in Humanities

The requirements for the combined major in Humanities are available in mimeographed form at the office of the Department of English.

ITALIAN

A major in Italian consists of 45 quarter hours above the elementary level or 36 quarter hours plus 9 hours in Latin. For a combined major in humanities, see *Humanities.*

Lower Division Courses

501–502–503. *Elementary Italian.* 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. No credit can be given for this course if the student has been given entrance credit for two years of high school Italian. Five class meetings. 4 + 4 + 4 q.h.

601. *Intermediate Italian.* Grammar reviewed through oral and written exercises. Reading of modern Italian prose and poetry. Five class meetings. Prereq.: C or better in Italian 503 or in second year high school Italian. 4 q.h.

602. *Intermediate Italian.* A continuation of Italian 601. Five class meetings. Prereq.: Italian 601 or equivalent. 4 q.h.

Upper Division Courses

701, 702, 703. *Survey of Italian Literature.* A survey of Italian literature from the Middle Ages to the present. Prereq.: Italian 602 or equivalent. 3, 3, 3 q.h.

715, 716, 717. *Conversational Italian.* Facility in oral expression developed through exercises and discussions of assigned topics and through prepared and extemporaneous situational dialogues. Prereq.: Italian 602 or equivalent. 3, 3, 3 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. 5 q.h.

719. *Advanced Italian Composition.* Skill in writing, developed through directed composition. Prereq.: Italian 718 or permission of the instructor. 3 q.h.

801. *Italian Literature of the Fourteenth Century.* Literature of Dante, Petrarca, and Boccaccio. Prereq.: Italian 701 or consent of the instructor. 3 q.h.

802. *Italian Renaissance.* Special attention given to Ariosto, Machiavelli, and Tasso. Prereq.: Italian 701 or consent of the instructor. 3 q.h.

803. *Italian Neoclassicism.* A study of the works of Parini, Alfieri, and Goldoni. Prereq.: Italian 702 or consent of the instructor. 3 q.h.

811. *Italian Romanticism.* A study of the Italian literature of the nineteenth century with particular attention to the poetical world of Foscolo and Leopardi. Prereq.: Italian 703 or consent of the instructor. 3 q.h.

812. *The Italian Novel of the Nineteenth Century.* A study of the evolution of the novel with special attention to Alessandro Manzoni. Prereq.: Italian 703 or consent of the instructor. 3 q.h.

813. *Literature of New Italy.* A study of the Italian literature of the last thirty years of the nineteenth century with particular attention to the poetical world of Giosue Carducci. Prereq.: Italian 703 or consent of the instructor. 3 q.h.

821. *Italian Literature of the First 40 Years of the Twentieth Century.* A study of the major literary movements and political developments from the turn of the century through the Fascist State. Particular attention is given to G. D'Annunzio. Prereq.: Italian 813 or consent of the instructor. 3 q.h.

822. *Regional Italian Literature.* A study of Naturalism and Verism with particular attention given to G. Verga. Prereq.: Italian 813 or consent of the instructor. 3 q.h.

823. *Recent Italian Literature.* A study of the Italian literature of the last three decades. Prereq.: Italian 703 or consent of the instructor. 3 q.h.

864. *History of the Italian Language.* The evolution of Latin to Modern Italian from the standpoint of phonetics, morphology, syntax, and vocabulary. Prereq.: Italian 602 or equivalent. 3 q.h.

865, 866. *Comparative Romance Linguistics.* First course: The phonology and vocabulary of the chief Romance dialects. Second course: Morphology and syntax. Same as French and Spanish 865, 866. 3 + 3 q.h.

870, 871, 872. *Special Reading and Research.* Directed study on a central theme or thesis in Italian language or literature terminating in an examination, research paper, or both. Prereq.: Permission from the department head and the voluntary agreement of the instructor. 1–5, 1–5, 1–5 q.h.

873, 874, 875. *Seminar in Italian Language or Literature.* A seminar in problems in Italian literature or language. Prereq.: senior standing or permission of the instructor. 3, 3, 3 q.h.

876. *Study Abroad.* See the department chairman for details. Prereq.: Prior permission from the department head and major advisor. 1–15 q.h.

JOURNALISM

See *English.* Besides a major in English, the student of journalism should get a broad education in the liberal arts with emphasis on the social sciences and the humanities.

LATIN

A major in Latin consists of 27 hours of Latin on the Upper Division level, including Latin 804, plus 18 hours of Latin, ancient Greek, and/or other courses acceptable in relevance and level to the Supervisor of Classical Studies. The inclusion of at least 9 hours of ancient Greek is strongly recommended.

Students who plan to teach high school Latin must complete 27 hours of Latin beyond elementary Latin, or 18 hours beyond intermediate Latin, and must include Latin 804 and 809.

Freshmen may enter 700-level Latin courses if they can satisfy the prerequisite stated below for Upper Division Latin courses.

A student who wishes to complete a foreign language proficiency requirement in Latin, or to complete the prerequisite for 700-level Latin courses, proceeds as follows:

If he has had less than two years of Latin in high school, he takes Latin 501–502–503 and 601, 602, and 603.

If he has had two years of high school Latin, he takes Latin 601, 602, and 603. (He should read carefully the course description of Latin 601.)

If he has had three years of high school Latin, he normally takes Latin 601 and 603; but if his third high school year was *not* a Cicero course, he may take 602 instead of 603.

The student should read carefully what is said under *Proficiency in a Foreign Language,* near the beginning of the College of Arts and Sciences section. In cases of uncertainty or of unusual qualifications, the Supervisor of Classical Studies should be consulted.

Lower Division Courses

501–502–503. *Elementary Latin.* Essentials of Latin grammar and some readings of connected prose. Designed for pre-law students and majors in English and modern languages as well as for students planning to continue work in Latin. No credit can be given for this course if the student has been given entrance credit for two years of high school Latin; but see *Proficiency in a Foreign Language,* near the beginning of the College of Arts and Sciences section. Offered in the fall of odd-numbered years. 3 + 3 + 3 q.h.

601. *Intermediate Latin I.* A rapid review and expansion of elementary Latin grammar, with simple prose exercises, accompanied or followed by careful reading of miscellaneous selections. The student, especially if he had his elementary Latin in high school, is advised to review his Latin before beginning this course, or to allow himself time to review it intensively during the early weeks of the course. Prereq.: grade of C or better in Latin 503 or in the second semester of second-year high school Latin, or the consent of the Supervisor of Classical Studies. Offered every fall. 3 q.h.

602. *Intermediate Latin II.* Reading of selections from Cicero and possibly other writers. Prereq.: grade of C or better in Latin 601, or consent of the Supervisor of Classical Studies. Offered every winter. 3 q.h.

603. *Intermediate Latin III.* Introduction to Latin poetry. Reading of selections from Catullus, Ovid, and other poets. Prereq.: grade of C or better in Latin 601, or consent of the Supervisor of Classical Studies. Offered every spring. 3 q.h.

Upper Division Courses

The prerequisite for any 700-level Latin course is Latin 603 (or in certain cases 602), or four units of high school Latin, or the consent of the Supervisor of Classical Studies. The prerequisite for any 800-level course is at least

one 700-level Latin course and the consent of the supervisor of Classical Studies.

701. *Cicero I.* Selections from the *Letters*; limited composition based on review of case usage and the less complex mood and tense uses. 3 q.h.

702. *Pliny I.* Selections from the *Letters*; composition based on review of the more complex mood and tense uses. 3 q.h.

703. *Horace's "Odes".* Readings of selected odes. 3 q.h.

704. *Pliny II.* Selections from the *Letters*; limited composition based on review of case usage and the less complex mood and tense uses. 3 q.h.

705. *Cicero II.* Reading of the *De Senectute* or a comparable work, with composition based on review of more complex mood and tense uses. 3 q.h.

706. *Ovid.* Selections, mostly from the *Metamorphoses.* 3 q.h.

801. *Roman Historians I.* Readings principally from Livy. 3 q.h.

802. *Roman Historians II.* Readings principally from Tacitus. 3 q.h.

803. *Lucretius.* Selections from the *De Rerum Natura.* A study of Epicurean philosophy as presented by Lucretius. 3 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, or consent of teacher. 3 q.h.

805. *Roman Satire I.* Readings principally from Horace and Juvenal. The place of satire in Latin literature. 3 q.h.

806. *Roman Satire II.* Readings principally from Martial and Petronius, and possibly Persius. 3 q.h.

807. *Plautus.* Selected plays. 3 q.h.

808. *Terence.* Selected plays. 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, unless the department chairman approves its omission. 3 q.h.

810. *Advanced Readings.* Selections from one or more Latin writers, according to the needs or desires of the students. 1–4 q.h.

811. *History of Latin Literature I.* From its beginnings to the Golden Age, with selected readings. 3 q.h.

812. *History of Latin Literature II.* From the Golden Age to the Silver Age, with readings. 3 q.h.

813. *History of Latin Literature III.* From the Silver Age to the early Middle Ages, with readings. 3 q.h.

LINGUISTICS

The department of linguistics does not offer a major, but enables a student, with the advice and approval of his major adviser, to elect a minor in linguistics. The student planning such a minor should consult his adviser, 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 508 and Social Science 501, or their equivalents. Listed also as English 750. 4 q.h.

754. *Phonology.* An introduction to articulatory and acoustic analyses of speech sounds and their relevance to language functions. Prereq.: English 508 or its equivalent. Listed also as English 754 and Speech and Dramatics 754. 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.

760. *Applied French Phonetics.* Identical with French 760. 3 q.h.

855. *Semantics.* The study of relationships between language structure and its meanings, from the point of view of general linguistic analysis. Listed also as English 855. Prereq.: English 650 or Linguistics 755. 4 q.h.

860. *History of the German Language.* Identical with German 860. 3 q.h.

862. *History of the French Language.* Identical with French 862. 5 q.h.

864. *History of the Spanish Language.* Identical with Spanish 864. 3 q.h.

865, 866. *Comparative Romance Linguistics.* Identical with French 865, 866, Italian 865, 866, and Spanish 865, 866. 3 + 3 q.h.

867, 868. *Comparative Germanic Linguistics.* Identical with German 867, 868. 3 + 3 q.h.

MATHEMATICS

Professors Yozwiak (chairman) and Dillon; Associate Professors Banilower, Ciotola,

Demen, Hurd, Jonas, Malak, G. Mavrigian, and Santos; Assistant Professors Biles, Goldstein, Helling, Knauf, Subramanian, and Whipkey; Instructors Cleary, Kozarich, Mortellaro, Poggione, and Rodfong.

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 32 quarter hours are specified and 16 quarter hours are elective.

Specified courses include Mathematics 571, 572, 673, 674, 727, 740, 871, and 890.

Electives may be selected from any of the 700 and 800-level courses listed except as otherwise noted. Students preparing for secondary school teaching may substitute Education 800M (special methods-Mathematics) for Mathematics 890.

It is recommended that the student select his electives with assistance from his adviser. Certain courses are to be preferred to others according to whether one contemplates graduate study, secondary school teaching or a career in industry.

For the Bachelor of Science degree, the student majoring in mathematics must minor in physics, chemistry or biology and his foreign language must be French, German, Italian, or Russian. The candidate for the Bachelor of Arts degree may choose any minor and any foreign language.

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. degree. 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. Prereq.: two units of high school algebra, one unit of high school geometry or Mathematics 502. 3 q.h.

517. *Mathematics for Elementary Teachers.* The number system and the algorithms taught in elementary school mathematics; intuitive geometry; other topics. Required of all candidates for an elementary education certificate. 5 q.h.

518. *Real Number System.* An axiomatic discussion of the real number system for elementary teachers; elementary number theory. Prereq.: one unit of high school algebra, one unit of high school geometry and Mathematics 517 or consent of teacher. Offered every spring quarter. 4 q.h.

525, 526, 527. *Survey of Mathematics* (for Liberal Arts majors). A course for non-science majors emphasizing some of the basic ideas in mathematics, with stress on concept rather than on manipulatory skills. Prereq.: one unit of high school algebra and one unit of high school geometry, or Mathematics 500 and 501. 3 + 3 + 3 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. (formerly Bus. Org. 531). Prereq.: one unit of high school algebra or Math 500. 5 q.h.

540. *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. Prereq.: one unit of high school geometry, 2 units of high school algebra, or Math 502. 5 q.h.

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 Math 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 Math 502. 5 q.h.

571, 572, 673, 674. *Calculus I, II, III, IV.* An integrated course 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 Math 502 and 503. 5 + 4 + 5 + 4 q.h.

571H, 572H, 673H, 674H. *Calculus I, II, III, IV.* An honors course for selected students in analytic geometry and calculus with more emphasis on rigor than the regular course provides. A detailed study of limits, derivatives, and integrals of one and several variables and 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. 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 518. Offered every fall quarter. 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. Offered every winter quarter. 4 q.h.

654, 655. *Analytical Geometry and Calculus IV, V.* The last two quarters of a five term (5 quarters) sequence in calculus (551, 552, 653, 654, 655) to be offered for the last time during the academic year 1969–1970. Note that said sequence is to be replaced by the four term (4 quarters) sequence: 571, 572, 673, 674. Prereq.: Mathematics 653 or 654. 3 + 3 q.h.

654H, 655H. *Analytical Geometry and Calculus IV, V.* The last two quarters of a five term (5 quarters) sequence in honors calculus (551H, 552H, 653H, 654H, 655H) to be offered for the last time during the academic year 1969–1970. Note that said sequence is to be replaced by the four term (4 quarters) sequence: 571H, 572H, 673H, 674H. Prereq.: Mathematics 653H for 654H. 3 + 3 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 674 or consent of teacher. 4 q.h.

709. *Ordinary Differential Equations.* An introductory course in theory and solution of ordinary differential equations with applications. Prereq.: Mathematics 674. 3 q.h.

710, 711. *Higher Mathematics for Engineers and Physicists I and II.* Partial differential equations and boundary value problems; Laplace transform; vectors; Fourier series. Prereq.: Mathematics 709. 3 + 3 q.h.

725. *Matrix Theory and Linear Algebra.* Matrices; matrix operations; linear transformations; applications. Prereq.: Mathematics 653.

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. (formerly Math 721, 722, 723). Prereq.: Mathematics 673 or consent of teacher. 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, and 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 distributions, sampling distributions, estimation, tests of hypotheses, regression, and analysis of variance. Prereq.: Mathematics 674. 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, numerical solution of ordinary differential equations, 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.

845. *Operations Research.* An introduction to operations research: problem formulation, linear programming, queueing theory, and design of research. Emphasis on mathematical methods. Prereq.: Mathematics 742. 4 q.h.

846, 847, 848. *Theory of Probability I, II, and III.* The nature of probability theory; conditional probability; stochastic independence; binomial, Poisson, and normal distribution; laws of large numbers; limit theorems; generating functions; recurrent events; random walks; Markov chains; stochastic processes; applications. Prereq.: Mathematics 740. 3 + 3 + 3 q.h.

860. *Mathematical Logic.* An introduction to the study of theories in formalized languages and to the theory of models. Prereq.: Philosophy 620 and Mathematics 727 or consent of instructor. 4 q.h.

871, 872. *Advanced Calculus I and II.* An introduction to the theory of functions of real variables with a more critical presentation of the fundamentals of differential and integral calculus. Prereq.: Mathematics 674. 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 710 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.

MEDICAL TECHNOLOGY

Consult Chemistry Department for curriculum.

METALLURGY

See *Chemistry,* and the William Rayen School of Engineering section.

MILITARY SCIENCE

Lt. Colonel Stone (chairman) professor; Major Radvilas, Captain Chadbourne and Captain Solenberger, assistant professors.

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 and may apply for a Regular Army commission. Subject to quota limitations, students who are enrolled in R.O.T.C. and are in good academic standing are deferred from the military draft.

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 noncommissioned 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. The basic course is open to any male 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 $50.00 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¢ 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 Schools 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 a 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¢ 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; however, cadets in the two-year program are not eligible for R.O.T.C. scholarships.

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. *First Year Basic (Military Science I.)* Organization of the Army and R.O.T.C.; purpose and objectives of the R.O.T.C. program; history, policy, and organization of the local R.O.T.C. unit. Individual weapons and marksmanship; a brief resumè of the evolution of firearms; practical working knowledge of the

basic individual weapons and marksmanship training. One hour of lecture and one and a half hours of leadership laboratory (drill). 1 q.h.

502. *First Year Basic (Military Science I).* Introduction to the U.S. Army and national security; United States National Defense Policy, and world-wide commitments that require support of the Armed Forces; position of the Department of the Army in the national defense system. One hour of lecture and one and a half hours of leadership laboratory (drill). 1 q.h.

503. *First Year Basic (Military Science I).* U.S. Army and national security continued; comparison of the military forces of the world; mission, capabilities and interdependence of the U.S. Army, U.S. Navy and U.S. Air Force; role of the U.S. Army in conceivable types of warfare. One hour of lecture and one and a half hours of leadership laboratory (drill). 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.

600. *Second Year Basic.* American history; a survey of American history from 1607 to the present; factors which led to the organizational, tactical, logistical, operational, strategical and social patterns found in the present-day Army; the effect of political, economic and national security matters on military posture. (Identical with History 600). Four hours of lecture and one and a half hours of leadership laboratory. Prereq.: Military Science 503. 3 q.h.

601. *Second Year Basic (Military Science II).* Map and aerial photograph reading; a comprehensive study of the techniques employed in the use of maps and aerial photographs. One and a half hours of lecture and one and a half hours of leadership laboratory. Prereq.: Military Science 503, or active military service. 1 q.h.

602. *Second Year Basic (Military Science II).* 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 and a half hours of leadership laboratory. 3 q.h.

603. *Second Year Basic (Military Science II).* 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 and a half hours of leadership laboratory. 1 q.h.

Upper Division Courses

701. *First Year Advanced (Military Science III).* Leadership; the psychological, physiological, and sociological factors which affect human behavior; functional approach to the role of the leader, interaction between the leader of small military unit and subordinates, and responsibilities of the leader. Military teaching principles; 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. Three hours of lecture and one and a half hours of leadership laboratory (drill). Prereq.: Military Science 603, or active military service. 3 q.h.

702. *First Year Advanced (Military Science III).* 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. Three hours of lecture and one and a half hours of leadership laboratory (drill). Prereq.: Military Science 701. 3 q.h.

703. *First Year Advanced (Military Science III).* Branches of the Army; organization, function, and mission of the arms and services; operation of the various arms and services in the overall mission of the Army. Counterinsurgency; nature and causes of insurgency; concept of counterinsurgency operations; role of the U.S. Army in countering insurgency. One and a half hours of lecture and one and a half hours of leadership laboratory (drill). 1 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.: Military Science 703. 4 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. *Second Year Advanced (Military Science IV).* The military team; 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. Three hours of lecture and one and a half hours of leadership laboratory (drill). Prereq.: Military Science 703. 3 q.h.

802. *Second Year Advanced (Military Science IV).* Logistics; Army logistical policies, and procedures including supply, evacuation, maintenance, motor transportation, and troop movement; accounting for lost, damaged and destroyed property; combat logistics with emphasis on the employment of logistical organization. Principles and analysis of the nature of Internal Defense/Development, emphasizing tactical operations and civil affairs aspects. One and a half hours of lecture and one and a half hours of leadership laboratory (drill). 1 q.h.

803. *Second Year Advanced (Military Science IV.)* 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. Administration; the role of the junior grade Army officer in unit administration; familiarization with Army publications and administrative procedures. Categories of and organization for combat readiness as exemplified by the Army readiness program. Obligations, responsibilities, and benefits of commissioned service. Role of the U.S. in world affairs; 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 and a half hours of leadership laboratory (drill). 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 and a half 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 & IV

Courses 701, 702, 703, 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.

MODERN LANGUAGES AND LITERATURE

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

MUSIC

A major in the history and literature of music is acceptable for the degree of Bachelor of Arts. For the music courses for such

a major, see the Dana School of Music section.

Various courses at the Dana School of Music may be taken as electives by students in other units.

NATURAL SCIENCE

See *Biology*.

NURSING

Advisement for the undergraduate degree program for Registered Nurses is provided by the Department of Sociology.

Through the Degree Program for Registered Nurses, Registered Nurses will receive advanced credit for study at any accredited nursing school equal to one year of college study, either thirty semester hours or forty-five quarter hours. Half of this credit is for clinical work and half for class work. The latter will satisfy university requirements in science, hygiene and physical education while the former is recorded as general lower division courses. All other requirements for whatever degree is sought must be met, except the foreign language requirements for the Bachelor of Science degree.

For the two-year associate degree program in nursing, see the Technical and Community College section, page 226.

PHILOSOPHY AND RELIGIOUS STUDIES

Professor Greenman (chairman); Associate Professors J. R. Lucas, Reid, and Riley; Assistant Professor Eminhizer; Instructor Duritsa.

The four-hour general requirement in Philosophy and Religious Studies may be fulfilled by taking any four-hour course in this department as long as the student meets the prerequisites.

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 620, 621, 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. 3 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. Prereq.: Communications 508. 4 q.h.

620. *Classical Logic.* A critical analysis of classical logic from Aristotle to Boole; immediate inference and the syllogism, the fallacies, etc. 5 q.h.

621. *Introduction to Symbolic Logic.* An analysis and introduction to propositional logic, truth tables, logic of propositional functions, class logic, Venn diagrams, and expansion test for validity. 5 q.h.

622. *Inductive Logic.* An analysis of the logic of science, probability logic, with a consideration of hypotheses and their verification, scientific method, statistics and their employment, analogy and generalization. 5 q.h.

Upper Division Courses

700. *History of Ancient Philosophy.* The development of philosophic 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.

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 those 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.

714. *Social Philosophy.* Philosophical theories of the state and society, emphasizing the concepts of justice, community, and related ideas; consideration of the relation of the individual to the state. 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 651 or 652 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.

801. *Metaphysics.* The concept of being and reality in the major philosophic theories. Classical and Scholastic, Dialectical, Naturalist and Pragmatic, Analytic and Positivist, Existentialist and Phenomenologist. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

802. *Theories of Value.* Objectivist and Relativist theories of value; the major types of value and theories of the hierarchical arrangement of values. Prereq.: Philosophy 600 or junior or senior standing. 4 q.h.

803. *Symbolic Logic.* The structure and properties of axiomatic systems; the theory of propositional and relational logic; the algebra of classes; related topics. Prereq.: Philosophy 621. 5 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's *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.

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 or 832; 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 freshman. 3 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 the 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

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 and Communication 508. 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 and Communication 508. 3 q.h.

759. *Prophetic Religion.* A social and psychological analysis of the phophetic 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.: Communication 508 or junior or senior standing. 4 q.h.

760. *Biblical Studies I. Old Testament Literature.* A critical review of the religious and historical factors involved in the formation of the Old Testament canon. Prereq.: Communication 508 or junior or senior standing. 4 q.h.

761. *Biblical Studies II. Intertestamental Literature.* The Dead Sea Scrolls and other apocryphal literature. Prereq.: Communication 508 or junior or senior standing. 3 q.h.

762. *Biblical Studies III. New Testament Literature.* The development and canonization of Christian Literature. Prereq.: Communication 508 or junior or senior standing. 4 q.h.

765. *History of Religion I.* 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.: Communication 508 or junior or senior standing. 4 q.h.

766. *History of Religion II.* Living Oriental Religions. A continuation of Religious Studies 765, historically comparing the religions of China, Japan, India, and the Near East. Prereq.: Communication 508 or 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 601, 602, and 603. 4 q.h.

831. *The Psycho-Social Dynamics of Religion I.* 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. Several of the classic religions are studied. Prereq.: One of the following: Religious Studies 756, 757, 765, 766, Psychology 702, or Sociology 610. 4 q.h.

832. *The Psycho-Social Dynamics of Religion II.* The same considerations as in Religious Studies 831 applied to present day religious cults. Prereq.: One of the following: Religious Studies 756, 757, 765, 766, Psychology 702 or Sociology 610. Identical with Psychology 832 and Sociology 832. 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 (chairman), Julius and McLennan; Assistant Professors Dalbec, Fisher, Hanzely, Henkel, Mooney, Moorhead, and Young.

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-medical 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.

Lower Division Courses

501, 502, 503. *Fundamentals of Physics.* A three quarter sequence consisting of elementary mechanics, sound, heat, electricity and magnetism, and light. Not open to mathematics, chemistry, physics majors or to engineering students. Prereq.: One year of high school physics or Natural Science 520. Mathematics 502 and 503, or equivalent high school mathematics. 3 + 3 + 3 q.h.

501L, 502L, 503L. *Fundamentals of Physics Laboratory.* Two hours per week. Taken concurrently with Physics 501, 502, 503. 1 + 1 + 1 q.h.

510. *General Physics I.* The first of a four quarter sequence of introductory physics courses. A calculus concurrent course in mechanics: the kinematics and dynamics of masses in translation; Newton's Laws; the conservation laws; vectors. Prereq.: one year of high school physics or Natural Science 520. Prereq. or concurrent: Mathematics 571. 4 q.h.

601, 602, 603. *General Physics II, III, and IV.* A calculus prerequisite sequence consisting of the mechanics of rotational motion; simple harmonic motion; wave motion of light and sound; electricity and magnetism; and selected topics in modern physics. Prereq.: Physics 510. Prereq. or concurrent: Mathematics 572. 3 + 3 + 3 q.h.

Note: These three courses may be taken in any order after satisfactory completion of Physics 510.

601L, 602L, 603L. *General Physics Laboratory.* Three hours per week taken concurrently with Physics 601, 602, 603. These laboratories are elective courses for engineering students. 1 + 1 + 1 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. 4 q.h.

Upper Division Courses

Note: Satisfactory completion of the Physics sequence 510, 601, 602, 603, and Mathematics 674 is a general prerequisite for all upper division courses in Physics.

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. *Classical Mechanics.* 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 603. Prereq. or concurrent: Mathematics 710. 3 + 3 + 3 q.h.

704, 705. *Introduction to Modern Physics.* Selected topics in atomic, nuclear physics, special relativity, and nuclear reactions. 3 + 3 q.h.

704L, 705L. *Modern Physics Laboratory.* 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 lab. per week taken concurrently with Physics 704, 705. 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 Dept. or consent of instructor. 4 q.h.

710, 711, 712. *Thermodynamics and Statistical Mechanics.* An intermediate level course in the principles and theorems of thermodynamics as derived from directly observable, macroscopic quantities. Physics 712 continues with microscopic quantities; the statistical approach, kinetic theory, and limitations imposed by quantum mechanics. Prereq.: Physics 603. Prereq. or concurrent: Mathematics 710. 3 + 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 of optical instruments. Prereq.: Physics 603. 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.* 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 603 and Mathematics 709. 3 + 3 + 3 q.h.

730L, 731L, 732L. *Intermediate Level Electricity and Magnetism.* Laboratory work in A.C. circuits, steady state and transients, non-linear, circuit elements, and transducers. 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 in the area of field theory. Prereq.: Physics 702 and Mathematics 711. 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.* 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 and 704, 705 and senior standing. 2 + 2 + 2 q.h.

810, 811. *Introduction to Quantum Mechanics.* The postulates of wave mechanics, the Schroedinger wave equation, and solutions for elementary problems in quantum theory. Prereq.: Physics 702 and 705, Mathematics 711. 3 + 3 q.h.

820, 821, 822. *Electricity and Magnetism.* Static electric and magnetic fields. Time dependent fields and currents. Maxwell's equations, electromagnetic radiation. Vector methods are used extensively. Prereq.: Physics 603 and Mathematics 711. 3 + 3 + 3 q.h.

824. *History of Physics.* The great papers of physics as the subject matter for student research and investigation. Prereq.: consent of the chairman of the department. 4 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 709. 3 q.h.

826-L. *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. *Solid State Physics.* Selected topics in Solid State physics: crystal structure, mechanical, thermal, and magnetic properties of solids. 4 q.h.

835. *Spectroscopy.* Introduction to atomic, molecular, and x-ray spectra. 4 q.h.

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
Comm. 505 Basic Course	3
Chem. 515 General Chemistry	4
Math. 571 Analytic Geometry and Calculus I	5
H. & P. E. activity course	1

Winter Quarter	Hrs.
Physics 601 & 601L General Physics II	4
Comm. 506 Basic Course II	3
Math. 572 Analytic Geom. and Calculus II	4
Chem. 516 General Chemistry	4
H. & P. E. activity course	1

Spring Quarter	Hrs.
Physics 602 & 602L General Physics III	4
Comm. 507 Basic Course III	3
Math. 673 Analytic Geometry and Calculus III	5
Chem. 517 General Chemistry	4
H. & P. E. activity course	1

SECOND YEAR

Fall Quarter	Hrs.
Physics 603 & 603L General Physics IV	4
Soc. Sci. 501 Introduction to the Social Sciences	3
Math. 674 Analytic Geometry and Calculus IV	4
Comm. 508 Basic Course IV	3
H. & P. E. activity course	1

Winter Quarter	Hrs.
Physics 704 & 704L Introduction to Modern Physics	4
Soc. Sci. 502 Intro. to Economics	3
Math. 709 Ordinary Differential Equations	3
Foreign Language	4
H. & P. E. activity course	1

Spring Quarter	Hrs.
Physics 705 & 705L Introduction to Modern Physics	4
Soc. Sci. 503 Introduction to Political Sci.	3
Math. 710 Higher Math. for Engineers and Physicists I	3
Foreign Language	4
H. & P. E. activity course	1
H. & P. E. 509 Health Education	3

Minimum requirements for the B.S. in Physics: 60 quarter hours in Physics courses or any 45 hours after completion of the introductory sequence 510, 601, 602, 603.

Minimum requirements for the A.B. in Physics: 45 quarter hours in Physics courses, or any 30 hours after completion of the introductory sequence 510, 601, 602, 603.

Both degrees require a minor in Mathematics: A minimum of 21 quarter hours beginning with Math. 571.

The physics major is advised to pool his elective courses so as to obtain a second minor.

ASTRONOMY

Assistant Professor Young (supervisor).

A student who wishes to prepare for graduate work in astronomy should major in physics and minor in astronomy. A minor in astronomy should include Astronomy 507, 508, 509, 700, 701, 702, and 800.

Lower Division Courses

503. *Descriptive Astronomy.* A descriptive survey of the solar system and stars. Observations with the telescope. For the general student. 5 q.h.

507, 508, 509. *General Astronomy I, II, III.* A study of the celestial sphere, astronomical instruments, the earth, the other planets, the sun and stars, systems of stars and cosmology. 3 + 3 + 3 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 655 and Physics 603. 3 + 3 + 3 q.h.

800, 801. *Problems in Astronomy.* Special problems using the sixteen inch telescope and auxiliary equipment. Prereq.: recommendation of staff. 3 q.h.

POLICE SCIENCE

See *Criminology.*

POLITICAL SCIENCE

Associate Professors Boyer (chairman) and Sterenberg; Assistant Professors Eichenberger, Esterly, and W. Hunt; Instructors F. Costa, Gartland, Haushalter, Hudzik, Masloff, McKean, McKee, and Smathers.

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, 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 American Government.* An introduction to the fundamentals of American political theory and practice, with special attention to constitutional development. 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, the electoral system, and the formulation, execution, and review of public policy. 3 q.h.

602. *American State and Local Government.* A study of government and administration in the states and in local units of government, with emphasis on intergovernmental relations and the role of the citizen. 3 q.h.

640. *Elements of Comparative Government.* An inquiry into comparative politics, using as case studies the British and Soviet political systems. 3 q.h.

660. *Elements of International Relations.* An introduction to basic principles of international politics, law, and organization. 3 q.h.

680. *Elements of Political Theory.* An introduction to major twentieth century political ideologies, with emphasis on liberalism, socialism, communism, and fascism. 3 q.h.

Upper Division Courses

700. *American Executive.* An examination of the role of the chief executive officer within the governmental framework. The offices of mayor and governor are treated, but primary emphasis is on critical evaluation of the American presidency. Prereq.: Political Science 601. 3 q.h.

701. *American Legislative Process.* An examination of the lawmaking function. Attention is focused on the United States Congress, with limited consideration of state and local government legislative practices. Prereq.: Political Science 601. 3 q.h.

702. *American Judicial Process.* An examination of the American judicial system, its institutional development and its role in policy determination, as evidenced in leading Supreme Court decisions. Limited attention is given the state judicial systems. Prereq.: Political Science 601. 3 q.h.

703. *American Constitutional Law.* An inquiry into constitutional interpretation by the Supreme Court based on examination of leading cases, with particular attention to questions of federalism, executive power, civil liberties, and economic regulation. Prereq.: Political Science 702. 3 q.h.

704. *American Political Parties.* A descriptive analysis of the role of political parties in a democratic society, with emphasis on development of a theory of party and an examination of the history and characteristics of the American party system. Attention is given a quantitatively structured description of the national electorate. Prereq.: Political Science 601. 3 q.h.

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. 3 q.h.

720. *Public Administration.* Basic principles of public administration, with special consideration of the role of the public administrator in American society. Prereq.: Political Science 601. 3 q.h.

721. *Urban Government.* A comparative and critical analysis of urban governments, their institutional structure and politics. Attention is given problems of metropolitan political organization. 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 eco-

nomic development in the "underdeveloped areas." Prereq.: Political Science 640. 3 q.h.

743. *British Government and Politics.* An intensive study of governmental institutions and political behavior in the United Kingdom. Prereq.: Political Science 600, 601, or 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 600, 601, or 640. 3 q.h.

750. *Government and Politics—Africa.* Prereq.: Political Science 640, 742. 3 q.h.

751. *Government and Politics — Latin America.* Prereq.: Political Science 640, 742. 3 q.h.

752. *Government and Politics—Asia.* Prereq.: Political Science 640, 742. 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 with special emphasis on the United Nations in action. Prereq.: Political Science 660. 3 q.h.

780. *Political Thought I.* Political theories of the Greek period (Plato, Aristotle). Prereq.: Political Science 600 or 601 and junior standing. 3 q.h.

781. *Political Thought II.* Political theories of the medieval period and transition to modern (Machiavelli and Bodin). Prereq.: Political Science 600 or 601 and junior standing. 3 q.h.

782. *Political Thought III.* Political theories of the modern period, to mid-nineteenth century (to Karl Marx). Prereq.: Political Science 600 or 601 and junior standing. 3 q.h.

783. *Political Thought IV.* Political theories of the modern period, from Karl Marx to the present. Prereq.: Political Science 600 or 601 and junior standing. 3 q.h.

800. *Select Problems, American Government.* Prereq.: permission of department chairman. 3 q.h.

801. *Select Problems, Public Administration.* Prereq.: permission of department chairman. 3 q.h.

840. *Select Problems, Comparative Government.* Prereq.: permission of department chairman. 3 q.h.

860. *Select Problems, International Relations.* Prereq.: permission of department chairman. 3 q.h.

880. *Select Problems, Political Theory.* Prereq.: permission of department chairman. 3 q.h.

SOCIAL SCIENCE

Eighteen credit hours in courses in the social sciences are required of every student graduating from Youngstown State University; this requirement is met by taking the six courses listed below.

Candidates for the Bachelor of Engineering degree, however, need only twelve hours; and a student completing Military Science 501, 502, 503 and 601, 602, 603 and working toward any degree except a Bachelor of Engineering may omit Social Science 503.

A transfer student with less than two years but more than one year credit hours acquired elsewhere may omit Social Science 501, 502, 503, and a transfer student with sixty-four or more hours acquired elsewhere may omit all four courses, provided his credits include twelve hours in the social sciences at the time he graduates.

Students who have completed 101 under the semester system may complete the social science sequence by taking the course numbered 503.

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.

601, 602, 603. *History of the United States I, II, III.* Identical with History 601, 602, 603. 3 + 3 + 3 q.h.

Combined Major in Social Studies

The combined major in social studies is appropriate foundation for the study of law, for graduate work in any of the social sciences, and for entry into the civil service field. It can also fulfill requirements for teacher certification in the social sciences.*

In addition to the baccalaureate degree requirements of Social Science 501, 502, 503 and History 601, 602, 603, 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*

Youngstown State University offers a program in forestry in cooperation with the School of Forestry at Duke University. In completing 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 gets training in the liberal arts and in the 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 at the beginning of his freshman year. At the end of the first semester of his junior year he will be recommended for admission to Duke University if his cumulative point index is at least 3.0. His recommendation will be accompanied by his formal application for admission and a transcript of his academic record; no application for admission to Duke University need be made prior to that time.

Details concerning requirements and curriculums may be obtained from the supervisor of the department.

Lower Division Courses

503–504. *Principles of Forestry.* Introduction to forestry in the United States. Contribution of forestry to the national economy. Discussion of the principles of forestry management. To be offered only in the second and third quarters of each year. 503 is prerequisite to 504. 2 + 2 q.h.

603–604. *Introduction to Forestry.* To be taught only in the second and third quarters of the academic year. 603 is prerequisite to 604. 2 + 2 q.h.

Second Year

During the latter part of the second quarter of the first year the student will designate the subject matter field he wishes to pursue in the second year. Students who successfully complete the work of the first year will be assigned to a faculty advisory committee, who in consultation with the student, will develop his study plan for the second year. Qualified students may concentrate on the following areas:

Forest management
Forest business management
Silvics and silviculture
Forest influences
Forest economics
Forest-tree physiology
Mensuration and biometry
Forest soils
Wood anatomy
Physical and chemical properties of wood
Forest entomology
Forest pathology
Forest harvesting and utilization

* The student seeking teacher certification must choose history as one of his category A options, and must complete History 651, 652, 653.

* The Pre-Forestry program is part of the Department of Biology.

PRE-LAW STUDY

The student expecting to enter a school of law should consult Political Science Department advisers in planning either a combined major in social studies or a major of 45 hours in a department of the College of Arts and Sciences. In his junior year the pre-law student should check particularly with the pre-law adviser regarding law school interviews and examinations.

Schools of law have varying entrance requirements which the pre-law major will find stated in their catalogs. In general these recommend the choice of a bachelor of arts curriculum, with the objectives of developing facility in the use of English, familiarity with American history and philosophy, an understanding of elementary logic and mathematics, an appreciation of science in the modern world, and a fundamental knowledge of the social sciences. A major in economics relates effectively to corporation law, political science to administrative law and politics, accounting to tax law.

The University will accept a maximum of 39 quarter hours of study in an approved law school toward the completion of the pre-law curriculum in absentia, if the last 45 hours prior to these are taken at Youngstown State University. The student is cautioned, however, that few law schools now accept candidates without bachelor's degree.

PRE-MEDICAL STUDY AND ALLIED FIELDS

Requirements for Degree of Bachelor of Arts with a combined major in Pre-Medicine and Allied Fields*

Students intending to enter medically related professional schools may satisfy the requirements for the Bachelor of Arts degree by taking a combined major in biology, chemistry, physics, and mathematics. This major will consist of 70 hours distributed in the above four departments as specified by the admissions boards of the professional schools. General requirements of the College of Arts & Sciences must be fulfilled.** *See Biology Department for advisement for this major.*

*Pre-Veterinary, Pre-Dentistry, Pre-Osteopathy, and Pre-Chiropody.

PSYCHOLOGY

Professor S. N. Hotchkiss (chairman); Associate Professors Beckman, E. Painter, and Sweeney; Assistant Professors Cunningham, Dobrich, Guterba, S. M. Hotchkiss, Letchworth, and Wallace; Instructors Degli, H. Oles, Quinby, and Werbner.

The major in psychology is designed primarily for students who will be going on to do graduate work in the field, although it is also designed for those who want a terminal liberal arts degree. It consists of 45 quarter hours, including Psychology 601, 615, 713, and 714, each of which must be completed with a grade of C or better; and at least one course from each of the areas 1, 2, and 3 shown below. *No more than 2 courses from Area 4, below, may be counted toward the major:*

Area 1—Psychology 700, 705, 706, 803.

Area 2—Psychology 710, 722, 800, 828, 830.

Area 3—Psychology 702, 712, 802, 805, 810, 815.

Area 4—Psychology 703, 704, 707, 708, 709, 711, 732, 806, 832.

Biology 721 may be counted toward the major in psychology.

Psychology 601 is prerequisite to all other Psychology courses except Psychology 501 and 550.

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 evaluated as two hours for load and billing purposes. *Credits from this course cannot be used toward graduation.* 2 q.h.

Lower Division Courses

501. *Introduction to Psychology.* The basic principles of behavior. Motivation and learning; individual development; the role of conflict; the problems of human adjustment. *Not applicable toward a major in psychology.* 3 q.h.

601. *General Psychology.* The fundamental principles of human behavior. The relationship of physiological structure to behavior; the nature and development of perception, emotion,

**Some professional schools will have specific language requirements.

behavior, and other factors in the integration of personality. Prereq.: Sophomore standing or consent of chairman. 4 q.h.

615. *Introduction to Experimental Psychology.* The application of scientific methodology to psychology. Introduction to apparatus, problems and techniques, with experiments in selected areas. Prereq.: C or better in Psychology 601. 3 q.h.

Upper Division Courses

700. *Social Psychology.* The underlying psychological principles that give rise to the self, personality, and social-cultural reality; aspects of human conflict such as prejudice, revolution, and war; mass behavior; the crowd, fashion, public opinion, and propaganda; the psychology of social control and power. 3 q.h.

702. *Psychology of the Abnormal.* The causes, nature, and trend of mental maladjustments and injured personality, especially the major illnesses; the place of mental hygiene. Not open to students who have had Psychology 708. 3 q.h.

703. *Psychology of Religion.* Identical with Philosophy and Religion 706G. 3 q.h.

704. *Psychology of Music.* A study of important psychological investigations bearing upon musical composition, performance, and appreciation, as an aid to the understanding of individual differences in musical capabilities and to the application of such an understanding in teaching. Current psychological tests and measurements in music are also studied. 3 q.h.

705. *Child Psychology.* A genetic study of child development from the prenatal period to puberty, stressing the characteristic behavior and suitable training methods for each period of development. 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 four credit hours). 3 q.h.

706. *Psychology of Adolescence.* Characteristics and behavior problems of teen-age children. 3 q.h.

707. *Psychology of Marriage and Family Relations.* The social and psychological factors contributing to marital success and happiness in the modern family; processes of courtship, marriage, and parent-child interactions; sex relations, mental hygiene, homemaking with economic and religious correlations. Prereq.: Psychology 601 and junior standing. Listed also as Home Economics 707. 3 q.h.

708. *Psychology of Mental Health.* The principles and habits that insure a well-balanced personality and a sound mind. Not open to students who have had Psychology 702. 3 q.h.

709. *Psychology of Education.* The psychological principles in learning, teaching, and the growth of a successful personality. 3 q.h.

710. *Psychological Measurement.* The construction, administering, scoring, and interpreting of the objective examination; the selection, administering, scoring, and interpretation of results of standardized tests and scales, and their use in vocational and educational guidance. Prereq.: C or better in Psychology 601 and junior or senior standing. 3 q.h.

711. *Applied Psychology.* Survey of basic psychological principles applied to adjustment, mental health, business, industry, consumer education, political issues, crime, and practices in various professions. 3 q.h.

712. *Industrial Psychology.* An attempt to bring into a meaningful whole the major aspects of individual differences, improvement of work methods, training, fatigue, accident prevention, motivation, attitudes, morals, personnel counseling, labor relations and supervisions. 3 q.h.

713, 714. *Statistical Methods in Psychology.* An introductory course in frequency distributions, measures of central tendency, measures of variability, calculation and meaning of percentiles, the normal curves, reliability and validity of measures and simple correlation. Prereq.: C or better in Psychology 601 and two years of algebra. 3 + 3 q.h.

722. *Systematic Psychology.* A discussion of methodology, problems, and issues in psychology, including an introduction to the philosophy of science, especially as it relates to psychology. Prereq.: senior standing and consent of teacher. 3 q.h.

732. *Psychology of Exceptional Children.* The discovery, psychology, and treatment of children having inferior or superior intellectual ability, defects of vision, hearing, or speech, or neurological or orthopedic handicaps; delinquent children. Their emotional needs, and programs of educational treatment and training. Prereq.: Psychology 705. 3 q.h.

741, 742. *Psychology Seminar.* A discussion of major topics in psychology, e.g., learning theories, motivation, professional problems in psychology, and the current literature. For psychology majors only. Prereq.: junior standing. 1 + 1 q.h.

800. *Learning.* A study of the learning process, with emphasis on factors such as for-

getting, motivation, reinforcement, transfer, etc.: an introduction to modern learning theories. Prereq.: 601 + 9 additional q.h. of Psychology or consent of instructor. 3 q.h.

802. *Psychology of Personality.* An investigation of the variables which determine personality. Normal and abnormal patterns of behavior are discussed, and consideration is given to the more prominent theories of personality. 3 q.h.

803. *Comparative Psychology.* The evolution of behavior from single-celled organisms to man; the relationship between various stages of behavior and the evolving nervous systems. Prereq.: Psychology 601 and Biology 503. 3 q.h.

805. *Interviewing and Counseling.* The basic principles, purposes, and psychological problems of interviewing; special-purpose interviews and counseling; recording and evaluation of facts. Reporting and discussion of actual interviews; discussion of problems of class members. 3 q.h.

806. *Vocational Guidance.* Techniques of vocational guidance and their application to high school students, college students, vocational rehabilitation subjects and adults in general. 3 q.h.

810. *Introduction to Clinical Psychology.* A survey of diagnostic and treatment procedures and resources in clinical psychology including individual intelligence testing and projective personality techniques, consideration of professional problems in the field, and research design in the clinical area. Prereq.: Psychology 601, 702, and 802. 3 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 administration of intelligence testing. Prereq.: 710 and consent of instructor. 3 q.h.

821, 822. *Thesis.* A paper based on a systematic study of a problem or on a review of the literature relating to a problem in psychology. The paper's topic and the finished thesis are to be approved by the student's adviser and by another faculty member selected by the adviser. (This work may be an expansion or continuation of the work undertaken in Psychology 741 and 742). Two copies of the thesis are required for deposit in the University library. For psychology majors only. Prereq.: Thesis for psychology majors only; senior standing. 2 + 2 q.h.

828. *Physiological Psychology.* The structuro-functional relationships of the various divisions and sub-divisions of the neural system, their relationships to the organism as a whole, and their contributions to human behavior. Prereq.: Psychology 702 and Biology 503. 3 q.h.

830. *Contemporary Schools of Psychology.* A survey of psychological theories; their evolution, salient principles, and current status of acceptance. Prereq.: Psychology 702. 3 q.h.

832. *The Psycho-Social Dynamics of Religion.* Identical with Philosophy and Religion 832G. 3 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 including at least 24 hours in literature.

Lower Division Courses

501–502–503. *Elementary Russian.* 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. No credit can be given for this course if the student has been given entrance credit for two years of high school Russian. Five class meetings. 4–4–4 q.h.

601. *Intermediate Russian.* Continuation of inductive grammar. Emphasis on readings in prose and poetry. Oral and written practice based on readings. Five class meetings. Prereq.: C or better in Russian 503 or in second year high school Russian. 4 q.h.

602. *Intermediate Russian.* A continuation of Russian 601. Five class meetings. Prereq.: Russian 601 or equivalent. 4 q.h.

611, 612. *Scientific Russian.* A basic course designed to develop expeditiously an ability to read scientific literature in Russian. Five class meetings. Prereq.: C or better in Russian 503

or in second year high school Russian and one year of a laboratory science or equivalent. 4, 4 q.h.

Upper Division Courses

711, 712, 713. *Russian Culture and Civilization.* A survey of ideas expressed in Russian literary, philosophical, aesthetic, social, and political writings and their influence on the formation of Russian thought and culture. First quarter: From the beginnings to the 18th century. Second quarter: The Imperial Period to 1917. Third quarter: 1917 to the present. Prereq.: Russian 602, its equivalent, or permission of the instructor. 3, 3, 3 q.h.

762. *Advanced Russian Reading.* Reading and structural analysis of unsimplified selections from literature, journals, and newspapers. Prereq.: Russian 602 or equivalent. 3 q.h.

763. *Advanced Russian Conversation.* Intensive practice in common patterns of speech. Emphasis on construction, control, and use of idiomatic expressions. Prereq.: Russian 602 or equivalent. 3 q.h.

764. *Russian Composition.* Composition of themes in Russian on assigned subjects. Review of grammar. Prereq.: Russian 602 or equivalent. 3 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 consent of instructor. 3 q.h.

770. *Advanced Russian Grammar I.* Study of problems in Russian grammar. Exercises in analysis of common Russian expressions. Prereq.: Russian 602 or equivalent. 3 q.h.

771. *Advanced Russian Grammar II.* Analysis of the structure of original texts from Russian classics and journals. Study of the different types of compound and complex sentences. Prereq.: Russian 602 or equivalent. 3 q.h.

772. *Russian Stylistics.* Prereq.: Russian 602 or equivalent. 3 q.h.

804. *Russian Literature from 1100 to 1800.* Reading and interpretation of Russian literature from its beginnings to Pushkin. Prereq.: Russian 711 or permission of the instructor. 3 q.h.

805. *Russian Literature from 1800 to 1865.* Reading and interpretation of works by Pushkin, Lermontov, Gogol, Turgenev and others. Prereq.: Russian 712 or permission of the instructor. 3 q.h.

806. *Russian Literature from 1865 to 1917.* Reading and interpretation of works by Dostoevsky, Tolstoy, Goncharov, Chekov, Gorky, and others. Prereq.: Russian 712 or permission of the instructor. 3 q.h.

807. *Russian Literature Since 1917.* Reading and interpretation of works by Leonov, Blok, Fedin, Sholokhov, Pasternak, and others. Prereq.: Russian 713 or permission of the instructor. 3 q.h.

870, 871, 872. *Special Reading and Research.* Directed study on a central theme or thesis in Russian language or literature terminating in an examination, research paper, or both. Prereq.: Permission of the department head and voluntary agreement of the instructor. 1–5, 1–5, 1–5 q.h.

873, 874, 875. *Seminar in Russian Language or Literature.* A seminar in problems in Russion language or literature. Prereq.: Senior standing and permission of the instructor. 3, 3, 3 q.h.

876. *Study Abroad.* See the department chairman for details. Prereq.: Prior permission from the department chairman and major advisor. 1–15 q.h.

SOCIOLOGY

Professor Botty; Associate Professors Kiriazis (chairman), Dobbert, Ducey, and V. Smith; Assistant Professors Boland, DeGarmo, Foster, McDonald, and Poddar; Instructor Moore.

The Department of Sociology offers a major in either general sociology or a combination from sociology, anthropology and social services. With the department of Police Science it offers both an Associate and a Baccalaureate program as outlined elsewhere. It also offers minors in the fields of sociology, anthropology or social services. It provides academic advisement to professional nurses.

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 service in public administration, social security and its allied programs, recreation and health services.

The departmental courses are classified below. All majors must take the asterisked courses.

GENERAL SOCIOLOGY: 600*, 601, 700, 701*, 702*, 703, 705, 706, 707, 708, 709, 735, 736, 737, 738, 751*, 759*, 760*, 787, 800, 899.

ANTHROPOLOGY: 612, 712, 713, 714, 715, 716, 717, 718, 719, plus 600, 701, 702, 751, 760, 800, 899.

SOCIAL SERVICES: 720, 721, 722, 723, 724, plus 600, 601, 701, 751, 760, 800, 899.

Selected courses from other departments may be added by permission of the departmental chairman.

Lower Division Courses

600. *Principles of Sociology.* Underlying principles of the science of society, with reference to types of societies, groups, and classes; development of culture and personality; laws of population; structure and organization of social institutions; dynamics of social change. Prereq.: Social Science 501, 502, 503. 5 q.h.

601. *Social Pathology.* The causes and present status of selected social and personal maladjustments with possible remedies. Prereq.: Social Science 501, 502, 503. 3 q.h.

612. *Cultural Anthropology.* An approach to the science of culture; its primitive origins. Prereq.: Social Science 501, 502, 503. 5 q.h.

634. *Criminal Justice.* Identical with Police Science 605. 3 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 signficance of membership in such a group for in-group, out-group, and community solidarity. Special emphasis on the American Negro. Prereq.: Sociology 600. 3 q.h.

701. *Social Statistics I.* Measurement and interpretation of social data by the use of descriptive techniques. Prereq.: Sociology 600. 3 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.: Sociology 701. 3 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.: Sociology 600. 3 q.h.

705. *The Family.* Family and kinship systems as a major social institution; their development, functions and relation to other basic institutions as found in different cultures and social strata. Prereq.: Sociology 600. 4 q.h.

706. *Industrial Sociology.* Industrial social organization in our urbanized culture; small and large enterprises related to each other, to our social class system, to minority groups and to our major social institutions; the repercussions of social change and technological progress. Prereq.: Social Science 501, 502, 503 or junior standing. 3 q.h.

707. *Urban Sociology.* The city in modern industrial civilization; its physical plant and land-use pattern; its changing social structure within the total social milieu; the sociological aspects of urban planning. Prereq.: Sociology 600. 3 q.h.

708. *Political Sociology.* The social conditions that affect government and politics determine political order and regulate struggles for power; associations, political parties, and movements to stabilize or to change the political order. Special consideration is given to nineteenth and twentieth century movements. Prereq.: History 601, 602, 603. 3 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.: Sociology 600. 3 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.: Sociology 612. 4 q.h.

713. *Social Anthropology.* The origin, diffusion and continuity of primitive social institutions with their relation to contemporary social phenomena. Prereq.: Sociology 612. 3 q.h.

714. *Physical Anthropology I.* The physical origins of man and the biological bases of his social behavior. Prereq.: General Biology and Sociology 612. 3 q.h.

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

716. *Anthropology: Maya, Aztec and Inca Cultures.* The origins, culture and achievements of the classical civilizations of the New World: Aztec, Inca and Maya. Prereq.: Sociology 612. 3 q.h.

717. *Anthropology: American Indian Cultures.* The origins, culture and achievements

of North and South American Indians. Prereq.: Sociology 612. 3 q.h.

718. *Anthropology: African and Middle Eastern Cultures.* An analysis of ancient and contemporary primitive cultures found in Africa and the Middle East. Prereq.: Sociology 612. 3 q.h.

719. *Anthropology: Asian, Australian and Oceanian Cultures.* An analysis of ancient and contemporary primitive cultures found in Asia, Australia and Oceania. Prereq.: Sociology 612. 3 q.h.

720. *Historical Introduction to Social Services I.* A historical survey of the origins and nature of social services in western civilization, with emphasis on the United States. Prereq.: Sociology 600. 3 q.h.

721. *Historical Introduction to Social Services II.* A survey of the programs, organization, functions and interrelationships of the various public and private social services in the United States. Visits to local agencies. Prereq.: Sociology 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.: Sociology 705 and 721. 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.: Sociology 721. 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.: Sociology 721. 3 q.h.

735. *Juvenile Delinquency.* Social and psychological factors underlying delinquency, the juvenile court and probation; treatment and preventive measures. Prereq.: Sociology 600. 3 q.h.

736. *Criminology I.* The psychological and social factors underlying crime, criminal behavior and prevention. Prereq.: Sociology 600. 3 q.h.

737. *Criminology II.* The legal administration of criminal justice, from apprehension to acquittal or conviction. Prereq.: Sociology 736. 3 q.h.

751. *Social Research.* Seminar in methods of obtaining, interpreting, and presenting sociological data. Each student makes an intensive study of an existing situation. Prereq.: Sociology 702. 3 q.h.

759. *History of Social Philosophy.* The evolution of social theory up to Comte. Prereq.: Sociology 600. 3 q.h.

760. *History of Social Theory.* The development of social theory since Comte, with emphasis on various present-day schools of thought. Prereq.: Sociology 759. 3 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 Economics 787 and History 787. Prereq.: junior standing. 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 entire life process. Prereq.: Sociology 612 and 705. 4 q.h.

899. *Senior Readings.* Examination of current trends in the profession, both substantive and methodological. Intended for students planning to enter graduate school. Offered only in fall quarter. Prereq.: Departmental major in senior year. 1 q.h.

SPANISH

A major in Spanish consists of 45 quarter hours above the elementary level, including Spanish 701, 702, 703. For a combined major in humanities, see *Humanities.*

Lower Division Courses

501–502–503. *Elementary Spanish.* 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. No credit can be given for this course if the student has been given entrance credit for two years of high school Spanish. Five class meetings. 4 + 4 + 4 q.h.

601. *Intermediate Spanish.* Review of grammar through oral and written exercises. Reading of modern prose and poetry. Five class meetings. Prereq.: C or better in Spanish 503 or in second year high school Spanish. 4 q.h.

602. *Intermediate Spanish.* A continuation of 601. Five class meetings. Prereq.: Spanish 601 or equivalent. 4 q.h.

Upper Division Courses

All upper division courses (except 865, 866) are conducted in Spanish.

701, 702, 703. *Survey of Spanish Literature.* An introduction to the study of Spanish Literature, aimed at acquainting the student with the main works, writers and principal literary tendencies and movements. First quarter: from the beginnings to 1700. Second quarter: from 1700 to 1900. Third quarter: from 1900 to the present. 3 + 3 + 3 q.h.

711, 712, 713. *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. First quarter: from the beginning to 1888. Second quarter: Modernismo. Third quarter: from 1910 to the present. 3 + 3 + 3 q.h.

721, 722. *Advanced Spanish Composition and Grammar.* A review in depth of Spanish grammar through analysis of stylistic devices of literary works and through exercises, translation, and original composition. Prereq.: C or better in Spanish 602. 3 q.h.

723. *Explicacion de Textos.* Detailed examination of poetry and prose to develop skill in perceptive analysis of literature. Prereq.: Spanish 722. 3 q.h.

731, 732, 733. *Spanish Conversation.* A course in oral Spanish, with the teacher using the direct conversational approach to help the student speak the language fluently. First quarter; topics leading to the use of Spanish in practical everyday situations. Second quarter: topics leading to acquaint the student with the Spanish culture and civilization as expressed in everyday life. Third quarter: topics leading to acquaint the student with the Spanish American republics, their way of life, social and political institutions. 3 + 3 + 3 q.h.

801, 802, 803. *Classical Spanish Literature.* The literature of the Golden Age. First quarter: the drama. Second quarter: the prose. Third quarter: the poetry. Prereq.: Spanish 701, 702, 703. 3 + 3 + 3 q.h.

811, 812, 813. *Nineteenth Century Spanish Literature.* The literature of the nineteenth century starting with the end of neo-classicism, romanticism, realism and naturalism. First quarter: the drama. Second quarter: the prose with special emphasis on the renaissance of the novel. Third quarter: the poetry. Prereq.: 701, 702, 703. 3 + 3 + 3 q.h.

821, 822, 823. *Twentieth Century Spanish Literature.* The literature of the twentieth century, including the Generation of 1898, modernismo, postmodernismo and the contemporary writers. First quarter: the drama. Second quarter: the prose. Third quarter: the poetry. Prereq.: 701, 702, 703. 3 + 3 + 3 q.h.

831, 832, 833. *Modern Spanish American Literature.* The literature of the Spanish American countries from the middle of the nineteenth century to the present. First quarter: the essay, the short story and the drama. Second quarter: the novel. Third quarter: the poetry. Prereq.: Spanish 711, 712, 713. 3 + 3 + 3 q.h.

841, 842. *Medieval Spanish Literature.* The literature of the 12th, 13th, 14th, and 15th centuries including the *jarchas* through Jorge Manrique; the prose from Alfonso el Sabio through *La Celestina.* Prereq.: Spanish 701 or equivalent. 3, 3 q.h.

843. *Pre-Lope de Vega Drama.* The evolution of the drama from *El Auto de los Reyes Magos* through Juan del Encina. Prereq.: Spanish 701 or equivalent. 3 q.h.

864. *History of the Spanish Language.* The development of the Spanish language from Latin to Old Spanish to Modern Spanish with an intensive study of the development of the 2000 basic words in Modern Spanish: sounds, inflections, syntax, word meaning and usage. Prereq.: senior standing or permission of the instructor. 3 q.h.

865, 866. *Comparative Romance Linquistics.* First course: the phonology and vocabulary of the chief Romance dialects. Second course: morphology and syntax. 3 + 3 q.h.

870, 871, 872. *Special Reading and Research.* Directed study on a central theme or thesis in Spanish language or literature terminating in an examination, research paper, or both. Prereq.: Permission of the department head and the voluntary agreement of the instructor. 1–5, 1–5, 1–5 q.h.

873, 874, 875. *Seminar in Spanish Language or Literature.* A seminar in problems in Spanish language and literature. Prereq.: senior standing or permission of the instructor. 3, 3, 3 q.h.

876. *Study Abroad.* See the department chairman for details. Prereq.: Prior permission from the department chairman and major advisor. 1–15 q.h.

SPEECH AND DRAMATICS

Associate Professors Elser (chairman), H. Crites, and Haller; Assistant Professor O'Neill; Instructor Grcevich.

Speech majors 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 prerequisite to all other courses in Speech are Public Speaking 613, Communication 506, or preparation satisfactory to the teacher or department chairman.

Lower Division Courses

515. *Fundamentals of Speech.* Study and practice of basic techniques for effective speech. (For transfer students only with one year previously in Composition.) 3 q.h.

611. *Introduction to Theatre Arts.* Study of the theory, the history, the cultural role, and the physical characteristics of the theatre as an institution in human society. 4 q.h.

613. *Public Speaking.* The effective construction and delivery of speeches. Frequent presentation of short talks before the class. 3 q.h.

614. *Business and Professional Speech.* A study of the principles of conference speaking in business, educational, industrial, and professional situations. Primarily for students enrolled in Business Administration. 3 q.h.

615–616. *Oral Interpretation.* An introduction to the basic philosophy and methods of the oral interpretation of literature (prose, poetry, and drama) with emphasis on performance in class. Prereq.: Speech 613 or 614. 3 + 3 q.h.

617. *Principles and Practices of Broadcasting.* A survey course designed to familiarize students with the principles and practices involved in radio and television broadcasting. Prereq.: Speech 613 or 614. 3 q.h.

618, 619, 620. *Play Production* (Lecture and Laboratory). Instruction in the production of plays in class and before the public. First course: Introduction problems. Second course: Costuming, makeup, and technical work coincident with the productions of the University Theatre. Third course: Scene design, stage lighting, costume design. Prereq.: Speech 613 or 614. 3 + 3 + 3 q.h.

621. *Voice and Diction.* A fundamental study of the voice mechanism; breath control, enunciation, articulation, vocal variety. Prereq.: 615. 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.

Upper Division Courses

713. *Radio and Television Announcing.* A study of the announcer's role in radio and television stations. Basic principles and practices of announcing, continuity writing, and broadcast operation. Class and laboratory. Prereq.: 617 or consent of instructor. 3 q.h.

715. *Parliamentary Procedure.* A study of the proper procedures in the conduct of business meetings, the formation of organizations, the writing of constitutions. Prereq.: Speech 613 or 614 or consent of instructor. 2 q.h.

716, 717, 718. *Acting.* Rehearsal and classroom performance. Course One: Elementary techniques of stage action and practice in the reading and acting of dramatic literature. Course II: Advanced work in character analysis and development. Course III: Creation of roles in plays of different types, styles and periods. 3 + 3 + 3 q.h.

719, 720, 721. *Play Production.* (Lecture and Laboratory). A more direct participation in the theatre production of the department than is attempted in 618, 619, 620. This can include assignment as assistant director, stage manager, house manager, scene designer, etc. Prereq.: Consent of instructor or department head. 3 + 3 + 3 q.h.

722. *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.: Play Production 618, 619, 620 or consent of instructor. 3 q.h.

723. *Elementary Set Design for Stage and Television.* The fundamentals of set design for the stage and television. From working drawing to set construction. Prereq.: Play Production 719 or consent of instructor. 3 q.h.

727. *Creative Dramatics.* Principles and practices in the conduct of informal drama with children and adults. Improvised play making with emphasis on the creative development of the participants. Prereq.: Communication 508 or consent of instructor. 3 q.h.

728. *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. Elective for secondary teachers. 3 q.h.

754. *Phonology.* Identical with Phonology 754. Prereq.: Communication 508 or its equivalent. 4 q.h.

811–812. *Debate and Discussion.* The first term will investigate principles and practices of formal argumentation including analysis of issues, evidence, reasoning, and refutation. The second term will be devoted to principles and practices of small group discussion. The course will teach techniques of effecting group interaction as well as review significant behavioral research in this area. Prereq.: 613. 3 + 3 q.h.

813. *Classical Rhetoric.* A study principally of the teaching of Aristotle, Cicero, and Quintilian, with chief focus on the three principal divisions—discovery of arguments, arrangement of materials, and style. Prereq.: Consent of instructor or department head. 4 q.h.

814. *Medieval and Renaissance Rhetoric.* A study of the teaching of St. Augustine, through Ramus, and of the English Vernacular Rhetorics, Cox through Whately. Prereq.: Consent of instructor or department head. 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.

816. *American Rhetoric.* Theory and Practice: Colonial times to the present, including the history of the study of Rhetoric in American education. Prereq.: Consent of instructor or department head. 4 q.h.

817. *British and American Oratory.* A study of important speakers and speeches in relation to times of cultural crisis. Prereq.: Consent of instructor or department head. 4 q.h.

818. *Contemporary Public Address.* A study of contemporary speakers and their effectiveness. The course will also focus on twentieth century trends in communication theory, including the growth of experimental research, semantics, and linguistics. Prereq.: Consent of instructor or department head. 4 q.h.

821, 822, 823. *Theatre Directing.* (Lecture and laboratory). Course I: Introduction to the problems of directing. Course II: Continuation with the student directing or assisting in directing a one-act play either in class or for public performance. Course III: Problems involved in directing the longer play. Special emphasis will be given to the production of the high school play. Prereq.: Consent of department chairman or teacher. 3 + 3 + 3 q.h.

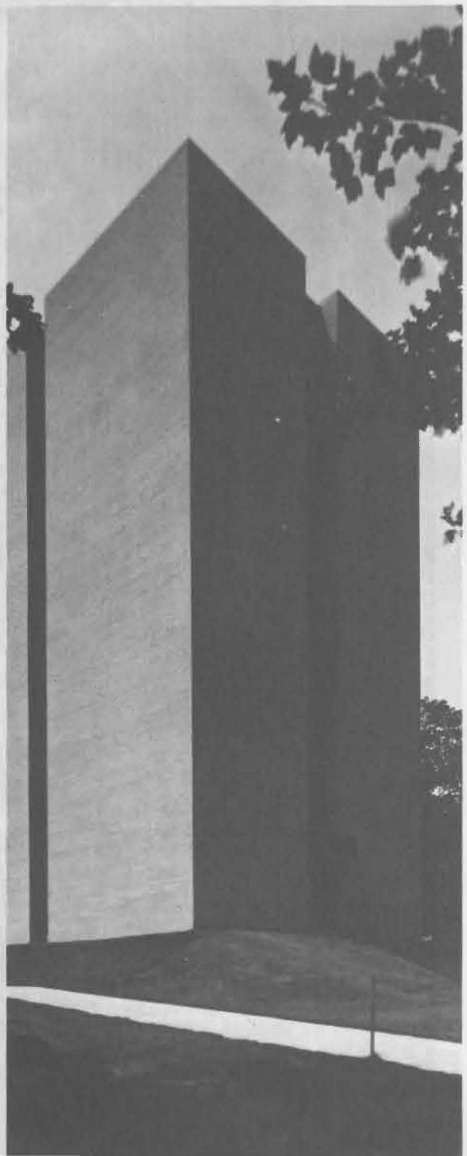
UNIVERSITY HONORS SEMINAR

Professors Roberts (supervisor), P. Botty, and T. Miner; Associate Professor Slavin.

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 *Biology.*

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YOUNGSTOWN COLLEGE
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The School of Business Administration

Robert LaVelle Miller, Dean

ORGANIZATION AND DEGREES

The School of Business Administration has four departments: Accounting, Advertising and Public Relations, Business Organization and Merchandising.

Majors are offered in accounting, advertising and public relations, commercial art, financial management, general administration, industrial management, industrial or retail merchandising, public administration, transportation management and secretarial studies. Minors are offered in accounting, advertising, business organization (except when the majors are financial management, general administration, industrial management, public administration or transportation management), finance, management, merchandising, and transportation.

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 section. A two-year curriculum leading to the Associate in Applied Business Degree through the Technical and Community College is also offered in all 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 curriculum leading to the degree require a minimum of 189 quarter hours of credit (197 for commercial art, general administration or transportation management; 199 for secretarial studies; 205 for accounting, financial management or public administration), and are designed to be completed in four academic years. A student willing and able to carry heavier loads successfully may finish in less time.*

R.O.T.C. students are allowed certain modifications of the 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	1–2
Geometry	0–1
Science or additional mathematics	1
Others	10–8
	16

IN THE UNIVERSITY

COURSE REQUIREMENTS (OTHER THAN THE MAJOR AND MINOR)

UNIVERSITY CORE COURSES

	QUARTER HOURS OF CREDIT
Communication 505–506–507–508 Basic Courses I–II–III–IV	12
English: any 600-level literature courses	6
Health and Physical Education 509C Health Education	3
Health and Physical Education activity courses	6
History 601, 602, 603 The United States I, II, III or History 651, 652, 653 Western Civilization I, II, III	9
Philosophy and Religious Studies elective or Humanities elective	4
Psychology 601 General Psychology	4
Social Studies electives	9
Science Electives	9
Mathematics 531 Mathematics of Business or Mathematics 542 Special Topics of Algebra, where applicable to a specific curriculum	5
	67

SCHOOL OF BUSINESS ADMINISTRATION CORE COURSES

	QUARTER HOURS OF CREDIT
Accounting 601, 602, 603 Elementary Accounting I, II, III	9
Business Organization 701 Law I	3
Business Organization 712 Business Letters	3
Business Organization 720 Business Finance	4
Business Organization 725 Fundamentals of Management	5
Business Organization 750 Human Behavior in Organization	4
Economics 601, 602, 603 Principles of Economics I, II, III	9
Economics 704 Statistics I	3
Merchandising 624 Marketing	5
	45

REQUIREMENTS IN ADDITION TO COURSES

	QUARTER HOURS OF CREDIT
Completion of the number of quarter hours required for degree	189 to 205

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.

school of business administration

REQUIREMENTS FOR THE MAJOR AND MINOR

The courses required for the majors in accounting, advertising and public relations, financial management, industrial management, industrial or retail merchandising, and transportation management are stated in the announcements of the accounting, advertising and public relations, business organization, and merchandising departments. The combined major in commercial 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 business organization 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 and by the Dean of the School of Business Administration. 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 behavorial 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 approval of the department chairman.

Curriculums for the several major fields open to business administration students will be found after the course descriptions for merchandising.

ACCOUNTING

Professor Reilly; Associate Professors Chuey, Evans, and Jenkins; Assistant Professors Magner (acting chairman), Fortunato, Goldstein, Petrych, and Schneider; Instructors Ferro, and Zetts.

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 a minor in accounting. The curriculum for a major in accounting consists of 44 quarter hours and includes Accounting 701–702, 710, 713, 714, 801, 807, 813, 814, and a minimum of six quarter hours in Accounting electives. A student majoring in accounting must have a minor of at least 21 quarter hours in a related field or in a field approved by the Chairman of the Accounting Department and the Dean of the School of Business Administration.

A minor in accounting consists of 22–24 quarter hours and includes Accounting 601, 602, 603, 701–702 plus 3–5 additional hours in consultation with an adviser.

A grade of C or better in Accounting 603 is prerequisite to all more advanced courses in accounting. Approval of the Chairman of the Accounting Department is required to carry three or more accounting courses the following quarter.

Lower Division Courses

601, 602, 603. *Elementary Accounting I, II, III.* Fundamentals of record keeping and the development of the complete accounting cycle with emphasis upon working papers and classified financial statements for service, merchandising, and manufacturing operations. A practice set and problems supplement the theory, principles, and management applications. 3 + 3 + 3 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 603. 5 + 5 q.h.

709. *Managerial Accounting.* An approach to the use of accounting information for managerial control and planning in business. Areas covered in the course include the elementary principles of cost accounting, analysis of financial data, price-level concepts, cash-flow and working capital concepts, consolidations, and budgeting. Prereq.: C or better in Accounting 603. 3 q.h.

710. *Basic Concepts of Data Processing.* Through the consideration of the logical components of data processing, the complete concept of data processing is developed from the unit record card and punched-card machines through computer systems. Flow-charting, the universally accepted language of business (COBOL), and business applications are included. Prereq.: junior standing, if non-accounting major. 3 q.h.

713. *Basic Cost Accounting.* The principles of cost-finding for manufacturing accounts, including the three-fold division of costing: material accounting, payroll records, and the recording and applying of manufacturing expense. Job order and process costs are covered, with emphasis on budgeting as a means of overhead control. Prereq.: C or better in Accounting 603. 4 q.h.

714. *Advanced Cost Accounting.* This course covers estimating, standard, distribution, differential, and by-product costing with emphasis on the use of cost data as a means of managerial control. Prereq.: C or better in Accounting 713. 4 q.h.

800. *Computer Concepts.* An approach to business procedures and systems through the use of electronic computers. Basic techniques of computer programming; adaptation of data processing fundamentals to business problems; and, a case study of an electronic computer installation. Prereq.: Accounting 710 or consent of the teacher. 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 702 or 709, or consent of the teacher. 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, gifts 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.

816. *Budgetary Control.* Compilation and preparation of budget data, for managerial and administrative purposes. Various types of budgets are prepared and selected problems of budgeting worked. Prereq.: C or better in Accounting 714 and 801. 3 q.h.

818. *Controllership.* A seminar approach to controllership applications. Case studies are presented in which the student becomes a member of a committee: which either defines the problem existing in an actual case; originates alternative courses of action for the problem; or, evaluates the best solution to the problem. In addition, each student is assigned an individual term paper to do original research on throughout the quarter for a practical application of controllership. Prereq.: C or better in Accounting 714 and 801. 3 q.h.

820. *Funds Accounting* The principles and standards, terminology, and classification of accounts for governmental and non-profit organizations. General and specific funds' applications as to budgets, revenues and expenditures, fixed assets, bonded debt and interest, and interfund relationships and transfers. Auditing and financial reporting of funds. Prereq.: Accounting 702 or 709. 4 q.h.

831. *C. P. A. Review I.* All types of accounting theory, law and auditing problems are solved and discussed from the standpoint of both theory and practice, with special emphasis on accuracy and clarity in such problems as are encountered in C. P. A. examinations. Students take two full-day examinations during the quarter under conditions similar to those encountered when taking the C. P. A. examination. Prereq.: C or better in Accounting 807 or consent of the department chairman. 3 q.h.

832. *C. P. A. Review II.* All types of accounting practice problems are solved and discussed from the standpoints of both theory and practice with special emphasis on accuracy and clarity in such problems as are encountered in C. P. A. examinations. Students take two full-day examinations during the quarter under conditions similar to those encountered when taking the C. P. A. examination. Prereq.: C or better in Accounting 801 or consent of the department chairman. 3 q.h.

851. *Business Readings and Applications.* Individual Readings and Research in Accounting Problems. The student chooses special topics beyond the required readings and prepares papers on these topics for the benefit of the group. Prereq.: C or better in Accounting 801 or consent of the department chairman. 3 q.h.

ADVERTISING AND PUBLIC RELATIONS

Associate Professor Flad (chairman); Assistant Professors Braden, Einstein, Koornick, and Mamula; Instructors Sekeres and Zeno.

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 media; or positions in the area of advertising and public relations in commercial firms, any of the non-profit public service organizations or governmental agencies.

A major in advertising and public relations consists of 45 quarter hours: it includes 30 quarter hours in the advertising sequence and 15 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 commercial art is also offered and consists of 71 quarter hours: it includes 21 quarter hours in the advertising and public relations sequence; 36 quarter hours in art; and 14 quarter hours in merchandising as outlined in the curriculum printed in the Curriculums section.

A student majoring in advertising and public relations or commercial 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 and the Dean of the School of Business Administration.

A minor in Advertising consists of 21 quarter hours and includes Advertising 627, 628, 629 and 729, plus 9 additional hours in consultation with an adviser.

Advertising Sequence

Lower Division Courses

627. *Advertising Principles I.* A survey of advertising as an instrument of modern business and selling, including the various forms of advertising. This course includes the economics, methods, and psychology of advertising, with an introduction to marketing research,

consumer analysis, market analysis, and sales potentials. Prereq.: sophomore standing. 3 q.h.

628. *Advertising Principles II.* This course deals with such problems as careful media selection, the use of newspapers, magazines, radio, television, and direct mail. Other media covered include point-of-purchase, outdoor posters, transportation advertising, trade shows and expositions. The course also includes discussion of popular consumer appeals and some phases of copywriting. Prereq.: Advertising and Public Relations 627. 3 q.h.

629. *Advertising Procedures.* Visual elements of the advertisement, which include layout, balance, and composition. Mechanics of reproduction: printing, typography, plates, and engraving. The course also comprises a study of advertising agencies, company advertising departments, advertising campaigns, and budgeting. Prereq.: Advertising and Public Relations 628. 3 q.h.

Upper Division Courses

729. *Advertising Copywriting.* Practical and creative applications of basic advertising objectives. Definition and discussion of the various elements of copywriting. The course also includes the writing of headlines, body copy, and finally, the creating of complete consumer advertisements. Other creative factors studied are slogans, trade-marks, and brand names. Prereq.: Advertising and Public Relations 629. 3 q.h.

730. *Advertising Copy-Layout I.* This course comprises the creation and writing of mail-order copy, direct mail, advertising for business and trade publications, outdoor posters, radio, and television copy. The legal problems of copy-writing are explored. Some introductory phases of layout work are introduced dealing with theory and practice. Prereq.: Advertising and Public Relations 729. 3 q.h.

731. *Advertising Copy-Layout II.* Emphasis is on the actual making of layouts: complete layouts that have good attention value, attractive style, clarity, and definite sales appeals. Layouts are designed for magazine and newspaper advertisements, direct mail, posters, magazine covers, outdoor posters, and packages. The graphic arts in television are also included. Prereq.: Advertising and Public Relations 730. 3 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 and Public Relations 729 and 730. 3 q.h.

814. *Advertising Case Studies.* A study of actual case histories taken from leading business firms. Analyses of these cases and their promotional backgrounds provide an understanding of the practical application of advertising to specific business situations. The student is in the position of the business executive who must make decisions on various advertising problems. Prereq.: Advertising and Public Relations 729. 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 programs, the writing and production of various kinds of commercials, and merchandising the campaign to the trade and to the consumer. Prereq.: Advertising 729. 3 q.h.

821. *Advertising Problems and Campaigns I.* Application of fundamental theories and practices to a specific advertising problem, including the development and creation of a complete consumer 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 731. 3 q.h.

822. *Advertising Problems and Campaigns II.* This course comprises the various space and time-buying functions, budgeting, scheduling, media planning and media selection. The student learns how to figure advertising costs and must make definite decisions about expenditures for the proper advertising-selling-media mix. Prereq.: Advertising and Public Relations 821. 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.

753. *Introduction to Journalism.* A survey course introducing students to journalism history, press law, ethics, libel, newspaper organization, and theory of communications. Emphasis is on practicel writing exercises based on a known set of facts. Prereq.: junior standing. 3 q.h.

755. *News Reporting and Writing.* The development of the reporter with emphasis on beat and spot news reporting for newspapers and house organs. Consideration of material related to newspaper offices, sources of news,

writing styles, and modern public relations techniques. Prereq.: Advertising and Public Relations 753. 3 q.h.

757. *Editing and Make-up.* Stresses the editor's and editorial activities. Emphasis on active preparation of newspaper and house organ stories, evaluation of news, newsgathering methods, plus principles of copyreading, editing, make-up, headlines, typography, illustrations, and page-layout. Prereq.: Advertising and Public Relations 753. 3 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.: Advertising and Public Relations 710 and Business Organization 712. 3 q.h.

BUSINESS EDUCATION

For the major in Business Education, see the School of Education section.

BUSINESS ORGANIZATION

Associate Professor Teodorescu (chairman); Assistant Professors Boland, Dastoli, Fortunato, Grim, Gutknecht, Lacich, Long, Meiners, Painter, Provance, Schneider, Walsh and Wolanin; Instructor Moore.

The Department of Business Organization 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 financial management, 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; (d) provide for the minor in business organization; and (e) by the selection of specified courses in business organization provide for a minor in finance, management or transportation.

The majors in business organization and their requirements in business organization courses are: financial management, a total of 50 quarter hours; industrial management, a total of 50 quarter hours; and transportation management, a total of 50 quarter hours. The combined major in general administration consists of a total of 74 quarter hours in accounting, business organization and merchandising. The combined major in public administration consists of a total of 72 quarter hours in accounting, business organization, political science, and sociology. See the curriculums for each of these majors which are printed in the Curriculums section.

A student majoring in financial management, 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 Business Organization Department and the Dean of the School of Business Administration.

A minor in Business Organization consists of 21 quarter hours and includes Business Organization 720, 725 and 750 plus 8 additional hours in consultation with an adviser.

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.

NOTE: For students whose curriculums previously required Business Organization 542, 641 and 642 for a total of eleven quarter hours, the new requirements of Mathematics 542 and 550 is a reduction of one quarter hour. Consequently, the one hour will be added to the elective hours specified in the curriculums affected by the change in the mathematics requirements.

Upper Division Courses

701. *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, and carriers are analyzed. Prereq.: junior standing. 3 q.h.

702. *Law II.* The provisions of the Uniform Commercial Code are studied with reference to the sales contract, transfer title, warranties, duties, liabilities, rights and remedies of the parties. This course also considers commercial paper, requisites and meaning of negotiability, rights and liabilities, defenses and discharge under the Uniform Commercial

Code. Bank deposits, personal property and public rights in private property are covered. Prereq.: Business Organization 701. 3 q.h.

703. *Law III.* 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.: Business Organization 702. 3 q.h.

705. *Principles of Transportation.* The historical, economic, and regulatory background of transportation is studied. Emphasis is placed on the economic basis of rates and market centers. The valuation of property assets and their rate of return is given consideration. Prereq.: Economics 603. 5 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. 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.: Business Organization 712. 3 q.h.

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.: Business Organization 701. 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.: Business Organization 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.: junior standing. 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.: Business Organization 701. 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.: Business Organization 701. 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 603 and Business Organization 702. 3 q.h.

725. *Fundamentals of Management.* This course emphasizes the basic principles of management rather than those involving business organization. It studies the nature of managerial action within an organization, formal and informal structure, process of making decisions and interrelated activities in management. Prereq.: junior standing. 5 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 the security market. Practices, procedures, and regulations relating to the listing of securities and to the buying and selling of securities are covered. Prereq.: Business Organization 730 or consent of the teacher. 3 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.: Business Organization 725. 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.: Business Organization 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.: Business Organization 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.: Business Organization 705 and 746. 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.: Business Organization 725 and Economics 705. 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.: Business Organization 819. 4 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. 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.: Business Organization 720. 5 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.: Business Organization 725 and 750 and senior standing. 3 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.: Business Organization 750 and 819. 3 q.h.

855. *Business Ethics.* Analysis of major policies involved in the management of a business and its relation to society, stockholders, customers, employees, competitors and the government. Prereq.: Business Organization 725 and 750 or consent of the teacher. 2 q.h.

COMMERCIAL ART

For the combined major in Commercial Art, see Advertising and Public Relations.

FINANCIAL MANAGEMENT

For the major in Financial Management, see Business Organization.

GENERAL ADMINISTRATION

For the combined major in General Administration, see Business Organization.

INDUSTRIAL MANAGEMENT

For the major in Industrial Management, see Business Organization.

MERCHANDISING

Assistant Professors Deiderick (acting chairman), Braden, Burkholder, Hanks, Liber, Mathews, and Seifert; Instructor Davis.

Merchandising 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 merchandising may be in either industrial merchandising or retail merchandising. A major in industrial merchandising consists of 46 quarter hours and a major in retail merchandising consists of 46 quarter hours. They include Merchandising 624, 625, 731 or 733, 813 and other courses included in the curriculums printed in the Curriculums section. A student majoring in industrial merchandising or in retail merchandising must have a minor of at least 21 quarter hours in a related field or in a field approved by the Chairman of the Merchandising Department and by the Dean of the School of Business Administration.

A minor in Merchandising consists of 23 quarter hours and includes Merchandising 624 and 625 and 15 additional hours in consultation with an adviser.

Lower Division Courses

530. *Introduction to Merchandising Techniques.* This course is designed to provide complete and detailed explanation of the many merchandising problems. The primary objective of the course is to help the student understand and apply merchandising techniques to practical situations. (This course is required in the Merchandising Technology Curriculum only for the Technical and Community College). 5 q.h.

624. *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 a 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.: Merchandising 624. 3 q.h.

711. *Management of Retail Buying.* Study of principles and philosophy that determines excellence in merchandise selection. Management of buying functions, breadth of assortment, depth of stock and development of buying cycles. Gives ethical and legal considerations in buying. Suggests what to buy through consumer behavior, customer wants, and sales experiences. Prereq.: Merchandising 624. 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.: Merchandising 624. 3 q.h.

726. *Dynamic Thinking.* Application of the principles of positive imaging to the desires of the individual are presented. Every person has the power to magnify himself; to multiply the ways in which he exists; to make his life full, confident, significant, interesting and successful. Personal success in being creative is the basis for good selling. Prereq.: junior standing. 3 q.h.

731. *Non-Textiles.* Apparel accessories. Designed to meet the needs of buyers, copywriters, training departments, comparison shoppers, and instructors in consumer or distributive education fields. Sources of raw materials, manufacturing processes, care, use and selling points of the following types of merchandise are studied: leather products, furs, jewelry, metals, stones, and cosmetics. 3 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. Designed

for buyers, purchasing agents, sales people and teachers. 3 q.h.

735. *Visual Merchandise Presentation.* Principles of interior, window, and industrial display. Planning, selecting, and preparing merchandising arrangements. Discussion of display department's organization, functions, and management: merchandising promotion through display; signs and pricing; and display illumination. Prereq.: junior standing. 3 q.h.

737, 738. *Textile Fabrics I, II.* 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 the fibers. Government rulings are studied. Uses and wearability of materials are investigated. Swatches of materials are used as illustrations. Merchandising 737 is a prerequisite to 738. 3 + 3 q.h.

739. *Selecting Textile Fabrics.* An intensive study of materials used in women's, men's, infants' and children's wearing apparel and in house furnishings and domestics. Designed both to enable buyers and salespeople to select the correct materials and to provide the necessary merchandising information. Prereq.: Merchandising 738 or consent of the teacher. 3 q.h.

740. *Merchandising of Women's Fashions.* A course designed to familiarize the student with trends and cycles in European and American markets, the coordination of styling and fashion promotion for women's apparel, and the determination of value in buying and selling women's merchandise. Prereq.: Merchandising 738 or consent of the teacher. 3 q.h.

811. *Merchandising Techniques I.* Designed to provide mastery of the tools that will be used in buying, pricing, stock control and the analysis of statistical data. A collection of up-to-date mathematical problems and cases faced by the retailer are analyzed in making managerial decisions. Prereq.: Merchandising 711 or consent of instructor. 3 q.h.

812. *Merchandising Techniques II.* 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. Prereq.: Merchandising 811. 3 q.h.

813. *Marketing Research.* Introduction to the major areas of research in marketing including definition of problems, sources of information steps in the research process, market and sales analysis, market and sales potential studies, sampling, sales forecasting, product development, advertising, and qualitative research problems and procedures. Description of survey, observational and experimental types of research techniques. Review of research problems, approaches and trends in industrial, retailing, wholesaling, trade association, advertising agency, publishing and consulting firms. Prereq.: Merchandising 624 and Economics 704 and senior standing. 3 q.h.

814. *Marketing Field Studies.* A practical course in marketing research. In cooperation with a local firm, the student will develop field interviewing techniques, design questionnaires, design sampling sets, analyze the market, interpret the facts, and present his research findings in a written report. Prereq.: Merchandising 813. 3 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.: Merchandising 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.

841. *Industrial Purchasing I.* Presents the organization, principles and procedures of industrial purchasing. Topics included are standardization, quality control, inspection, stores control, right price, right source, research planning and forecasting. Case studies are used and field trips are taken to various industries in the area. Prereq.: Merchandising 720. 3 q.h.

842. *Industrial Purchasing II.* Consideration of materials budgets, value analysis, nego-

tiation, make or buy, capital equipment, systems, policies, ethics, legal aspects, contract cancellations, and evaluating purchasing performances. Case studies are used and field trips are taken to various industries in the area. Prereq.: Merchandising 841. 3 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.: Merchandising 709 or 720 or consent of the teacher. 3 q.h.

851. *Seminar.* Each student undertakes original research in some phase of merchandising or the merchandising business and presents his findings to the class, who study and discuss them. Prereq.: senior standing with a major in merchandising. 1–3 q.h.

PUBLIC ADMINISTRATION

For the combined major in Public Administration, see Business Organization.

TRANSPORTATION MANAGEMENT

For the major in Transportation Management, see Business Organization.

CURRICULUMS

Required or Suggested 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 189 to 205 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 Modifications for R.O.T.C. Students, in the General Requirements and Regulations section.

ACCOUNTING

The Accounting curriculum requires a total of 205 hours.

First Year	Hrs.
Acctg. 601, 602, 603 Elementary Accounting I, II, III	9
Comm. 505–506–507 Basic Courses I–II–III	9
Math. 542 Special Topics of Algebra	5
Math. 550 Introduction to Calculus	5
Science electives	9
Social Studies electives	9
H. & P. E. 509C Health Education	3
H. & P. E. activity courses	3
	52

Second Year	Hrs.
Acctg. 701–702 Intermediate Accounting I–II	10
Acctg. 710 Basic Concepts of Data Processing	3
Comm. 508 Basic Course IV	3
Econ. 601, 602, 603 Principles of Economics I, II, III	9
English: any two 600-level literature courses	6
Hist. 601, 602, 603 The United States I, II, III or Hist. 651, 652, 653 Western Civilization I, II, III	9
Mdsg. 624 Marketing	5
Psych. 601 General Psychology	4
H. & P. E. activity courses	3
	52

Third Year	Hrs.
Acctg. 713 Basic Cost Accounting	4
Acctg. 714 Advanced Cost Accounting	4
Acctg. 801 Advanced Accounting	5
Bus. Org. 701, 702, 703 Law I, II, III	9
Bus. Org. 712 Business Letters	3
Bus. Org. 720 Business Finance	4
Bus. Org. 725 Fundamentals of Management	5
Econ. 704, 705 Economics and Social Statistics I, II	6
Philosophy and Religion elective or Humanities elective	4
Speech 614 Business and Professional Speech	3
Electives	4
	51

Fourth Year	Hrs.
Acctg. 807 Auditing	4
Acctg. 813 Federal Tax Theory	4
Acctg. 814 Federal Tax Practice	4
Accounting electives (Upper Division)	6
Bus. Org. 722 Insurance Fundamentals	3
Bus. Org. 750 Human Behavior in Organization	4
Bus. Org. 850 Development of Executive Ability or Bus. Org. 819 Production Management	3–4
Econ. 803 Business and Government or Econ. 805 Business Cycles and Economic Growth	3
Economics elective (Upper Division)	3
Electives (Upper Division)	7
Electives	9–8
	50

ADVERTISING AND PUBLIC RELATIONS

The Advertising and Public Relations curriculum requires a total of 189 hours.

First Year	Hrs.
Art 510 Color and Design I	3
Bus. Org. 511 Introduction to Business	3
Comm. 505–506–507 Basic Courses I–II–III	9
Math. 531 Mathematics of Business or Math. 542 Special Topics of Algebra	5
Mdsg. 624 Marketing	5
Science electives	9
Social Studies electives	9
H. & P. E. 509C Health Education	3
H. & P. E. activity courses	3
	49

Second Year	Hrs.
Acctg. 601, 602, 603 Elementary Accounting I, II, III	9
Adv. PR. 627, 628 Advertising Principles I, II	6
Adv. PR. 629 Advertising Procedures	3
Comm. 508 Basic Course IV	3
Econ. 601, 602, 603 Principles of Economics I, II, III	9
Hist. 601, 602, 603 The United States I, II, III or Hist. 651, 652, 653 Western Civilization I, II, III	9
Mdsg. 625 Salesmanship	3
Psych. 601 General Psychology	4
H. & P. E. activity courses	3
	49

Third Year	Hrs.
Adv. PR. 710 Basic Public Relations	3
Adv. PR. 729 Advertising Copywriting	3
Adv. PR. 730, 731 Advertising Copy-Layout I, II	6
Adv. PR. 753 Introduction to Journalism	3
Adv. PR. 755 News Reporting and Writing	3
Adv. PR. 757 Editing and Make-up	3
Art 623 Advertising Art I	3
Bus. Org. 701 Law I	3
Bus. Org. 712 Business Letters	3
Bus. Org. 720 Business Finance	4
English: any two 600-level literature courses	6
Philosophy and Religion elective or Humanities elective	4
Elective	3
	47

Fourth Year	Hrs.
Adv. PR. 810 Advanced Public Relations	3
Adv. PR. 811 Direct Mail Advertising	3
Adv. PR. 814 Advertising Case Studies	3
Adv. PR. 815 Radio and Television Advertising	3
Adv. PR 821 Advertising Problems and Campaigns I	3
Adv. PR. 822 Advertising Problems and Campaigns II or Elective (Upper Division)	3
Bus. Org. 725 Fundamentals of Management	5
Bus. Org. 750 Human Behavior in Organization	4
Bus. Org. 855 Business Ethics	2
Econ. 704 Economics and Social Statistics I	3
Mdsg. 813 Marketing Research	3
Mdsg. 820 Sales Promotion or Elective (Upper Division)	3
Electives (Upper Division)	6
	44

COMMERCIAL ART

The Commercial Art curriculum requires a total of 197 hours.

First Year	Hrs.
Art 510, 511 Color and Design	6
Art 513 Survey of Art	3
Bus. Org. 511 Introduction to Business	3
Comm. 505–506–507 Basic Courses I–II–III	9
Math. 531 Mathematics of Business	5
Science electives	9
Social Studies electives	9
H. & P. E. activity courses	3
H. & P. E. 509C Health Education	3
	50

Second Year	Hrs.
Acctg. 601, 602, 603 Elementary Accounting I, II, III	9
Adv. PR. 627, 628 Advertising Principles I, II	6
Adv. PR. 629 Advertising Procedures	3
Art 601, 602 Drawing	6
Art 611 Printmaking	3
Comm. 508 Basic Course IV	3
Econ. 601, 602, 603 Principles of Economics I, II, III	9
Mdsg. 624 Marketing	5
Psych. 601 General Psychology	4
H. & P. E. activity courses	3
	51

Third Year	Hrs.
Adv. PR. 710 Basic Public Relations	3
Adv. PR. 729 Advertising Copywriting	3
Adv. PR. 730, 731 Advertising Copy-Layout I, II	6
Art 623, 624 Advertising Art I, II	6
Art 606 Beginning Painting or Art 625 Advertising Art III	3
Art 705 Advanced Drawing	3
Bus. Org. 701 Law I	3
Bus. Org. 712 Business Letters	3
Bus. Org. 720 Business Finance	4
English: any two 600-level literature courses	6
Hist. 601, 602, 603 The United States I, II, III or Hist. 651, 652, 653 Western Civilization I, II, III	9
	49

Fourth Year	Hrs.
Adv. PR. 821 Advertising Problems and Campaigns I	3
Art 727, 728 Advanced Advertising Art I, II	6
Art 729 Advanced Advertising Art III or Art elective (Upper Division)	3
Bus. Org. 725 Fundamentals of Management	5

Bus. Org. 750 Human Behavior in Organization	4
Business Organization elective (Upper Division)	3
Econ. 704 Statistics I	3
Mdsg. 733 Furnishings	3
Mdsg. 737 Textile Fabrics I	3
Mdsg. 820 Sales Promotion or Merchandising elective (Upper Division)	3
Philosophy and Religion elective or Humanities elective	4
Electives (Upper Division)	7
	47

FINANCIAL MANAGEMENT

Suggested Curriculum for the Degree of Bachelor of Science in Business Administration with the Major in Financial Management and a Suggested Minor in Economics.

The Financial Management curriculum requires a total of 205 hours.

First Year	Hrs.
Comm. 505–506–507 Basic Courses I–II–III	9
Math. 542 Special Topics of Algebra	5
Math. 550 Introduction to Calculus	5
Mdsg. 624 Marketing	5
Science electives	9
Social Studies electives	9
Elective	3
H. & P. E. 509C Health Education	3
H. & P. E. activity courses	3
	51

Second Year	Hrs.
Acctg. 601, 602, 603 Elementary Accounting I, II, III	9
Comm. 508 Basic Course IV	3
Econ. 601, 602, 603 Principles of Economics I, II, III	9
English: any two 600-level literature courses	6
Hist. 601, 602, 603 The United States I, II, III or Hist. 651, 652, 653 Western Civilization I, II, III	9
Philosophy and Religion elective or Humanities elective	4
Psych. 601 General Psychology	4
Elective in Computer Technology	3
H. & P. E. activity courses	3
	50

Third Year	Hrs.
Acctg. 713 Basic Cost Accounting	4
Acctg. 714 Advanced Cost Accounting or Acctg. 813 Federal Tax Theory	4
Bus. Org. 701, 702, 703 Law I, II, III	9
Bus. Org. 712 Business Letters	3
Bus. Org. 720 Business Finance	4
Bus. Org. 722 Insurance Fundamentals	3
Bus. Org. 725 Fundamentals of Management	5
Bus. Org. 730 Investment Analysis and Management	3
Bus. Org. 750 Human Behavior in Organization	4
Econ. 701 Money and Banking	3
Econ. 704, 705, 706 Economics and Social Statistics I, II, III	9
	51

Fourth Year	Hrs.
Bus. Org. 713 Report Writing	3
Bus. Org. 717 Real Estate Principles	3
Bus. Org. 718 Real Estate Finance and Problems	3
Bus. Org. 723 Life Insurance	3
Bus. Org. 724 Credit Management	3
Bus. Org. 731 The Stock Market	3
Bus. Org. 835 Advanced Business Finance	5
Bus. Org. 850 Development of Executive Ability	3
Bus. Org. 855 Business Ethics	2
Econ. 712, 713 Intermediate Macro-economics I, II	6
Econ. 811 Theory of International Trade	3
Mdsg. 813 Marketing Research	3
Electives	13
	53

The following courses are suggested as electives:

Acctg. 810 Statement Analysis
Adv. PR. 710 Basic Public Relations
Bus. Org. 804 Personnel Management
Bus. Org. 833 Public Utilities
Econ. 703 Monetary and Fiscal Policy
Econ. 708 Economics of American Industry
Econ. 710 Intermediate Micro-economics Theory I
Hist. 744 The History of American Business
Mdsg. 726 Dynamic Thinking
Mdsg. 831 Executive Protocol
Pol. Sci. 700 The American Executive
Pol. Sci. 701 The American Legislature
Pol. Sci. 712 Political Behavior
Pol. Sci. 720 Public Administration
Soc. 706 Industrial Sociology
Soc. 709 Social Control
Sp. & Dr. 614 Business and Professional Speech

GENERAL ADMINISTRATION

The General Administration curriculum requires a total of 197 hours.

First Year	Hrs.
Bus. Org. 511 Introduction to Business	3
Comm. 505–506–507 Basic Courses I–II–III	9
Math. 531 Mathematics of Business or Math. 542 Special Topics of Algebra	5
Mdsg. 624 Marketing	5
Psych. 601 General Psychology	4
Science electives	9
Social Studies electives	9
H. & P. E. 509C Health Education	3
H. & P. E. activity courses	3
	50

Second Year	Hrs.
Acctg. 601, 602, 603 Elementary Accounting I, II, III	9
Adv. PR. 627, 628 Advertising Principles I, II	6
Adv. PR. 629 Advertising Procedures	3

Comm. 508 Basic Course IV	3
Econ. 601, 602, 603 Principles of Economics I, II, III	9
English: any two 600-level literature courses	6
Hist. 601, 602, 603 The United States I, II, III or Hist. 651, 652, 653 Western Civilization I, II, III	9
Mdsg. 625 Salesmanship	3
H. & P. E. activity courses	3
	51

Third Year	Hrs.
Acctg. 709 Managerial Accounting	3
Acctg. 713 Basic Cost Accounting or Acctg. 810 Statement Analysis	4–3
Adv. PR. 710 Basic Public Relations	3
Bus. Org. 701, 702 Law I, II	6
Bus. Org. 712 Business Letters	3
Bus. Org. 720 Business Finance	4
Bus. Org. 722 Insurance Fundamentals	3
Bus. Org. 725 Fundamentals of Management	5
Bus. Org. 750 Human Behavior in Organization	4
Econ. 704 Economics and Social Statistics I	3
Mdsg. 709 Retail Marketing or Mdsg. 711 Management of Retail Buying or Mdsg. 720 Industrial Marketing	3
Elective in Computer Technology	3
Electives	3–4
	47

Fourth Year	Hrs.
Bus. Org. 705 Principles of Transportation	5
Bus. Org. 713 Report Writing	3
Bus. Org. 724 Credit Management	3
Bus. Org. 730 Investment Analysis and Management	3
Bus. Org. 740 Office Management and Methods	3
Bus. Org. 804 Personnel Management	4
Bus. Org. 855 Business Ethics	2
Business Organization elective or elective (Upper Division)	3
Econ. 803 Business and Government	3
Econ. 810 Business Economics	3
Econ. 831 Labor Markets	4
Mdsg. 811, 812 Merchandising Techniques I, II or Mdsg. 841, 842 Industrial Purchasing I, II	6
Philosophy and Religion elective or Humanities elective	4
Elective	3
	49

INDUSTRIAL MANAGEMENT

The Industrial Management curriculum requires a total of 205 hours.

First Year	Hrs.
Comm. 505–506–507 Basic Courses I–II–III	9
Math. 542 Special Topics of Algebra	5
Math. 550 Introduction to Calculus	5
Mdsg. 624 Marketing	5
Mdsg. 625 Salesmanship or elective	3
Science electives	9
Social Studies electives	9
H. & P. E. 509C Health Education	3
H. & P. E. activity courses	3
	51

Second Year	Hrs.
Acctg. 601, 602, 603 Elementary Accounting I, II, III	9
Comm. 508 Basic Course IV	3
Econ. 601, 602, 603 Principles of Economics I, II, III	9
English: any two 600-level literature courses	6
Hist. 601, 602, 603 The United States I, II, III or Hist. 651, 652, 653 Western Civilization I, II, III	9
Philosophy and Religion elective or Humanities elective	4
Psych. 601 General Psychology	4
Sp. & Dr. 614 Business and Professional Speech	3
H. & P. E. activity courses	3
	50

Third Year	Hrs.
Acctg. 713 Basic Cost Accounting	4
Acctg. 714 Advanced Cost Accounting or Acctg. 813 Federal Tax Theory	4
Adv. PR. Basic Public Relations or elective	3
Bus. Org. 701, 702, 703 Law I, II, III	9
Bus. Org. 705 Principles of Transportation	5
Bus. Org. 712 Business Letters	3
Bus. Org. 720 Business Finance	4
Bus. Org. 722 Insurance Fundamentals	3
Bus. Org. 725 Fundamentals of Management	5
Bus. Org. 750 Human Behavior in Organization	4
Econ. 704, 705 Economics and Social Statistics I, II	6
Elective in Computer Technology	3
	53

Fourth Year	Hrs.
Bus. Org. 713 Report Writing	3
Bus. Org. 730 Investment Analysis and Management	3
Bus. Org. 804 Personnel Management	4
Bus. Org. 819 Production Management	4
Bus. Org. 820 Production Control	4
Bus. Org. 851 Problems in Industrial Management	3
Bus. Org. 855 Business Ethics	2
Business Organization elective (Upper Division)	3
Econ. 706 Economics and Social Statistics III	3
Econ. 712, 713 Intermediate Macro-economics I, II	6
Mdsg. 841, 842 Industrial Purchasing I, II	6
Electives	10
	51

MERCHANDISING

The Merchandising curriculums require a total of 189 hours.

First Year	Hrs.
Bus. Org. 511 Introduction to Business	3
Comm. 505–506–507 Basic Courses I–II–III	9

Geog. 519 Economic Geography	5
Math. 531 Mathematics of Business or Math. 542 Special Topics of Algebra	5
Mdsg. 624 Marketing	5
Science electives	9
Social Studies electives	9
H. & P. E. 509C Health Education	3
H. & P. E. activity courses	3
	51

Second Year	Hrs.
Acctg. 601, 602, 603 Elementary Accounting I, II, III	9
Adv. PR. 627, 628 Advertising Principles I, II	6
Adv. PR. 629 Advertising Procedures	3
Comm. 508 Basic Course IV	3
Econ. 601, 602, 603 Principles of Economics I, II, III	9
Hist. 601, 602, 603 The United States I, II, III or Hist. 651, 652, 653 Western Civilization I, II, III	9
Mdsg. 625 Salesmanship	3
Psych. 601 General Psychology	4
H. & P. E. activity courses	3
	49

Specialization in Industrial Merchandising

Third Year	Hrs.
Acctg. 713 Basic Cost Accounting	4
Adv. PR. 710 Basic Public Relations	3
Bus. Org. 701, 702 Law I, II	6
Bus. Org. 712 Business Letters	3
Bus. Org. 725 Fundamentals of Management	5
Bus. Org. 746 Industrial Traffic Management	3
English: any two 600-level literature courses	6
Mdsg. 720 Industrial Marketing	3
Mdsg. 731 Non-Textiles: Apparel Accessories or Mdsg. 733 Furnishings	3
Mdsg. 737 Textile Fabrics I or Merchandising elective (Upper Division)	3
Mdsg. 738 Textile Fabrics II or Merchandising elective (Upper Division)	3
Elective	3
	45

Fourth Year	Hrs.
Bus. Org. 720 Business Finance	4
Bus. Org. 724 Credit Management	3
Bus. Org. 750 Human Behavior in Organization	4
Econ. 704 Economics and Social Statistics I	3
Mdsg. 726 Dynamic Thinking or Mdsg. 820 Sales Promotion	3
Mdsg. 813 Marketing Research	3
Mdsg. 825 Marketing Management	3
Mdsg. 840 Blueprint Reading	3
Mdsg. 841, 842 Industrial Purchasing I, II	6
Mdsg. 845 International Marketing	3
Merchandising electives (Upper Division)	5
Philosophy and Religion elective or Humanities elective	4
	44

Specialization in Retail Merchandising

Third Year	Hrs.
Adv. PR. 710 Basic Public Relations	3
Adv. PR. 729 Advertising Copywriting	3
Bus. Org. 701, 702 Law I, II	6
Bus. Org. 712 Business Letters	3
Bus. Org. 720 Business Finance	4
Bus. Org. 725 Fundamentals of Management	5
English: any two 600-level literature courses	6
Mdsg. 709 Retail Marketing	3
Mdsg. 731 Non-Textiles: Apparel Accessories or Mdsg. 733 Furnishings	3
Mdsg. 735 Visual Merchandise Presentation or Mdsg. 820 Sales Promotion	3
Mdsg. 737, 738 Textile Fabrics I, II	6
	45

Fourth Year	Hrs.
Bus. Org. 724 Credit Management	3
Bus. Org. 750 Human Behavior in Organization	4
Bus. Org. 804 Personnel Management	4
Econ. 704 Economics and Social Statistics I	3
Mdsg. 711 Management of Retail Buying	3
Mdsg. 726 Dynamic Thinking or Mdsg. 825 Marketing Management	3
Mdsg. 739 Selecting Textile Fabrics or Mdsg. 827 Chain Store Management	3
Mdsg. 811, 812 Merchandising Techniques I, II	6
Mdsg. 813 Marketing Research	3
Merchandising electives (Upper Division)	5
Philosophy and Religion elective or Humanities elective	4
Elective	3
	44

PUBLIC ADMINISTRATION

Suggested Curriculum for the Degree of Bachelor of Science in Business Administration with the Major in Public Administration and a Suggested Minor in Economics.

The Public Administration curriculum requires a total of 205 hours.

First Year	Hrs.
Bus. Org. 511 Introduction to Business	3
Comm. 505–506–507 Basic Courses I–II–III	9
Geog. 519 Economic Geography	5
Math. 542 Special Topics of Algebra	5
Mdsg. 624 Marketing	5
Science electives	9
Social Studies electives: Pol. Sci. 600 Elements of American Government (3); Pol. Sci. 601 American National Government (3); and Pol. Sci. 602 American State and Local Government (3)	9
H. & P. E. 509C Health Education	3
H. & P. E. activity courses	3
	51

Second Year	Hrs.
Acctg. 601, 602, 603 Elementary Accounting I, II, III	9
Comm. 508 Basic Course IV	3

Econ. 601, 602, 603 Principles of Economics I, II, III	9
English: any two 600-level literature courses	6
Hist. 601, 602, 603 The United States I, II, III or Hist. 651, 652, 653 Western Civilization I, II, III	9
Psych. 601 General Psychology	4
Soc. 600 Introduction to Sociology	5
Sp. & Dr. 614 Business and Professional Speech	3
H. & P. E. activity courses	3
	51

Third Year	Hrs.
Acctg. 713 Basic Cost Accounting	4
Acctg. 714 Advanced Cost Accounting or Acctg. 813 Federal Tax Theory	4
Adv. PR. 710 Basic Public Relations	3
Bus. Org. 701 Law I	3
Bus. Org. 712 Business Letters	3
Bus. Org. 720 Business Finance	4
Bus. Org. 725 Fundamentals of Management	5
Econ. 702 Public Finance	3
Econ. 704 Economics and Social Statistics I	3
Philosophy and Religion electives or Humanities elective	4
Pol. Sci. 704 American Political Parties	3
Pol. Sci. 720 Public Administration	3
Elective in Computer Technology	3
Electives	7
	52

Fourth Year	Hrs.
Acctg. 820 Governmental Accounting	4
Bus. Org. 740 Office Management and Methods	3
Bus. Org. 750 Human Behavior in Organization	4
Bus. Org. 804 Personnel Management	4
Bus. Org. 833 Public Utilities	3
Bus. Org. 850 Development of Executive Ability	3
Bus. Org. 855 Business Ethics	2
Econ. 803 Business and Government	3
Econ. 831 Labor Markets	4
Mdsg. 720 Industrial Marketing	3
Pol. Sci. 721 Urban Government	3
Pol. Sci. 801 Select Problems, Public Administration	3
Soc. 707 Urban Sociology	3
Electives	9
	51

The following courses are suggested as electives:

Bus. Org. 713 Report Writing
Bus. Org. 717 Real Estate Principles
Bus. Org. 722 Insurance Fundamentals
Bus. Org. 730 Investment Analysis and Management
Bus. Org. 835 Advanced Business Finance
Econ. 703 Monetary and Fiscal Policy
Econ. 705 Economics and Social Statistics II
Econ. 708 Economics of American Industry
Econ. 710 Intermediate Micro-economics Theory I
Econ. 712 Intermediate Macro-economics I
Econ. 811 Theory of International Trade I
Hist. 744 The History of American Business
Mdsg. 726 Dynamic Thinking
Mdsg. 813 Marketing Research
Mdsg. 831 Executive Protocol
Pol. Sci. 700 The American Executive
Pol. Sci. 701 The American Legislature
Pol. Sci. 780 Political Thought
Sp. & Dr. 617 Broadcasting
Soc. 700 Minority Groups
Soc. 703 The Sociology of Aging
Soc. 706 Industrial Sociology
Soc. 709 Social Control
Soc. 735 Juvenile Delinquency
Soc. 736 Criminology I

TRANSPORTATION MANAGEMENT

The Transportation Management curriculum requires a total of 197 hours.

First Year	Hrs.
Comm. 505–506–507 Basic Courses I–II–III	9
Geog. 519 Economic Geography	5
Math. 542 Special Topics of Algebra	5
Math. 550 Introduction to Calculus	5
Science electives	9
Social Studies electives	9
H. & P. E. 509C Health Education	3
H. & P. E. activity courses	3
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Second Year	Hrs.
Acctg. 601, 602, 603 Elementary Accounting I, II, III	9
Comm. 508 Basic Course IV	3
Econ. 601, 602, 603 Principles of Economics I, II, III	9
English: any two 600-level literature courses	6
Hist. 601, 602, 603 The United States I, II, III or Hist. 651, 652, 653 Western Civilization I, II, III	9
Mdsg. 624 Marketing	5
Psych. 601 General Psychology	4
Philosophy and Religion elective or Humanities elective	4
H. & P. E. activity courses	3
	52

Third Year	Hrs.
Acctg. 713 Basic Cost Accounting	4
Acctg. 714 Advanced Cost Accounting or elective	4
Bus. Org. 701, 702, 703 Law I, II, III	9
Bus. Org. 705 Principles of Transportation	5
Bus. Org. 707 Commercial Motor Transportation	5
Bus. Org. 712 Business Letters	3
Bus. Org. 720 Business Finance	4
Bus. Org. 725 Fundamentals of Management	5
Bus. Org. 746 Industrial Traffic Management	3
Econ. 704, 705 Economics and Social Statistics I, II	6
Elective in Computer Technology	3
	51

Fourth Year	Hrs.
Acctg. 810 Statement Analysis or Bus. Org. 730 Investment Analysis and Management	3
Adv. PR. 710 Basic Public Relations	3
Bus. Org. 713 Report Writing	3
Bus. Org. 722 Insurance Fundamentals	3
Bus. Org. 750 Human Behavior in Organization	4
Bus. Org. 804 Personnel Management	4
Bus. Org. 808 Water Transportation	3
Bus. Org. 816 Problems in Transportation	3
Bus. Org. 833 Public Utilities	3
Bus. Org. 855 Business Ethics	2
Econ. 803 Business and Government	3
Econ. 811 Theory of International Trade I	3
Mdsg. 841, 842 Industrial Purchasing I, II	6
Elective	3
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The School of Education

Joseph Franklin Swartz, Dean

ORGANIZATION AND DEGREES

The School of Education is primarily an Upper Division school and has four departments: Foundations of Education, Elementary Education, Secondary Education and Special Education. With the cooperation of the College of Arts and Sciences, the School of Business Administration, and the Dana School of Music, it prepares teachers for both public and private schools.

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 or Special Education or in one of the many teaching field areas in secondary or special field teaching.

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, etc., providing the student meets requirements for admission to Upper Division status in the School of Education and completes the proper preparatory sequences.

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. Specific details are given later.

OBJECTIVES OF TEACHER EDUCATION AT YOUNGSTOWN STATE UNIVERSITY

The School of Education promotes the general objectives of Youngstown State University. The Youngstown State University School of Education is especially concerned with serving its own community by preparing teachers who are aware of the characteristics of that community, its citizens, and its problems. The School of Education shares with the rest of the University a responsibility to the community and its schools by assisting and advising wherever possible. The education faculty also particularly endorses the University's policy of a broad liberal education combined with specialized training to develop the intellectual and professional potential of students. The staff feels strongly that liberal education extends the student's ability to benefit from professional training and to work successfully in his future professional life.

The philosophy of teacher education programs attempts to be consistent with established theory in the field, insofar as such theory is determinable. It is based upon a recognition of the importance of education in a democratic society, the need for excellence in teaching, and the key position of the teacher in the classroom. The faculty demands that students obtain a broad liberal education and plan a program of continuous study. In order to realize this goal, the staff considers the following to be the broad general objectives of our program of teacher education.

1. To provide specialized training for students who are preparing for a career in teaching:

   a. to demonstrate and to describe a wide variety of techniques and methods characteristic of good teaching;

   b. to introduce the student to the origin, nature, and current organization of the American elementary and secondary schools;

   c. to provide information regarding the characteristics and behavior of children of all ages;

   d. to continue to emphasize the importance of communication to successful teaching through the additional practice of speech and writing skills involved in education courses;

   e. to indicate the relationship of the field of education to other disciplines;

   f. to associate research with good teaching by citing research results, by indicating areas in which research is needed, and by showing students how techniques are applied in this field;

   g. to provide practical experiences for students by requiring each to complete supervised work in elementary school, secondary school, or both.

2. To encourage capable students to enter the field of teaching by establishing and maintaining high academic and personal standards as requirements for admission to such programs;

   a. to stress the necessity for each teacher to have knowledge in depth of the subject matter in each of his teaching fields;

   b. to prepare students for a life of service based upon a recognition of the vital role of the teacher in the American society;

c. to develop further in students the concept of the worth and dignity of each individual;

d. to identify those personality traits which generally characterize the successful teacher.

3. To conduct classes in an atmosphere of freedom conducive to free inquiry, creativity, and intellectual development, in order to exemplify the practice which it is expected that prospective teachers will follow.

4. To present the professional ethics applicable to the field of teaching.

5. To provide personal guidance so that each student may better understand himself through examination of his abilities, limitations, values, and goals.

a. to help the student decide upon an area of teaching in which he can contribute most to the education of the boys and girls;

b. to prepare the student to accept his need for a program of continuous study involving personal investigation, in-service training, and formal graduate 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 in accordance with the area of major emphasis:

1. The candidate for the elementary or Kindergarten-primary certificate normally earns a Bachelor of Science in Education degree. He may qualify for the Bachelor of Arts degree, but this will usually entail a greater number of credit hours.

2. The candidate for the secondary education certificate must major in one of his subject-matter teaching fields. Additional minor teaching fields may be added, or more than one major may be completed if desired. These require varying amounts of concentration. A separate bulletin available at the School of Education Office explains these requirements. The degree earned may be either a Bachelor of Science in Education or a Bachelor of Arts, in accordance with the requirements for these degrees.

A candidate for the special education certificate in the field of educable mentally retarded (slow learning) must complete all of the courses required for certification as prescribed by the State Department of Education.

3. Under certain conditions a student may earn a Bachelor of Arts degree with a major in Foundations of Education *but his program does not lead to a teaching certificate.*

4. A Dual Program may be undertaken that leads to certification at both the elementary and secondary levels. Under this program two majors are required, one in elementary education, and one in a high school teaching field. The degree earned is normally the Bachelor of Science in Education, but may be the Bachelor of Arts.

A Dual Program may be undertaken which leads to certification in both elementary education and special education. The degree earned is Bachelor of Science in Education. Under this program a social studies concentration area is required.

5. The degree of Bachelor of Science in Education is granted only to the student who qualifies for a teaching certifiicate.

6. Teaching certificates are awarded only upon application. The appropriate application form is available at the School of Education Office. Students anticipating certification must complete an application form and file it in the Education Office at the beginning of the

quarter in which the requirements are to be completed.

REQUIREMENTS FOR THE DEGREES

Bachelor of Science in Education and Bachelor of Arts

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; 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 193 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.

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 his courses, and a capacity for successful college work as determined by entrance tests. Currently a point average of 2.5 in at least 90 quarter hours of completed college work and satisfactory demonstration of competence in written and spoken English are required of each candidate in order to qualify for Upper Division status in the School of Education. The English competence may be shown by a percentile score of at least 40 on a comprehensive English test, or by satisfactory completion of a three-hour course in English proficiency.

Admission to the University does not guarantee admission to candidacy for a teaching certificate; this is controlled by the School of Education. The student must apply for admission to the 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 majors; 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. If they have not been met at this time the student is advised to reconsider his program and plan for some objective other than teaching. In any case, 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. The degree of Bachelor of Science in Education is granted only to the student who qualifies for a teaching certificate. He should take Education 501 in his

* This may be reduced to 190 quarter hours if Education 502 is not required. See course description for Education 502 under Foundations of Education.

** 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.

freshman year; this course explains the requirements fully. 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, *and the point index calculated for admission is based on all course work regardless of where it is completed.* The pre-education student is advised by the faculty in which his major is located.

The candidate for the Provisional High School Certificate must complete the requirements for a major in at least one teaching field; he should prepare for additional teaching fields either as minors or majors, if possible. He should observe carefully the requirements in the various fields as stated in pamphlets available from the School of Education.

The student who expects to teach in high school or elementary school should participate in extracurricular activities in order to be qualified to direct such activities.

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 faculty members in the School of Education.

2. Secondary education candidates, and candidates in the special certification fields of Art, Music, and Health 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.

EDUCATION 501 IS PREREQUISITE TO ANY OTHER COURSE IN EDUCATION UNLESS WAIVED BY THE DEAN OF THE SCHOOL OF EDUCATION.

FOUNDATIONS OF EDUCATION

Associate Professors Swan (chairman), Azneer and DiRusso; Assistant Professor Beckett; Instructors Battin, Heym, and Miller.

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 and proficiency. Enrollment is by permission of the School of Education only. This course is required on all programs leading to teacher certification, *unless waived on the basis of superior standing on a standardized English examination administered in Education 501.* If waived, the quarter hours for graduation may be reduced from 193 to 190. 3 q.h.

Upper Division Courses

(Open only to students who have been admitted to Upper Division status in the School of Education)

708. *Educational Sociology.* The sociological foundations of education; the relation of the individual and the social group; the school as a social institution; the relations between education and the home, the community, the state, social control, social progress, democracy, efficiency, and culture. The social aspects of specific school problems: the selection of educational objectives, the educational guidance, school control, moral education, and the selection and improvement of teachers. Required of all secondary education candidates, elective for others. 3 q.h.

710. *Educational Measurement and Guidance.* Construction, administration, scoring, and interpreting of objective examinations; selection, administration, of standardized tests and scales, and their use in vocational and educational guidance. Prereq.: junior or senior standing. Required of elementary candidates, elective for others. 4 q.h.

829. *Audio-Visual Education.* The aims and theory of audio-visual aids, and the use of various kinds of materials and projects; the relation of teaching practices to such aids, and their correlation with other aspects of teaching. Reports, demonstrations, and practice as operators. Elective. 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. Elective. 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. Elective. 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. Elective. 3 q.h.

ELEMENTARY EDUCATION

Professor Chrisp (chairman); Associate Professors Braden, Overby, and Vanaman; Assistant Professors Nichols and Roderick.

Upper Division Courses

(Open only to students who have been admitted to Upper Division status in the School of Education)

705. *Professional Laboratory Experiences: Elementary.* Observational and participatory experiences in actual elementary school situations under the direction of regular school teachers and administrative personnel. Students work as "teachers' aides" in assigned schools for one full school day (or two half-days) each week. Minimum time must be at least 6 hours weekly, but the full school time involved in 2 half-day or 1 full-day schedules must be met even if it exceeds 6 hours. In addition one hour of campus conference is required weekly. Course should be scheduled during the quarter following admission to Upper Division status in the School of Education and should precede the basic methods courses. Required of all regular elementary candidates. Prereq.: admission to Upper Division in the School of Education or consent of the Dean of the School of Education. 3 q.h.

713. *The Teaching of Arithmetic.* Principles in the learning of arithmetic and their application to its effective teaching. Required of all elementary candidates. 3 q.h.

714. *The Teaching of Social Science in the Elementary School.* Principles effective in the learning of history, geography and related social sciences and their application to the teaching of these subjects. Unit planning emphasized. 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.

801. *Purposes and Practices of the Elementary School.* An analysis of current education, its aims, its sources, its strengths and weaknesses. Current practices are traced to their contributors, from Pestalozzi and Froebel to the modern group, but the focus is 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 techniques of teaching reading in the elementary school at each level of advancement, adequate guidance of reading in all the various aspects of a broad program of instruction. Basic instruction in reading in the content fields, literature and recreational reading. 3 q.h.

813. *Language Arts II.* Teaching oral and written communication through consideration of listening, speaking, handwriting, spelling, reading, creative and formal writing in the elementary school. Teaching of word attack skills. 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 ages 4-6 years. Required for a Kindergarten-Primary certificate. Acquainting the child with his environment, expanding the child's understanding of his community with its responsibilities, and preparing the child for his role in society. 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 ages 4-6 years. Required for a Kindergarten-Primary certificate. A study of early kindergarten educators and their influence on the history and development of today's kindergarten program. Preparation of a workable environment for the 5-year-old 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 ages 4-6 years. 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.

SECONDARY EDUCATION

Professor Shipman (chairman); Associate Professors Schoenhard and Solak; Assistant Professors Beckett, Hammack, Knauf, and Turner.

Youngstown State University offers courses leading to high school certification in these fields: (They may be either majors or

minors, except as noted). Courses and Advisors for the major are provided by the Arts and Science College Department of the same name except where otherwise indicated.

Art (available as major for Special Certificate for grades 1–12 or High School minor); Biological Science, Bookkeeping (Accounting or General Business major, School of Business Administration), Bookkeeping-Basic Business (Accounting or General Business major, School of Business Administration); Business Education (Comprehensive Major, secretarial) (Major only); Business Education (Comprehensive Major, General Business) (Major only); Chemistry, Earth Science, Economics, English, French, General Science (Minor only), Geography, German, Health Education and Physical Education (available as a major for Special Certificate for grades 1–12 or High School minor); History and Government; Home Economics (Major only); Italian; Latin, Mathematics; Music (available as a major for Special Certificate for grades 1–12 or High School minor); Physical Science (minor only); Physics; Russian; Salesmanship-Merchandising (Advertising or Merchandising major in the School of Business Administration); Social Studies (Comprehensive major only); Sociology; Spanish; Speech; Stenography-typing (Minor only); Typing (Minor only).

(Open only to students who have been admitted to Upper Division status in the School of Education)

704. *Professional Laboratory Experiences: High School.* Observational and participatory experiences under the direction of regular high school teachers and administrative personnel. Students work as "teachers' aides" in assigned schools for one full school day (or two half-days) each week. Minimum time must be at least 6 hours weekly, but the full school time involved in 2 half-days or 1 full-day must be met even if it exceeds 6 hours. In addition, one hour of campus conference is required weekly. Course should be scheduled during the first quarter following admission to the School of Education and should precede or be scheduled concurrently with Education 706. Required of all regular high school, special, and dual candidates. Prereq.: admission to Upper Division status in the School of Education, or consent of the Dean of the School of Education.

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. Prerequisite or concurrent: Education 704. 3 q.h.

800. *Special Methods.* 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 public secondary schools; reports; term paper. Each student confers with the chairman of the department of his major teaching subject. (When the number of students justifies it, the course may be organized into a seminar of students having the same field of subject preparation. In such cases the course will be listed as Education 800L for foreign languages, 800E for English, etc.) This course is prerequisite to Education 842, Student Teaching. Prereq.: Education 706 and senior standing. 3 q.h.

850. *Teaching of Reading in Secondary and Advanced Subject Matter Areas.* A comprehensive survey of the elementary reading program as a basis for understanding the improving techniques that develop skills applicable to secondary students, with major emphasis, through secondary academic subject matter, on readiness, comprehension (factual, critical, organizational, reading-study), vocabulary development, word meaning, context, configuration, and picture clues, phonetic and structural analysis, dictionary usage, and silent and oral reading. This course no longer required for Pennsylvania Certification. 4 q.h.

SPECIAL EDUCATION

Associate Professors Clayton (chairman) and Smith.

Upper Division Courses

(Open only to students who have been admitted to Upper Division status in the School of Education)

732. *Education of Exceptional Children.* Prereq.: Admission to the School of Education. Required for special program in slow learners. 4 q.h.

833. *Teaching Slow Learners.* Problems, techniques, and aids, with opportunity to study individual problems: attention to curricular units, guidance, and planning. 4 q.h.

834. *Teaching the 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 Slow Learners: Social Studies.* Principles, practices, materials,

and aids in teaching social studies to slow learners; opportunities to study individual problems; attention to curriculum units; guidance, and planning. Prereq.: Education 732 and 833, or equivalent. 3 q.h.

852. *Principles and Practices in Curriculum Planning and Development for Slow Learners: Language Arts.* Principles, practices, materials, and aids in teaching language arts to slow learners; opportunities to study individual problems; attention to curriculum units, guidance, and planning. Prereq.: Education 732 and 833, or equivalent. 3 q.h.

853. *Principles and Practices in Curriculum Planning and Development for Slow Learners: Arithmetic.* Principles, practices, and aids in teaching arithmetic to slow learners; opportunity to study individual problems; attention to curriculum units, guidance, and planning. Prereq.: Education 732 and 833, or equivalent. 3 q.h.

854. *Preparation, Selection and Adaptation of Instructional Materials for Slow Learners.* A survey course of suitable instructional material for slow learners including administrative procedures, grouping principles, state standards, and textbooks. Prereq.: Education 732 and 833, or equivalent. 3 q.h.

855. *Occupational Orientation and Job Training.* Background and development of job training programs, covering aspects of occupational adjustment in terms of practical academic experiences and employment opportunities. Prereq.: Education 732 and 833 or equivalent. 3 q.h.

856. *Diagnosing Reading Difficulties.* A comprehensive survey of the elementary reading program. Selection, administration, scoring of various tests and techniques for examining the child with a reading problem. 3 q.h.

857. *Development of Remedial Reading Techniques.* Instructional techniques and procedures for meeting specific needs of children with reading difficulties—opportunities to examine materials, machines and other equipment for reading improvement. 3 q.h.

STUDENT TEACHING

Wilbert M. Hammack, Director.

841. *Supervised Student Teaching: Elementary.* Actual classroom teaching under the direction of experienced teachers and campus supervisors. Required of all elementary candidates. Scheduled during one of the senior year quarters, except that it is not offered in the summer quarter.

Application to take this course must be filed as follows: For fall, winter, or spring quarter scheduling, no later than May 1st of the year preceding the academic year in which student teaching is to be completed.

Prerequisites. Completion of the major methods courses (specifically Education 705, Educ. 713, and Educ. 812, 813): admission to Upper Division status in the School of Education (this requires that the candidate have a point index of 2.50 or higher in all college work; satisfactory completion of the English competence requirement; and a satisfactory record on a standardized elementary achievement test); and the recommendation and unqualified approval of the candidate's assigned School of Education adviser.

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 campus conferences are required and attendance at these conferences is *mandatory.* (Students failing to attend the first regularly scheduled conference will be automatically dropped.) Additional individual conferences with the campus supervisor, the course teacher, or with the regular classroom teacher may be called as needed, and must follow any 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. 15 q.h.

842. *Supervised Student Teaching: High School.* Actual classroom teaching under the direction of experienced teachers and campus supervisors. Required of all candidates for high school certificates. Scheduled during one of the senior year quarters, except that it is not offered in the summer quarter.

Application to take this course must be filed as follows: For fall, winter, or spring quarter scheduling, no later than May 1st of the year preceding the academic year in which student teaching is to be completed.

Prerequisites: Admission to Upper Division status in the School of Education and completion of Education 704, 706, 708 and of Education 800 or the equivalent special methods course in the special fields concerned—i.e., health and physical education, art, music, or home economics. (Waiver of the Education 800 prerequisite will normally not be allowed except to post-graduate students who are willing to take Education 800 concurrently. To do so, however, is not recommended, since both Education 800 and 842 make many demands upon the student.) A point index of 2.50 or higher in all college work; satisfactory completion of the English competence requirement; an average of B in two-thirds of the minimum subject field requirements with no subject field

course below C. The unqualified approval of the chairman of the department of each of the student's teaching fields and of the Dean of the School of Education.

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 campus conferences are required and attendance at these conferences is mandatory. (Students failing to attend the first regularly scheduled conference will be dropped automatically.) Additional individual conferences with the campus supervisor, the course instructor, or with the regular classroom teacher may be called as needed, and must follow any 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. 15 q.h.

843. *Supervised Student Teaching: Special Field and Dual Program.* Actual classroom teaching under the direction of experienced teachers and campus supervisors. Required of all candidates for *Special subject field certification* (do not confuse with special education for slow learning children, etc.) and for dual program certification (i.e. both elementary and high school certificates). Scheduled during one of the senior year quarters, except that it is not offered in the summer quarter.

Assignments will be in both elementary *and* secondary teaching situations, with approximately half of the total time for each situation. Teaching time will occupy the full school day for one entire quarter.

Application to take this course must be filed as follows: For fall, winter, or spring quarter scheduling, no later than May 1st of the year preceding the academic year in which student teaching is to be completed.

Prerequisites: Admission to Upper Division status in the School of Education, completion of Education 704, Education 706, and the appropriate special methods courses (i.e. Educ. 800, for dual candidates, HPE 711, 712, 713 for HPE candidates, Music 823, 824, 825 for Music candidates, or Art 723 for Art candidates). Also the unqualified approval of the Dean or Department Chairman of the subject area involved, and of the Dean of the School of Education is required. Admission to the School of Education involves special quality and performance standards.

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 campus conferences are required and attendance at these conferences is *mandatory.* (Students failing to attend the first regularly scheduled conference will be automatically dropped.) Additional individual conferences with the campus supervisor, the course teacher, or with the regular classroom teacher may be called as needed, and must follow any 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; therefore, the total campus load should be kept at the lowest feasible level because of the demanding nature of the responsibilities involved. 15 q.h.

860. *Supervised Student Teaching: Slow Learning Children.* Provision for observation and practice teaching in a Slow Learning Class. Actual classroom teaching under the direction of experienced teachers. 12 q.h.

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 a technical field, and in liberal arts. The basic science program, consisting of mathematics and the physical sciences, provides the basis for the technical program and increases the student's knowledge of the physical world around him. The technical program teaches the application of science to the problems of engineering. The liberal arts program is designed to teach the student to express himself clearly and to understand better both himself and other people, and thus deal more intelligently with the problems he will face as an engineer, as a citizen, and as an individual.

The student may major in chemical, civil, electrical, industrial, mechanical, or metallurgical 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 Building.

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 lb. Universal Testing Machine, three 120,000 lb. 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 *Metallurgical Engineering Laboratories,* located in the basement and first floor of the Engineering Science Building, include a field-ion microscope laboratory, electron microscope laboratory, multi-purpose radio-isotope 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 beneficiation laboratory.

The various metallurgical 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; dark room 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.

TUITION AND 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* 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 218 quarter hours of credit and are designed to be completed in four academic years. 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 adviser.**

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.

* 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 Business Organization 701, 702, 703.

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

Completion of at least 217 quarter hours.
Upper Division status (including completion of any specified preparatory course not completed at time of entrance).
Major and minor requirements
The major is a specialization in a branch of engineering. The minor is completed through the required courses in mathematics. See the year-by-year curriculums in each department.
Course-level requirements.
Residence requirement.
Application for graduation.

COURSE REQUIREMENTS (OTHER THAN THE MAJOR AND MINOR)

	QUARTER HOURS
BASIC COURSES	
Communication 505, 506, 507, 508 Basic Course I, II, III, IV	12
Health and Physical Education 509M or 509W Health Education	3
Health and Physical Education activity courses	6
AREA COURSES	
Social studies:	
Social Science 501, 502, and 503 Introduction to the Social Sciences I, II, III	9
History	3
Any 600-level history course. Chemical Engineering majors are excluded from this requirement.	
Economics 707 Economics of American Industry	3
Religion:	
A course in the Philosophy and Religious Studies department, or Humanities 830, 831, or 832 Older Classics I, II, III	4
Science:	
Chemistry 515–516–517 General Chemistry	12
or	
Chemistry 505–506–507–508 Fundamentals of Chemistry	15
(For students who have had no previous work in chemistry.)	
Physics 510, 601–602–603 General Physics	12
ENGINEERING COURSES	
Mechanical Engineering 501 Engineering Drawing	3
Mechanical Engineering 502 Engineering Drawing, Descriptive Geometry	3
Civil Engineering 610, 611, and 614	5
Chemical Engineering 614 Elementary Strength of Materials	3
OTHER COURSES	
English	3
Any 600-level literature course, or Humanities 631, Mythology in Literature. Chemical Engineering majors are excluded from this requirement.	
Mathematics 572, 573, 674, 675 Calculus I, II, III, IV	18

COURSES OF INSTRUCTION AND CURRICULUMS*

CHEMICAL ENGINEERING

Professor Luginbill (chairman); Associate Professors Sheng and Stevens.

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.: Mathematics 673, Chemistry 517. 3 q.h.

681. *Industrial Stoichiometry.* To aid the non-chemical engineer to organize, evaluate, and effectively utilize the information inherent in chemically stoichiometric relationships, as they apply to actual plant situations. Prereq.: Mathematics 673, Chemistry 517. 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.

682, 683, 684. *Principles of Chemical Engineering.* Orientation in the philosophy and attitudes needed in practice. An overall appraisal of the profession in terms of the practical application of theoretical physio-chemical principles. Illustrations of the proper analytical and evaluation procedures for solutions of problems in process design. The flow sheet; material; energy, and economic balances; static and dynamic equilibria; the transfer and transmission rates of heat. Prereq.: Mathematics 673, Chemistry 517. 3 + 3 + 3 q.h.

685. *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.: Mathematics 673, Chemistry 517. 3 q.h.

686. *Industrial Waste 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.: Mathematics 673, Chemistry 517. 3 q.h.

780, 781, 782. *Thermodynamics.* Macroscopic approach of the first and second laws of thermodynamics based on the open-system. Applications of both laws to fluid dynamics, refrigeration, power cycle, phase and chemical equilibria. Expanded treatment of energy balances and pressure-volume-temperature relations. Prereq.: Chemical Engineering 684, Mathematics 674. 2 + 2 + 2 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.: Mathematics 674, Chemical Engineering 684. 3 q.h.

784. *Fluid Flow.* Basic theory, calculation, measurement and control of fluid flow. Transportation of fluid. Fundamentals of fluidization and two-phase flow. Study of the relationship of chemical, toxic, and radioactive properties of fluids on the design of equipment needed for their handling. Prereq.: Chemical Engineering 684, Mathematics 674. 3 q.h.

784L. *Fluid Flow Laboratory.* Experimentation with various types of flow measurement and control devices. Correlation of effect of physical properties of fluids on their flow characteristics. Prereq.: To be taken concurrently with Chemical Engineering 784. 1 q.h.

785. *Heat Transfer.* Basic theory of conduction, convection and radiation and its application to both steady and unsteady chemical processes. Also included are study and design of heat transfer equipment in evaporation operations, and special attention to the best utilization of process stream enthalpies. Prereq.: Chemical Engineering 784–784L. 3 q.h.

785L. *Heat Transfer Laboratory.* Experimentation with various types of heat exchangers. Correlation of exchanger design best suited for specific process conditions. Calorimetry. Heats of combustion. Prereq.: To be taken concurrently with Chemical Engineering 785. 1 q.h.

786, 787, 788. *Unit Operations I, II, and III.* A thorough study of diffusional operations and equilibrium stages involving both mass and energy transfer. In addition, phase separations as crystallization, filtration, distillation, extraction, mixing and material handling will be discussed. Prereq.: Chemical Engineering 785–785L. 3 + 3 + 3 q.h.

786L, 787L, 788L. *Unit Operations Laboratory I, II, and III.* Taken concurrently with Chemical Engineering 786, 787, 788. 1 + 1 + 1 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 either the student or the dean of the engineering school. 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.

880, 881. *Kinetics.* 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.: Chemical Engineering 786–786L and Mathematics 709. 3 + 2 q.h.

882. *Process Dynamics.* Introduction to automatic control and control loop concepts, measurement of variables, dynamic properties of instruments, process response, discussions of controller types, derivation of equations for first and second order control systems, and derivation of equations for first and second order process. Prereq.: Chemical Engineering 881 and Mathematics 710. 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 analytic techniques. Prereq.: Chemical Engineering 881, Mathematics 710. 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 "scale-ups". Prereq.: Chemical Engineering 880, Chemical Engineering 787-787L. 3 + 3 q.h.

CIVIL ENGINEERING

Professor Cernica (chairman); Associate Professor Williamson; Assistant Professors Bellini, Ghaffarzadeh, Hibbeler, Householder and Ritter.

610. *Statics I.* Principles of mechanics as applied to statics with vector application to resultants of forces, centroids, and distributed loads, and equilibrium. Prereq.: Physics 510, Mathematics 572. 3 q.h.

611. *Statics II.* Continuation of Statics I to include friction, moments of inertia, and principle of virtual work. Prereq.: Civil Engineering 610. 2 q.h.

614. *Strength of Materials I.* Elementary theory in relationships between load, stress, strain in tension, compression, direct and torsional shear, and stresses in simple beams. Prereq.: Civil Engineering 611. 3 q.h.

615. *Strength of Materials II.* Stresses in indeterminate beams, deflection of beams, joints, column theory, and energy concepts. Prereq.: Civil Engineering 614. 2 q.h.

615L. *Strength of Materials II Laboratory.* Experimental verification of theories of Strength of Materials. Prereq.: Concurrently with Civil Engineering 615. 1 q.h.

718. *Fluid Mechanics I.* 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 flow in pipes and channels. Prereq.: Mechanical Engineering 741. 3 q.h.

718L. *Fluid Mechanics I Laboratory.* Engineering applications with selected laboratory experiments to illustrate the theory of fluid mechanics. Taken concurrently with Civil Engineering 718. 1 q.h.

719. *Hydraulic Engineering.* Civil engineering applications of fundamental fluid mechanics principles to open and closed channel flow including the basic concepts of hydraulic structures. Prereq.: Civil Engineering 718. 3 q.h.

720. *Surveying I.* The theory of surveying, and the use of instruments. Problems in leveling, traversing, and topography. Prereq.: Mathematics 572 and Mechanical Engineering 501. 3 q.h.

720L. *Surveying I Laboratory.* Field surveying principles and techniques. Uses of the transit, level, and plane table are stressed. Taken concurrently with Civil Engineering 720. 1 q.h.

721. *Surveying II.* A study involving the location, design, and construction of transportation systems, including route selection, horizontal and vertical alignment, earthwork calculation, and layout. Prereq.: Civil Engineering 720. 3 q.h.

721L. *Surveying II Laboratory.* Field application of surveying principles and techniques used in route location mapping and layout. Introduction to the Kelsh Plotter. Taken concurrently with Civil Engineering 721. 1 q.h.

724. *Transportation I.* Traffic engineering principles. Basic characteristics of vehicles and operators. Volume, speed, delay, capacity, accident, parking, and origin and destination studies. Techniques for improving traffic operations. Prereq.: Civil Engineering 720. 2 q.h.

724L. *Transportation I Laboratory.* Field studies of traffic volumes, intersection operations, traffic controls and parking. Taken concurrently with Civil Engineering 724. 1 q.h.

740. *Structural Analysis I.* Fundamental and systematic determination of reactions, shears, moments, and stresses in statically determinate beams, frames, trusses, arches, cables, and suspension bridges. Consideration of dead, live, moving, wind, thermal, and earthquake loads. Prereq.: Civil Engineering 615. 3 q.h.

741. *Structural Analysis II.* Elastic deflections of simple structures. Classical and numerical methods for computing beam deflections. General procedure for computing deflections in rigid frames. Energy relations in structural systems, real work and complementary work. Prereq.: Civil Engineering 740. 3 q.h.

820. *Surveying III.* Principles of photogrammetry, including reading, interpretations, and geometric characteristics of aerial photographs. Prereq.: Civil Engineering 721. 2 q.h.

820L. *Surveying III Laboratory.* Stereoscopic principles and their application in the production of planimetric and topographic maps. Taken concurrently with Civil Engineering 820. 1 q.h.

824. *Transportation II.* Route planning and engineering: economics, finance, design standards, plan preparation and construction supervision. Various modes of transportation studied. Prereq.: Civil Engineering 721. 3 q.h.

825. *Transportation III.* Design methods for flexible, rigid, and other wheel-supporting pavements. Prereq.: Civil Engineering 841 and/or concurrently with Civil Engineering 850. 2 q.h.

825L. *Transportation III Laboratory.* Design of pavement mixtures: proportioning and preparation of test specimens. Laboratory tests on materials to determine suitability for use in paving mixtures. Taken concurrently with Civil Engineering 825. 1 q.h.

826. *Transportation IV.* 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.: Civil Engineering 824. 3 q.h.

830. *Hydrology.* A study of the properties, distribution and behavior of water in nature as it appears in its three forms: precipitation, surface water, and subsurface water. Prereq.: Civil Engineering 719. 3 q.h.

831. *Environmental Engineering I.* A study of the elements and design of water supply and wastewater disposal systems, with emphasis on the determination of sources, quantity of flow, collection and treatment systems. Prereq.: Civil Engineering 719. 3 q.h.

832. *Environmental Engineering II.* A study of the elements of the water and wastewater treatment processes, with emphasis on physical, chemical and biological treatment. Prereq.: Civil Engineering 831. 2 q.h.

832L. *Environmental Engineering II Laboratory.* Laboratory studies to support the topics of Environmental Engineering II. Taken concurrently with Civil Engineering 832. 1 q.h.

833. *Environmental Engineering III.* A study of the elements of air pollution and its control. Prereq.: Civil Engineering 832. 3 q.h.

840. *Structural Analysis III.* Analysis of statically indeterminate beams, girders, bents, trusses, and multistory frames by exact and approximate methods utilizing concepts of strain-energy, virtual work, slope- deflection, and moment distribution. Prereq.: Civil Engineering 741. 3 q.h.

841. *Structural Design I.* Structural design of concrete beams, slabs, columns, walls, and footings. Investigation and proportioning of members and connections in accordance with the assigned specifications for elastic, ultimate, and prestressed concrete structures. Prerequisite or concurrent: Civil Engineering 741. 3 q.h.

842. *Structural Design II.* The application of structural theory to the design of steel structures, including beams, girders, columns, frames, and truss members. Selection of members and connections in accordance with assigned specifications. Brief discussion and structural design of other metals. Prerequisite or concurrent. Civil Engineering 741. 3 q.h.

843. *Systems Engineering I.* System approach to engineering design and operations involving deterministic models; linear programming, critical path scheduling and competitive strategies and their application to construction planning and other engineering problems. Prereq.: Mathematics 710. 3 q.h.

844. *Systems Engineering II.* System approach to engineering design and operation involving probabilistic models: queueing theory. Other stochastic processes and elementary decision theory and their application to transportation and other engineering problems. Prereq.: Civil Engineering 843. 3 q.h.

845. *Civil Engineering Analysis.* Application of mathematical and numerical methods to the systematic analysis and development of problems in the field of civil engineering. Prereq.: Civil Engineering 842. 3 q.h.

846. *Advanced Structural Analysis.* Matrix formulation and solution of complex structural problems; force and displacement methods using flexibility and stiffness-coefficient matrixes. Prereq.: Civil Engineering 840. 3 q.h.

847. *Structural Dynamics.* Principles and practices of dynamic design of structures. Prereq.: Civil Engineering 840. 3 q.h.

848. *Analysis and Design of Plate and Shell Structures.* Analysis and design of plate and shell-type structures with particular emphasis on these methods which yield practical solution to structural problems. Prereq.: Civil Engineering 840. 3 q.h.

850. *Soil Mechanics.* Properties of soils, soil classification, capillarity and permeability, stress and strain, shear, consolidation and compressibility, and seepage. Prereq.: Mathematics 710 and Civil Engineering 615. 3 q.h.

850L. *Soil Mechanics Laboratory.* Experimental application of the principles and procedures of soil testing. Taken concurrently with Civil Engineering 850. 1 q.h.

851. *Foundation Engineering.* Analysis and design of foundation structures: retaining walls, abutments, piers, piles, and footings; bearing pressures, movements and stability including embankments. Prereq.: Civil Engineering 850. 3 q.h.

852. *Advanced Soil Mechanics.* Stress-strain failure relationships for soils, shear phenomena and stability, lateral earth pressures, seepage, and consolidation. Prereq.: Civil Engineering 850. 3 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 adviser. Three bound copies are required; specifications are available on request. For credit, the thesis must be accepted by both the dean and the adviser. Prereq.: senior standing. 2 + 2 + 2 q.h.

ELECTRICAL ENGINEERING

Associate Professors Kramer (chairman), Richley, Siman, and Stein; Assistant Professors Goncz and Skarote.

601. *Circuit Theory I.* Basic principles of linear circuit theory. Network theorems and equations, and topology, phasor algebra, analysis of transient and steady state behavior of simple circuits. Prereq.: Mathematics 673, Physics 601. Concurrent: Mathematics 674, Physics 602. 3 q.h.

602. *Circuit Theory II.* Complex algebra, phasor diagrams, impedance and admittance; complex frequency, poles and zeroes. Bode diagrams; magnetically coupled circuits, transformers equivalent circuits; power and energy, average and effective values; three-phase circuits. Prereq.: Electrical Engineering 601. Concurrent: Mathematics 709, Physics 603, Electrical Engineering 612L. 3 q.h.

603. *Circuit Theory III.* Fourier Series and Integral with circuit applications, Laplace transforms; mechanical, electro-mechanical and other analogs, mixed systems, linear electronic circuits. Prereq.: Electrical Engineering 602. Concurrent: Electrical Engineering 613L. 3 q.h.

612L. *Electrical Laboratory I.* Introduction to digital computer programming; characteristics and capabilities of electrical instruments; measurement of resistance, capacitance, inductance, and impedance at audio frequencies. Concurrent: Electrical Engineering 602. 1 q.h.

613L *Electrical Laboratory II.* A laboratory study of electric circuits including resonant circuits, current and voltage loci, coupled circuits, network theorems, and circuit transients. Electrical Measurements. Prereq.: Electrical Engineering 612L. Concurrent: Electrical Engineering 603. 1 q.h.

701. *Circuit Theory IV.* Laplace transform analysis, zero-pole structure of network impedance functions, Foster's reactance theorem synthesis of simple networks. Prereq.: Electrical Engineering 603. 3 q.h.

702. *Circuit Theory V.* Properties and applications of frequency selective networks; design of image impedance filters, interstage networks and impedance matching networks; transient response of networks; matrices; circuit transfer; functions. Prereq.: Electrical Engineering 701. 3 q.h.

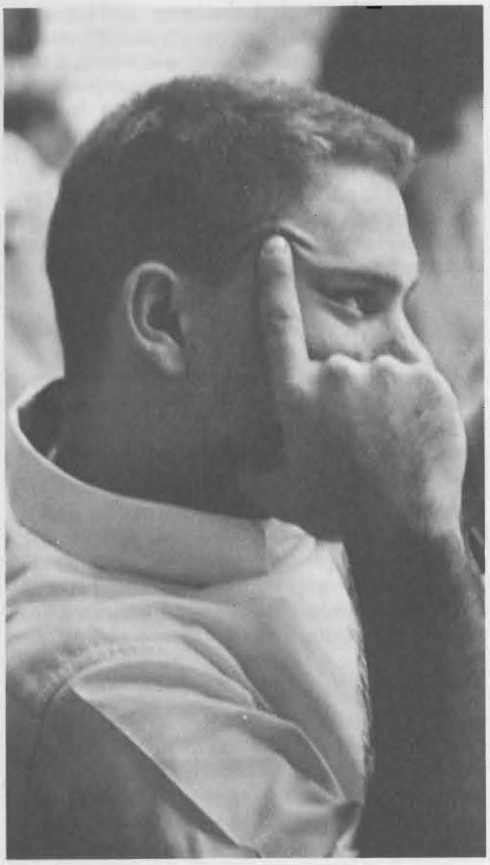
703. *Control Analysis I.* The characteristics of closed-loop automatic control systems, system behavior from classical and Laplace transform methods; stability, compensation methods, components for use in servo systems, analog computers. Prereq.: Electrical Engineering 702. 3 q.h.

704. *Field Theory I.* Vector relations, static electric fields, dielectric materials, boundary conditions, field mapping, steady electric currents and their magnetic fields, motion of charged particles. Prereq.: Physics 603, Mathematics 709. Concurrent: Mathematics 710. 3 q.h.

705. *Field Theory II.* Ferromagnetic materials, time changing electric and magnetic fields, Maxwell's equations, relations between field and circuit theory, plane waves, Poynting vector energy relations, boundary value problems. Prereq.: Electrical Engineering 704. Concurrent: Mathematics 711. 3 q.h.

706. *Transmission and Radiation.* General transmission theory, infinite line, terminated line, impedance transformation, waveguides simple antenna systems, group and phase velocity, impedance of waveguide. Prereq.: Electrical Engineering 705. Concurrent: Electrical Engineering 716L. 3 q.h.

707. *Physical Electronics I.* Physical theory of electron devices; terminal characteristics; large and small signal analysis of electron devices as circuit components; applications to rectification and to amplification; equivalent



circuits. Prereq.: Electrical Engineering 603, Electrical Engineering 704. Concurrent: Electrical Engineering 711L. 3 q.h.

708. *Electronic Circuit Theory II.* Multistage amplifier coupling; broadbanding; basic feedback analysis and applications; power amplifiers; Class B and C large signal analysis; single-frequency oscillators. Transfer Functions. Prereq.: Electrical Engineering 707. 3 q.h.

709. *Electronic Circuit Theory III.* Amplitude, angle frequency, and pulse modulation, modulators; demodulators; AM and FM; switching networks utilizing gaseous vacuum and semi-conductor devices, and transductors; control circuits system applications and transfer functions. Prereq.: Electrical Engineering 708. 3 q.h.

711L. *Electrical Laboratory III.* Transient analysis; determination characteristics of vacuum, gaseous, and solid state electron devices; power supplies, rectifiers, single stage amplifiers. Concurrent: Electrical Engineering 707. 1 q.h.

712L. *Electrical Laboratory IV.* Non sinusoidal waveform analysis; field plotting. Tube and transistor multistage amplifiers and broadbanding; audio and radio frequency power amplifiers; characteristics and equivalent circuits of linear motion and saturable core devices, general magnetic networks and transformers. Prereq.: Electrical Engineering 707. Concurrent: Electrical Engineering 708. 1 q.h.

713. *Electrical Engineering.* Introduction to circuit analysis; circuit analysis concepts and their extension to mechanical and thermal systems by analogy. Electrical instruments and measurements. (Not open to students majoring in Electrical Engineering). Prereq.: Physics 603, Mathematics 709, Mechanical Engineering 640. 3 q.h.

713L. *Electrical Engineering Laboratory.* To be taken concurrently with Electrical Engineering 713. 1 q.h.

714. *Electron Devices and Circuits.* Theory and application of semiconductors, transistors, photoelectric, vacuum and gas filled tubes. Study of amplifiers, oscillators, magnetic amplifiers, filters and circuits used in electronics. (Not open to students majoring in Electrical Engineering). Prereq.: Electrical Engineering 713. 3 q.h.

714L. *Electron Devices and Circuits Laboratory.* To be taken with Electrical Engineering 714. 1 q.h.

715. *Electrical Devices.* Introduction to the basic principles of analysis of electromechanical devices, study of automatic feedback control and instrumentation. The approach is organized to extend the circuit analysis concepts introduced in the prerequisite course. (Not open to students in Electrical Engineering). Prereq.: Electrical Engineering 713. 3 q.h.

715L. *Electrical Devices Laboratory.* To be taken concurrently with Electrical Engineering 715. 1 q.h.

716L. *Electrical Laboratory V.* Transmission line parameters; attenuation, magnitude, and phase of voltage, and current on lines; reflected waves; waveguide characteristics and techniques; filters antenna patterns and impedances. Microwave measurements. Concurrent: Electrical Engineering 706. 1 q.h.

717L. *Electrical Laboratory VI.* Modulation: demodulation of a modulated wave; production of shaped waveforms; switching and control circuit applications; design and evaluation of a single-frequency oscillator; filters. Concurrent: Electrical Engineering 709. 1 q.h.

718L. *Electrical Laboratory VII.* Laboratory study of feedback amplifiers, control systems and their components, operational amplifiers, and analog computers. Concurrent: Electrical Engineering 703. 1 q.h.

801, 802, 803. *Thesis.* The student prepares a written report of at least 2500 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.

804L. *Electrical Laboratory VIII.* Study of selected transient and steady-state performances of direct current, synchronous and induction machines. Concurrent: Electrical Engineering 811. 1 q.h.

805. *Quantum Electronics.* Electronic energy levels in quantum electronic devices; energy transitions in crystalline and gaseous media. Applications to semiconductors, masers and lasers. Prereq.: Electrical Engineering 706, Electrical Engineering 709, Physics 705. Concurrent: Mechanical Engineering 600. 3 q.h.

806L. *Quantum Electronics Laboratory.* Studies of semiconductor, maser and laser materials, devices; amplifiers, monochromatic sources, modulation and detection; frequency, wavelength and power measurements; plasma studies. Concurrent: Electrical Engineering 805. 1 q.h.

807. *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.: Electrical Engineering 708, Electrical Engineering 702. 3 q.h.

808. *Electronic Circuits Signals and Systems.* A continuation of Electrical Engineering 709 with emphasis on problems arising from communications and electronics areas. Correlation of classical differential equations approach to time and frequency domain 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.: Electrical Engineering 709. 3 q.h.

809. *Electrical Energy Conversion I.* Properties and theory of magnetic circuits as applied to electro-mechanical energy conversion. Transformers, non-linear magnetic devices. Introduction to rotating machine analysis. Prereq.: Electrical Engineering 706. 3 q.h.

810. *Electrical Energy Conversion II.* Field and circuit concepts of idealized rotating machines; steady and transient states; thermal transients; control machines and systems. Prereq.: Electrical Engineering 809. 3 q.h.

811. *Electrical Energy Conversion III.* Field and circuit concepts of realistic rotating machines; generalized two-phase machines as control components; magnetic amplifiers. Prereq.: Electrical Engineering 810. Concurrent: Electrical Engineering 804L. 3 q.h.

812. *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 superconductors electric and magnetic polarization; ferroelectricity and ferromagnetism; electromechanical and magnetic mechanical effects; influence of material properties on energy storage, conversion, and control. Prereq.: Electrical Engineering 706, Mechanical Engineering 741, Physics 705. 3 q.h.

813. *Logic Circuit Theory.* Synthesis of switching circuits using Boolean Algebra, coding, sequential switching circuits. Prereq.: Electrical Engineering 709. 3 q.h.

814L. *Digital Computer Laboratory.* Laboratory study of counting, arithmetic and digital circuits. Concurrent: Electrical Engineering 813. 1 q.h.

815. *Energy, Radiation and Propagation.* Dipole, loop, aperture, reflector, lens, surface wave and other antennas; array theory; radiation resistance, directivity and input impedance; traveling wave antennas. Prereq.: Electrical Engineering 706. 3 q.h.

816L. *Radiation Laboratory.* Measurements and interpretation of antenna field patterns, impedances, gains, and current distribution; microwave measurements. Concurrent: Electrical Engineering 815. 1 q.h.

817. *Control Analysis II.* Linear and nonlinear control systems compensation techniques in time and frequency domain; signal flow diagrams; multiple loop and multiple input feedback control systems. Prereq.: Electrical Engineering 703. 3 q.h.

819. *Plasma Dynamics.* Plasma kinetic theory; charged particle interaction; waves in plasma; plasma oscillation; magnetic fluid dynamics; plasma gruerateration. Prereq.: Electrical Engineering 706, Mechanical Engineering 741, Physics 705. 3 q.h.

INDUSTRIAL ENGINEERING

Associate Professor Sorokach (chairman); Assistant Professor Gonzales.

601. *Computers I.* Slide rule and desk calculator fundamentals. An introduction to digital computers and flow diagramming of elementary problems. Prereq.: Mathematics 654 and Physics 510. 2 q.h.

602. *Computers II.* Flow diagramming and problem layout. Fortran language will be employed to solve a wide variety of elementary engineering problems on the digital computer. Prerequisite or concurrent: Mathematics 656, Physics 603. 3 q.h.

701, 702. *Industrial Organization and Management I & II.* The general principles of industrial organization and management. Prerequisite or concurrent: Mathematics 742. 3 + 3 q.h.

703. *Systems Analysis.* Simulation of Industrial Engineering systems. Models of inventory, queueing, and material handling systems will be examined and simulated on the 360–40 digital computer. Elementary problems of production systems involving decisions under uncertainty will be investigated. Prereq.: Industrial Engineering 602, Mathematics 742. 3 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.: Industrial Engineering 702. 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.: Industrial Engineering 711. 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.: Industrial Engineering 702. 3 q.h.

801–802. *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. Economic lot size calculations. Prereq.: Industrial Engineering 701–702. 3 + 3 q.h.

822, 823. *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.: Industrial Engineering 702. 2 + 2 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.: Mathematics 653. 3 q.h.

831. *Linear Programming I.* Model formulation and the development of algorithms for the solution of linear type problems encountered in Industrial Engineering. The Simplex technique and various transportation algorithms including the Vogel approximation and stepping stone methods will be applied for the solution to the linear type models. Prereq.: Industrial Engineering 801 and Mathematics 725. 3 q.h.

832. *Linear Programming II.* An extension of Industrial Engineering 831 which will include the revised Simplex technique, duality in models, the product form of the inverse techniques to be used in the computer solution of linear models. Degeneracy procedures and cycling will be considered in the transportation and Simplex algorithms. Expansion type industrial applications will be considered. Prereq.: Industrial Engineering 831. 3 q.h.

833. *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 and replacement models will be considered. Monte Carlo techniques used in the simulation of the above models will be introduced. Prereq.: Industrial Engineering 802 and Industrial Engineering 823, plus Mathematics 742. 3 q.h.

841–842–843. *Industrial Engineering Thesis.* The student prepares a written report of at least 2500 words on an investigation of a subject selected by the student and agreed upon by the major adviser and the department chairman. Prereq.: 150 hours of degree credit completed. Conferences scheduled as required. 2 + 2 + 2 q.h.

MECHANICAL ENGINEERING

Professor D'Isa (chairman); Associate Professors Pejack, Petrek and Tarantine; Assistant Professors Arnett, Erzurum, Johnson and Lovas.

500. *Drawing Fundamentals.* Instruction in the use of drafting instruments, blue-print 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. 3 q.h.

501. *Engineering Drawing.* Orthographic projection, auxiliary and oblique views, developments, and detail and assembly drawings of machine parts. Prereq.: Mechanical Engineering 500 or equivalent. 3 q.h.

502. *Descriptive Geometry.* Exercises involving points, oblique lines and oblique planes

in space. Determination of distances, intersections and angles. The intersection of fundamental geometric shapes and development of their surface. Prereq.: Mechanical Engineering 501. 3 q.h.

600. *Thermodynamics I.* Thermodynamic properties of gases and vapors and their relationship in flow and non-flow first law energy transformations. Equations of state. Compression and expansion processes of gases and vapors. Entropy and the second law. Efficiencies. Prereq.: Physics 601, concurrent with Mathematics 673. 3 q.h.

601. *Thermodynamics II.* Entropy; Availability and Irreversibility; Thermodynamic Cycles; Relations among Thermodynamic Properties. Prereq.: Mechanical Engineering 600; concurrent with Mathematics 674. 3 q.h.

602. *Thermodynamics III.* Mixtures and Solutions; Psychrometry; Phase Equilibrium; Thermodynamics of Chemical Reactions. Prereq.: Mechanical Engineering 601. 3 q.h.

640. *Dynamics I.* The absolute and relative motion phases of kinematics of particles. Kinetics of particles using equations of motion and the work-energy and impulse-momentum methods. Vector notation is employed primarily for three-dimensional problems. Prerequisite or concurrent: Civil Engineering 611, Mathematics 709. 2 q.h.

680. *Seminar.* Orientation in Mechanical Engineering and the writing of engineering reports and thesis. Prereq.: 90 hours of degree credit completed. 1 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. Prereq.: Mechanical Engineering 600, Mathematics 711. 3 q.h.

741. *Dynamics II.* The same topic coverage as Dynamics I, but extended to rigid bodies and non-rigid systems of particles. Prereq.: Mechanical Engineering 640. 3 q.h.

742. *Dynamics of Machinery.* Application of analytical mechanics, with particular emphasis on machines. Prereq.: Mechanical Engineering 741. 3 q.h.

750. *Strength of Materials III.* Introduction to classical elasticity. Energy method of Castigliano. Theories of failure for metals. Use of electrical strain gages. Prereq.: Civil Engineering 615, Mathematics 711. 3 q.h.

790. *Thermodynamics V.* (Non-Mechanical Engineering Only). Cycle analysis and an introduction to fuels, combustion, and heat transfer by conduction, convection, and radiation. Prereq.: Mechanical Engineering 600. 3 q.h.

801–802–803. *Mechanical Engineering Thesis.* The student prepares a written report of at least 2500 words on an investigation of a subject selected by the student and agreed upon by the major adviser 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 the principles of Thermodynamics to power, refrigeration, and energy conversion devices. Prereq.: Mechanical Engineering 602. 4 q.h.

804L. *Thermodynamics IV Lab.* Experiments involving vapor power and refrigeration cycles. Analysis of fossil fuels. Taken concurrently with Mechanical Engineering 804. 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. Prereq.: Mechanical Engineering 720. 4 q.h.

821L. *Heat Transfer II Laboratory.* Thermocouple and optical pyrometer temperature measurements. Experiments in heat transfer by conduction, convection and radiation. Taken concurrently with Mechanical Engineering 821. 1 q.h.

822. *Internal Combustion Engines.* Thermodynamic analysis of internal combustion engine and gas turbine cycles; fuels, carburetion, and the effect of supercharging on internal combustion engine performance. Prereq.: Mechanical Engineering 602, Mathematics 711. 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.: Mechanical Engineering 602, Civil Engineering 718. 3 q.h.

824. *Principles of Nuclear Reactors.* Basic engineering science of the nuclear fission process applied to the generation of power. The course serves as background material for work in various phases of nuclear engineering; the chain reaction; vocabulary of nuclear reactions; multiplication, slow-down and diffusion of neutrons; shielding; kinetics; criticality; and theory of reactor control. Prereq.: Mechanical Engineering 602, Physics 612, Mathematics 711. 3 q.h.

824L. *Principles of Nuclear Reactors Laboratory.* Detection and measurement of radioactivity using Guger-Muller tubes. Scintillation

and gas flow detectors, and radiation analyzer. Isotope production using the reactor and decay of same. Flux distribution in the reactor. Taken concurrently with Mechanical Engineering 824. 1 q.h.

830. *Fluid Mechanics II.* 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.: Civil Engineering 718, Mathematics 711. 4 q.h.

830L. *Fluid Mechanics II Laboratory.* Experiments on compressible fluid flow in the subsonic and supersonic regions. Taken concurrently with Mechanical Engineering 830. Prereq.: Civil Engineering 718, Mathematics 711. 1 q.h.

851. *Strength of Materials IV.* Introduction to plasticity, creep, impact and fatigue of metals. Prereq.: Mechanical Engineering 750. 4 q.h.

851L. *Strength of Materials IV Laboratory.* Photoelasticity and brittle lacquers. Long-time creep, impact, and fatigue testing. Taken concurrently with Mechanical Engineering 851. 1 q.h.

860. *Machine Design I.* The design and use of machine elements such as shafts, keys, couplings, springs, screws, brakes, clutches, belts, and welded connections. Prereq.: Mechanical Engineering 742. 3 q.h.

860L. *Machine Design Laboratory.* Practical design problems, each incorporating the design of several machine elements. Taken concurrently with Mechanical Engineering 860. 1 q.h.

861. *Machine Design II.* A continuation of Machine Design I, including lubrication; ball and roller bearings; spur, bevel, worm and helical gears; and flywheels. Selected applications of Castigliano's Theorem. Prereq.: Mechanical Engineering 860 (Mechanical Engineering 860L). 3 q.h.

861L. *Machine Design II Lab.* 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 Mechanical Engineering 861. 1 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.: Civil Engineering 615, Mechanical Engineering 741, Mathematics 711. 4 q.h.

870L. *Mechanical Vibrations I Laboratory.* Experiments involving mechanical systems and some electrical analogies. Analog computer simulation of vibration systems is introduced. Taken concurrently with Mechanical Engineering 870. 1 q.h.

881. *Engineering Analysis I.* 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.: Mathematics 710. 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. (Not for Electrical Engineering majors.) Prereq.: Civil Engineering 718, Mathematics 711. 4 q.h.

DEPARTMENT OF METALLURGICAL ENGINEERING AND MATERIALS SCIENCE

Associate Professor Ahmed (chairman); Assistant Professors Jones and Filatovs.

601. *Introduction to Materials Science I.* Discussions of the basic electronic structure and properties of materials, theory of binding in solids including metals, alloys, semi-conductors, ceramic, and plastic materials, electrical and magnetic properties of materials crystallography. Prereq.: Chemistry 517. 3 q.h.

602. *Introduction to Materials Science II.* Discussions of the elastic and plastic properties of materials, ductile and brittle behavior of metals, plastic deformation, elementary ideas of dislocations and their basic properties, strain hardening. Prereq.: Metallurgical Engineering 601. 3 q.h.

603. *Introduction to Materials Science III.* Phase equilibria and phase diagram. Kinetics of phase changes, Industrial Metallurgy and Structural Materials; Prereq.: Metallurgical Engineering 602. 3 q.h.

614, 615. *Structure and Properties of Materials I & 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.: Metallurgical Engineering 603. 2 + 2 q.h.

620, 621. *Chemical Principles of Materials Science I, II.* Discussion of the application of physicochemical principles to metallurgical or materials problems. Prereq.: Chemistry 517. 3 + 3 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 or ores, casting of ingots, Non-ferrous production metallurgy, Mineral beneficiation smelting refining, and casting of non-ferrous metals. Prereq.: Chemistry 517. 3 + 3 + 3 q.h.

650. *Atomic and molecular structure of materials.* Discussions of the atomic structure and molecular structures of materials with particular emphasis on the energy levels and material properties. Prereq.: Chemistry 517, Mathematics 655, Physics 602. 3 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 Lab.) Prereq.: Metallurgical Engineering 632. 2 + 2 + 2 q.h.

740, 741. *Mechanical Working and Its Effect on Materials I, II.* 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. (1 hour lecture + 3 hours laboratory) Prereq.: Metallurgical Engineering 632. 2 + 2 q.h.

780. *Casting, Welding and Solidification.* General discussion of the engineering aspects of welding and solidification of ferrous and non-ferrous alloys. Prereq.: Metallurgical Engineering 615, 632. 3 q.h.

781. *Powder Metallurgy.* Scope of powder metallurgy, production of powders, sintering of powders, diffusion bonding, basic theories, application. Prereq.: Metallurgical Engineering 615, 632. 3 q.h.

782. *Phase Diagrams.* Discussions and interpretation of phase diagrams of multicomponent system. Prereq.: Metallurgical Engineering 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.: Metallurgical Engineering 632. 3 q.h.

784. *Crystalline Solids.* Discussion of crystallography Point Lattice and space lattices. Prereq.: Metallurgical Engineering 650. 3 q.h.

791, 792, 793. *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; theoretical treatment of nucleation and growth processes; diffusion. Prereq.: Metallurgical Engineering 621, 632, 650. 3 + 3 + 3 q.h.

791L, 792L, 793L. *Physical Metallurgy Laboratory I, II, III.* Laboratory experiments to illustrate the theories presented in Metallurgical Engineering 791, 792, 793. Experiments on resistivity, point defects, dislocations, recovery, recrystallization and grain growth, phase changes in solids. Determination of phase diagrams, etc. Prereq.: Metallurgical Engineering 791, 792, 793 or concurrent. 1 + 1 + 1 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 lab). Prereq.: Metallurgical Engineering 791. 3 + 3 q.h.

817. *Management of nuclear by-products.* Sources and characteristics of radioactive materials, Principles and determination of tolerance; standards and regulations; protection from side effects. Prereq.: Metallurgical Engineering 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.: Metallurgical Engineering 793. 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.: Metallurgical Engineering 793.

851. *Introduction to Polymer Science.* Discussions of Polymer materials with particular emphasis on their characteristics. Bonding mechanisms and composition. Prereq.: Metallurgical Engineering 793. 3 q.h.

852, 853, 854. *Advanced Engineering Materials (Non-Metallic) I, II, III.* Discussions on ceramic materials composites and cermets with special emphasis on atomic bonding; Structure of crystalline and non-crystalline solids; diffusion; grain growth Sintering and micro structure. Different types of glasses. Physical and mechanical properties; structure; volume and shear flow; glass-metal interface. Prereq.: Metallurgical Engineering 793.
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.: Metallurgical Engineering 793, 741 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.: Metallurgical Engineering 793. 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.: Metallurgical Engineering 861. 3 q.h.

863. *Thermodynamics of Materials I.* Principles of thermodynamics and its applications to materials metallurgical systems, processes and alloys. Prereq.: Metallurgical Engineering 793 and Mathematics 710. 3 q.h.

864. *Thermodynamics of Materials II.* Applications of thermodynamic principles to materials systems theory of alloys. Prereq.: Metallurgical Engineering 863. 3 q.h.

865. *Advanced Science of Materials.* Structure and properties of materials; theories of binding in solid-free electron theory, band theory, and zone theories, density of states; electrical and magnetic behaviors theory of alloys phases; structure of alloys. Prereq.: Metallurgical Engineering 793. 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.: Metallurgical Engineering 793. 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.: Metallurgical Engineering 793. 3 q.h.

890. *Metallurgy and Materials Colloquium.* Review of current Metallurgical and Materials research papers. Prereq.: Consent of advisor. 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.
3–4 q.h. each

Curriculum for the Degree of Bachelor of Engineering with the Major in Chemical Engineering

First Year

Fall	Hrs.
Math 571 Analytic Geometry and Calculus I	5
Chem. 515 General Chemistry	4
H. & P. E. 509 Health Education	3
Comm. 505 Basic Comm. I	3
Soc. Sci. 501 Introduction to Social Science I	3
	18

Winter	Hrs.
Math 572 Calculus II	4
Chem. 516 General Chemistry	4
Physics 510 Physics I	4
Comm. 506 Basic Comm. II	3
Soc. Sci 502 Introduction to Social Science II	3
	18

Spring	Hrs.
Math. 673 Calculus III	5
Chem. 517 General Chemistry	4
Physics 601 Physics II	3
Comm. 507 Basic Comm. III	3
Soc. Sci. 503 Introduction to Social Science III	3
	18

Second Year

Fall	Hrs.
Math. 674 Calculus IV	4
Chem. 719 Organic Chemistry	4
Physics 602 Physics III	3
Ch. E. 882 Principles of Ch. E. I	3
Ch. E. 680 Techniques	3
Comm. 508 Basic Comm. IV	3
	20

Winter	Hrs.
Math. 709 Ordinary Differential Equations	3
Chem. 720 Organic Chemistry	4
Physics 603 Physics IV	3

Ch. E. 683 Principles Ch. E. II	3
C. E. 610 Statics I	3
M. E. 501 Engineering Drawing	3
H. & P. E. Physical Activity	1
	20

Spring	Hrs.
Math. 710 Partial Differential Equations	3
Chem. 721 Organic Chemistry	4
Chem. 603 Quantitative Analysis	5
Ch. E. 684 Principles of Ch. E. III	3
C. E. 611 Statics II	2
M. E. 502 Descriptive Geometry	3
	20

Third Year

Fall	Hrs.
Ch. E. 784–784L Fluid Flow	4
Ch. E. 780 Thermo I	2
Chem. 739 Physical Chemistry	4
I. E. 602 Computers II	3
C. E. 614 Strength Materials I	3
Ch. E. Any 600 Elective	3
	19

Winter	Hrs.
Ch. E. 785–785L Heat Transfer	4
Ch. E. 781 Thermo II	2
Chem. 740 Physical Chemistry	4
Econ. 707 American Ideas	3
English Any 600-level course	3
Liberal Arts Elective	3
H. & P. E. Physical Activity	1
	20

Spring	Hrs.
Ch. E. 786–786L Unit Operations I	4
Ch. E. 782 Thermo III	2
Chem. 741 Physical Chemistry	4
Phil. Philosophy	4
Elective (liberal arts)	3
H. & P. E. Physical Activity	1
	18

Fourth Year

Fall	Hrs.
Ch. E. 880 Kinetics	3
Ch. E. 801 Thesis I	2
Ch. E. Elective	3
Ch. E. 787–787L Unit Operations II	4
E. E. 713–713L Electrical Engineering	4
H. & P. E. Physical Activity	1
	17

Winter	Hrs.
Ch. E. 881 Kinetics II	2
Ch. E. 802 Thesis II	2
Ch. E. 885 Plant & Process Design	3
Ch. E. 788–788L Unit Operations III	4
E. E. 715–715L Electrical Devices	4
H. & P. E. Physical Activity	1
	16

Spring	Hrs.
Ch. E. 882 Process Dynamics	4
Ch. E. 803 Thesis III	2
Ch. E. 886 Plant & Process Design	3
Elective (liberal arts)	3
Technical Elective (out of dept.)	3
H. & P. E. Physical Activity	1
	16

ELECTIVES

Liberal Arts: Chosen from courses in Art, history, music, literature, language,* Humanities and philosophy for which the student has prerequisites.

Election of courses not listed requires Department Head or Curriculum Committee approval.

TECHNICAL

In Department	Hrs.
Ch. E. 685 Corrosion	3
Ch. E. 686 Waste Control	3
Ch. E. 783 Engineering Plastics	3
Ch. E. 883 Mathematical Methods	3

Out of Department	Hrs.
Mt. E. 630 Principles of Extractive Metallurgy	3
Math. 760 Numerical Analysis	3
Math. 740 Statistics	3

Curriculum for the Degree of Bachelor of Engineering with the Major in Civil Engineering

First Year

Fall	Hrs.
Math. 571 Analytic Geometry and Calculus I	5
Chem. 515 General Chemistry	4
Comm. 505 Basic Course I	3
Soc. Sci. 501 Introduction to Social Science	3
H. & P. E. activity course	1
	16

Winter	Hrs.
Math. 572 Analytic Geometry and Calculus II	4
Chem. 516 General Chemistry	4
Physics 510 General Physics I	3
Comm. 506 Basic Course II	3
Soc. Sci. 502 Introduction to Social Science	3
H. & P. E. activity course	1
	18

Spring	Hrs.
Math. 673 Calculus III	5
Chem. 517 General Chemistry	4
Phys. 601 General Physics II	3
Comm. 507 Basic Course III	3

* No less than 9 hours of language permitted. Student must obtain Curriculum Committee approval for a curriculum adjustment.

Soc. Sci. 503 Introduction to Social Science	3
H. & P. E. activity course	1
	19

Second Year

Fall	Hrs.
Math. 674 Analytic Geometry and Calculus IV	4
Phys. 602 General Physics III	3
Comm. 508 Basic Course IV	3
Ch. E. 610 Statics I	3
M. E. 600 Thermodynamics I	3
M. E. 501 Engineering Drawing	3
H. & P. E. activity course	1
	20

Winter	Hrs.
Math. 709 Diff. Equations	3
Phys. 603 General Physics IV	3
M. E. 790 Thermodynamics V	3
C. E. 611 Statics II	2
English: any 600-level course	3
I. E. 602 Computer II	3
H. & P. E. activity course	1
	18

Spring	Hrs.
Math. 710 Diff. Equations	3
M. E. 502 Descriptive Geometry	3
C. E. 614 Strength of Materials I	3
M. E. 640 Dynamics I	2
English: any 600-level course	3
H. & P. E. activity course	1
History: any 600-level course	3
	18

Third Year

Fall	Hrs.
Math. 711 Higher Math. for Engineers I.	3
C. E. 615 Strength of Materials II	2
C. E. 615L Strength of Materials II Laboratory	1
M. E. 741 Dynamics II	3
E. E. 713 Electrical Engineering	3
E. E. 713L Electrical Engineering Laboratory	1
C. E. 720 Surveying I	3
C. E. 720L Surveying I Laboratory	1
Econ. 707 Economics of American Industry	3
	20

Winter	Hrs.
E. E. 715 Electron Devices and Controls.	3
E. E. 715L Electron Devices and Controls Laboratory	1
C. E. 740 Structural Analysis I	3
C. E. 718 Fluid Mechanics I	3
C. E. 718L Fluid Mechanics I Lab.	1
Philosophy and Religious Studies elective.	4
H. & P. E. Health Education	3
	18

Spring	Hrs.
M. E. 750 Strength of Materials III	3
C. E. 741 Structures II Analysis	3
C. E. 719 Hydraulic Engineering	3
C. E. 724 Transportation I	2
C. E. 724L Transportation I Laboratory.	1
Mt. E. 601 Engineering Materials I	3
C. E. 721 Surveying II	3
C. E. 721L Surveying II Laboratory	1
	19

Fourth Year

Fall	Hrs.
C. E. 840 Structures III Analysis	3
C. E. 824 Transportation II	3
C. E. 831 Environmental Engineering I.	3
C. E. 860 Thesis	2
Elective (liberal arts)	3
Elective (liberal arts)	3
	17

Winter	Hrs.
C. E. 825 Transportation III	2
C. E. 825L Transportation III Lab.	1
C. E. 841 Structure Design I	3
C. E. 832 Environmental Engrg. II.	2
C. E. 832L Environmental Engineering II Laboratory	1
C. E. 861 Thesis	2
C. E. 850 Soil Mechanics	3
C. E. 850L Soil Mechanics Laboratory	1
Elective (technical)	3
	18

Spring	Hrs.
C. E. 851 Foundation Engineering	3
C. E. 842 Structure Design II	3
C. E. 862 Thesis	2
Electives (technical)	6
Elective (liberal arts)	3
	17

Technical Electives	Hrs.
C. E. 820 Surveying III	3
C. E. 820L Laboratory	1
C. E. 826 Transportation IV	3
C. E. 830 Hydrology	3
C. E. 833 Environmental Engineering III.	3
C. E. 843 Systems Engr. I	3
C. E. 844 Systems Engr. II	3
C. E. 845 Civil Engr. Analysis	3
C. E. 846 Adv. Structr. Analysis	3
C. E. 847 Struct. Dyn.	3
C. E. 848 Plates and Shells	3
C. E. 852 Adv. Soil Mech.	3
Mt. E. 602 Engr. Mat'ls. II	3
M. E. 851 Strength IV	4
M. E. 870 Mechanical Vibrations	4
M. E. 830 Fluid Mech. II	4
Physics 704	3
Physics 705	3
Math. 740 Statistics I	3
Math. 741 Statistics II	3
Math. 742 Statistics III	3
Geology 501 and 502 Physical	6
Business Org. 701, Bus. Law	3
Business Org. 702, Bus. Law	3
I. E. 703 Computer III	3

Liberal Arts: Chosen from courses in art, history, music, literature, language, Humanities and philosophy for which the student has prerequisites.

Curriculum for the Degree of Bachelor of Engineering with the Major in Electrical Engineering

First Year

Fall	Hrs.
Chem. 515 General Chemistry	4
Math. 571 Analytic Geometry and Calculus I	5
Comm. 505 Basic Course I	3
Soc. Sci. 501 Introduction to Social Science	3
H. & P. E. activity course	1
H. & P. E. 509 Health Education	3
	19

Winter	Hrs.
Chem. 516 General Chemistry	4
Math. 572 Analytic Geometry and Calculus II	4
Comm. 506 Basic Course II	3
Soc. Sci. 502 Introduction to Social Science	3
Phys. 510 General Physics I	4
H. & P. E. activity course	1
	19

Spring	Hrs.
Chem. 517 General Chemistry	4
Math. 673 Analytic Geometry and Calculus III	5
Comm. 507 Basic Course III	3
Soc. Sci. 503 Introduction to Social Science III	3
Phys. 601 General Physics II	3
H. & P. E. activity course	1
	19

Second Year

Fall	Hrs.
M. E. 501 Engineering Drawing	3
Phys. 602 General Physics III	3
Math. 674 Analytic Geometry and Calculus IV	4
E. E. 601 Circuit Theory I	3
C. E. 610 Statics I	3
H. & P. E. activity course	1
	17

Winter	Hrs.
M. E. 502 Descriptive Geometry	3
Physics 603 General Physics IV	3
Math. 709 Ordinary Differential Equations	3
E. E. 602 Circuit Theory II	3
C. E. 611 Statics II	2
E. E. 612 Electrical Laboratory I	1
Comm. 508 Basic Course IV	3
H. & P. E. activity course	1
	19

Spring	Hrs.
I. E. 602 Computers II	3
Math. 710 Higher Mathematics for Engineers I	3
E. E. 603 Circuit Theory III	3
E. E. 613 Electrical Laboratory II	1
M. E. 640 Dynamics I	2
English: Any 600-level course	3
H. & P. E. activity course	1
	16

Third Year

Fall	Hrs.
Math. 711 Higher Mathematics for Engineers II	3
E. E. 704 Field Theory I	3
E. E. 701 Circuit Theory IV	3
E. E. 711 Electrical Laboratory III	1
E. E. 707 Physical Electronics I	3
M. E. 741 Dynamics II	3
English Any 600-level course	3
	19

Winter	Hrs.
Math 711 Higher Mathematics for Engineers II	3
E. E. 705 Field Theory II	3
E. E. 702 Circuit Theory V	3
E. E. 712 Electrical Laboratory IV	1
E. E. 708 Electronic Circuit Theory II	3
Phys. 704 Modern Physics I	3
Econ. 707 Economics of American Industry	3
	19

Spring	Hrs.
E. E. 706 Transmission and Radiation	3
E. E. 703 Control Analysis I	3
E. E. 716 Electrical Laboratory V	1
E. E. 709 Electronic Circuit Theory III	3
Phys. 705 Modern Physics II	3
Mt. E. 601 Engineering Materials I	3
Elective (liberal arts)	3
	19

Fourth Year

Fall	Hrs.
E. E. 809 Electrical Energy Conversion I	3
E. E. 805 Quantum Electronics	3
M. E. 600 Thermodynamics I	3
E. E. 717 Electrical Laboratory VI	1
E. E. 801 Thesis	2
Elective (liberal arts)	3
Mt. E. 602 Engineering Materials II	3
	18

Winter	Hrs.
E. E. 810 Electrical Energy Conversion II	3
M. E. 790 Thermodynamics V	3
E. E. 718 Electrical Laboratory VII	1
C. E. 614 Strength of Materials I	3
E. E. 802 Thesis	2
Elective (technical)	3
Elective (liberal arts)	3
	18

Spring	Hrs.
E. E. 811 Electrical Energy Conversion III	3
E. E. 804 Electrical Laboratory VIII	1
Philosophy and Religion elective	4
Elective (technical)	6
E. E. 803 Thesis	2
	16

Curriculum for the Degree of Bachelor of Engineering with the Major in Industrial Engineering

First Year

Fall	Hrs.
Math. 571 Analytic Geometry and Calculus I	5
Chem. 515 General Chemistry	4
Comm. 505 Basic Course I	3
Soc. Sci. 501 Introduction to Social Science I	3
H. & P. E. activity course	1
	16

Winter	Hrs.
Math. 572 Analytic Geometry and Calculus II	4
Chem. 516 General Chemistry	4
Comm. 506 Basic Course II	3
Soc. Sci. 502 Introduction to Social Science II	3
Phys. 510 General Physics I	4
H. & P. E. activity course	1
	19

Spring	Hrs.
Math. 673 Analytic Geometry and Calculus III	5
Chem. 517 General Chemistry	4
Comm. 507 Basic Course III	3
Soc. Sci. 503 Introduction to Social Science III	3
Phys. 601 General Physics II	3
H. & P. E. activity course	1
	19

Second Year

Fall	Hrs.
Math. 674 Analytic Geometry and Calculus IV	4
Comm. 508 Basic Course IV	3
C. E. 610 Statics I	3
Phys. 602 General Physics III	3
M. E. 501 Engineering Drawing	3
I. E. 601 Computers I	2
H. & P. E. activity course	1
	19

Winter	Hrs.
H. & P. E. 509 Health	3
Phys. 603 General Physics IV	3
C. E. 611 Statics II	2
M. E. 502 Descriptive Geometry	3
I. E. 602 Computers II	3
History: Any 600-level course	3
H. & P. E. activity course	1
	18

Spring	Hrs.
English: Any 600-level course	3
M. E. 600 Thermodynamics I	3
Math. 725 Matrix Theory and Linear Algebra	4
M. E. 640 Dynamics I	2
Acctg. 601 Elem. Accounting	3
Met. Eng. 601 Engr. Materials	3
H. & P. E. activity course	1
	19

Third Year

Fall	Hrs.
Math. 740 Mathematical Statistics I	3
Math. 709 Ordinary Differential Equations	3
I. E. 701 Industrial Organization and Management I	3
M. E. 790 Thermodynamics V	3
Elective (liberal arts)	3
M. E. 741 Dynamics II	3
	18

Winter	Hrs.
I. E. 711 Methods I	3
Math. 710 Higher Mathematics for Engineers I	3
Math. 741 Mathematical Statistics II	3
I. E. 702 Industrial Organization and Management II	3
C. E. 614 Strength of Materials I	3
English: Any 600-level course	3
	18

Spring	Hrs.
C. E. 615 Strength of Mats. II	2
C. E. 615L Strength of Mats. II Laboratory	1
I. E. 712 Methods II	3
Math. 742 Mathematical Statistics III	3
Econ. 707 Economics Amer. Ind.	3
I. E. 703 Computers III	3
Technical Elective	4
	19

Fourth Year

Fall	Hrs.
E. E. 713 Electrical Engr.	3
E. E. 713L Electrical Engr. Laboratory	1
I. E. 841 Thesis	2
I. E. 822 Quality Control I	2
I. E. 831 Operations Research	3
I. E. 721 Job Analysis & Eval.	3
Econ. 801 Labor Problems	3
	17

Winter	Hrs.
I. E. 801 Production Planning and Control I	3
I. E. 823 Quality Control II	2
I. E. 832 Operations Research II	3
E. E. 714 Electron Devices and Controls	3
E. E. 714L Electron Devices and Controls Laboratory	1
Acctg. 719 Managerial Accounting	3
I. E. 842 Thesis	2
	17

Spring	Hrs.
I. E. 833 Operations Research III	3
Philosophy, Religion elective	4
E. E. 715 Electrical Devices	3
E. E. 715L Electrical Devices Laboratory	1

Elective (technical)	3
I. E. 843 Thesis	2
I. E. 802 Production Planning II	3
	19

ELECTIVES

Liberal Arts: Chosen from courses in art, history, music, literature, language,* Humanities and philosophy for which the student has prerequisites.

TECHNICAL

	Hrs.
E. E. 703 Control I and Lab	4
Phys. 705 Modern Physics	3
Math. 760 Numer. Analysis	3
Math. 711 Higher Math. II	3
Math. 875 Complex Variables	3
M. E. 742 Dynamics of Mach.	3
M. E. 750 Str. Mat'l III and Lab	4
M. E. 870 Vibrations and Laboratory	4
M. E. 881 Engineering Analysis I	3
I. E. 824 Engineering Eco.	3

Any 700 level engineering course for which the student has the prerequisites may be taken with the advisor's approval.

Curriculum for the Degree of Bachelor of Engineering with the Major in Mechanical Engineering

First Year

Fall	Hrs.
Math. 571 Calculus I	5
Chem. 515 General Chemistry	4
Comm. 505 Basic Course I	3
Soc. Sci. 501 Introduction to Social Science I	3
H. & P. E. activity course	1
	16

Winter	Hrs.
Math. 572 Calculus II	4
Chem. 516 General Chemistry	4
Phys. 510 General Physics I	4
Comm. 506 Basic Course II	3
Soc. Sci. 502 Introduction to Social Science II	3
H. & P. E. activity course	1
	19

Spring	Hrs.
Math. 673 Calculus III	5
Chem. 517 General Chemistry	4
Phys. 601 General Physics II	3
Comm. 507 Basic Course III	3
Soc. Sci. 503 Introduction to Social Science III	3
H. & P. E. activity course	1
	19

* No less than 9 hours of language permitted. Student must obtain Curriculum Committee approval for a curriculum adjustment.

Second Year

Fall	Hrs.
Math. 674 Calculus IV	4
Phys. 602 General Physics III	3
M. E. 600 Thermodynamics I	3
C. E. 610 Statics I	3
Comm. 508 Basic Course IV	3
H. & P. E. 509 Health Education	3
H. & P. E. activity course	1
	20

Winter	Hrs.
Math. 709 Ordinary Differential Equations	3
Phys. 603 General Physics IV	3
M. E. 601 Thermodynamics II	3
C. E. 611 Statics II	2
English: Any 600-level course	3
M. E. 501 Engineering Drawing	3
H. & P. E. activity course	1
	18

Spring	Hrs.
Math. 710 Higher Mathematics for Engineers I	3
M. E. 680 Seminar	1
M. E. 602 Thermodynamics III	3
M. E. 640 Dynamics I	2
English: Any 600-level course	3
M. E. 502 Descriptive Geometry	3
I. E. 602 Computers II	3
H. & P. E. activity course	1
	19

Third Year

Fall	Hrs.
History: Any 600-level course	3
Math. 711 Higher Mathematics for Engineers II	3
E. E. 713 Electrical Engineering	3
E. E. 713L Electrical Engineering Laboratory	1
M. E. 741 Dynamics II	3
Phys. 704 Modern Physics I	3
Mt. E. 601 Material Science I	3
	19

Winter	Hrs.
E. E. 714 Electron Devices and Controls	3
E. E. 714L Electron Devices and Controls Laboratory	1
C. E. 614 Strength of Materials I	3
Econ. 707 Economics of American Industry	3
Mt. E. 602 Material Science II	3
Phys. 705 Modern Physics II	3
Elective (liberal arts)	3
	19

Spring	Hrs.
M. E. 720 Heat Transfer I	3
E. E. 715 Electrical Devices	3
E. E. 715L Electrical Devices Laboratory	1
C. E. 718 Fluid Mechanics I	3
C. E. 718L Fluid Mechanics I Laboratory	1
C. E. 615 Strength of Materials II	2
C. E. 615L Strength of Materials II Laboratory	1
M. E. 742 Dynamics of Machinery	3
	17

Fourth Year

Fall	Hrs.
M. E. 801 Thesis	2
M. E. 750 Strength of Materials III	3
Phil. & Religious Studies Elective	4
M. E. Electives	8 or 9
	17 or 18

Winter	Hrs.
M. E. 802 Thesis	2
M. E. 860 Machine Design I	3
M. E. 860L Machine Design I Laboratory	1
M. E. Electives	10 or 11
	16 or 17

Spring	Hrs.
M. E. 803 Thesis	2
Elective (technical-out of department)	3 or 4
M. E. Electives	11 or 12
	16 to 18

Departmental Electives	Hrs.
804 Applied Thermodynamics	4
804L Thermodynamics Lab	1
821 Heat Transfer II	4
821L Heat Transfer Lab	1
822 Internal Combustion Engines	3
823 Refrigeration and Air Conditioning	3
824 Principles of Nuclear Reactors	3
824L Nuclear Reactors Lab	1
830 Fluid Mechanics II	4
830L Fluid Mechanics Lab	1
851 Strength of Materials IV	4
851L Strength of Materials Lab	1
861 Machine Design II	3
861L Machine Design Lab	1
870 Mechanical Vibrations	4
870L Mechanical Vibrations Lab	1
881 Engineering Analysis I	4
892 Control Theory	4

Curriculum for the Degree of Bachelor of Engineering with Major in Metallurgical Engineering or Material Science

The department offers three options:

a. Metallurgical Engineering
b. Material Science
c. Nuclear Metallurgy

First Year

Fall	Hrs.
Math. 571 Calculus I	5
Chem. 515 General Chemistry	4
Comm. 505 Basic Course I	3
H. & P. E. 509 Health	3
	15

Winter	Hrs.
Math. 572 Calculus II	4
Chem. 516 General Chemistry II	4
Comm. 506 Basic Course II	3
M. E. 501 Engineering Drawing	3
History: Any 600-level course	3
H. & P. E. activity course	1
	18

Spring	Hrs.
Math. 673 Calculus III	5
Chem. 517 General Chemistry III	4
Phys. 510 General Physics	4
Comm. 507 Basic Course III	3
M. E. 502 Descriptive Geometry	3
H. & P. E. 500-level	1
	20

Second Year

Fall	Hrs.
Met. Engr. 601 Fund. of Material Science I	3
Met. Engr. 630 Prin. of Extrac. Met. I	3
Math. 674 Calculus IV	4
Phys. 601 General Physics II	3
Comm. 508 Basic Course IV	3
Soc. Sci. 501 Social Science I	3
H. & P. E. activity course	1
	20

Winter	Hrs.
Met. Engr. 602 Fund. of Material Science II	3
Met. Engr. 631 Prin. of Extrac. Met. II	3
Met. Engr. 650 Atomic Structure of Material	3
Phys. 602 General Physics III	3
C. E. 610 Statics I	3
Soc. Sci. 502 Social Science II	3
H. & P. E. activity course	1
	19

Spring	Hrs.
Met. Engr. 603 Fund. of Material Science III	3
Met. Engr. 632 Prin. of Extrac. Met. III	3
Math. 709 Diff. Equations	3
Phys. 603 General Physics IV	3
C. E. 611 Statics II	2
Soc. Sci. 503 Social Science III	3
H. & P. E. activity course	1
	18

Third Year

Fall	Hrs.
Met. Engr. 620 Chem. Prin. in Material Science I	3
Met. Engr. 791 Physical Met. I	3
Met. Engr. 791L Physical Met. Lab. I	1
Met. Engr. 614 Struc. and Prop. of Material I	2
Math. 710 Higher Math. I	3
C. E. 614 Strength I	3
E. E. 713 Elec. Engineering	3
E. E. 713L Elec. Engineering	1
H. & P. E. activity course	1
	20

Winter	Hrs.
Met. Engr. 621 Chem. Prin. in Materials II	3
Met. Engr. 615 Struc. and Prop. Materials II	2
Met. Engr. 792 Physical Met. II	3
Met. Engr. 792L Physical Met. Lab. II	1
Math. 711 Higher Math II	3
Elective (technical)	4
Phil. or Religious Studies 600-level	4
	20

Spring	Hrs.
Met. Engr. 793 Physical Met. III	3
Met. Engr. 793L Physical Met. Lab. III	1
Met. Engr. 740 Mech. Working I	2
E. E. 715 Elec. Devices	3
E. E. 715L Elec. Devices Lab.	1
Economics 707 Economics of Am. Indus.	3
Elective (Met. Engr.—General)	3
Elective (Technical)	4
	20

Fourth Year

Fall	Hrs.
Met. Engr. 860 Mech. Behavior or Material	3
Met. Engr. 730 Metallography I	2
Met. Engr. 741 Mech. Working II	2
Mech. Engr. 640 Dynamics I	2
Elective (Met. Engr. Gen.)	3
English: Any 600-level	3
Met. Engr. 891 Thesis	3
	18

Winter	Hrs.
Met. Engr. 861 Applied X-rays I	3
Met. Engr. 731 Metallography II	2
Met. Engr. 840 Modern Research Tech.	1
Elective (Met. Engr. Option)	3
Elective (Met. Engr. Option)	3
Elective (Liberal Arts)	3
Met. Engr. 892 Thesis II	3
	18

Spring	Hrs.
3rd quarter	
Met. Engr. 863 Therm of Solids I	3
Met. Engr. 732 Metallography III	2
Elective (Met. Engr. Option)	3
Met. Engr. 890 Met. and Material Collo.	1
Elective (Technical)	3
Met. Engr. 893 Thesis	3
	15

ELECTIVES

I. **Technical** (out of department)

The student must choose 11 hours of technical electives from the following courses. Election of courses, not listed, requires department head's approval.

Chem. Eng. 685, 783
E. E. 714, 714L
M. E. 881, 882
I. E. 602, 701, 702, 703
Math. 725, 740, 741, 742, 760
Chem. 621, 622, 623
Phys. 704, 826, 810, 811
Geol. 503, 504

II. **General** (in department)

The student may choose 6 or more hours from the courses listed below.

Met. Engr. 784 Crystalline Solids	3
Met. Engr. 862 Applied X-Rays II	3

Met. Engr. 864 Thermodynamics of Solids II 3
Met. Engr. 865 Advanced Science of Material 3
Met. Engr. 866 Special Topics 3

III. Met. Engr. Options

The student must choose at least 9 hours in one of the following options:

OPTION A: Metallurgical Engineering

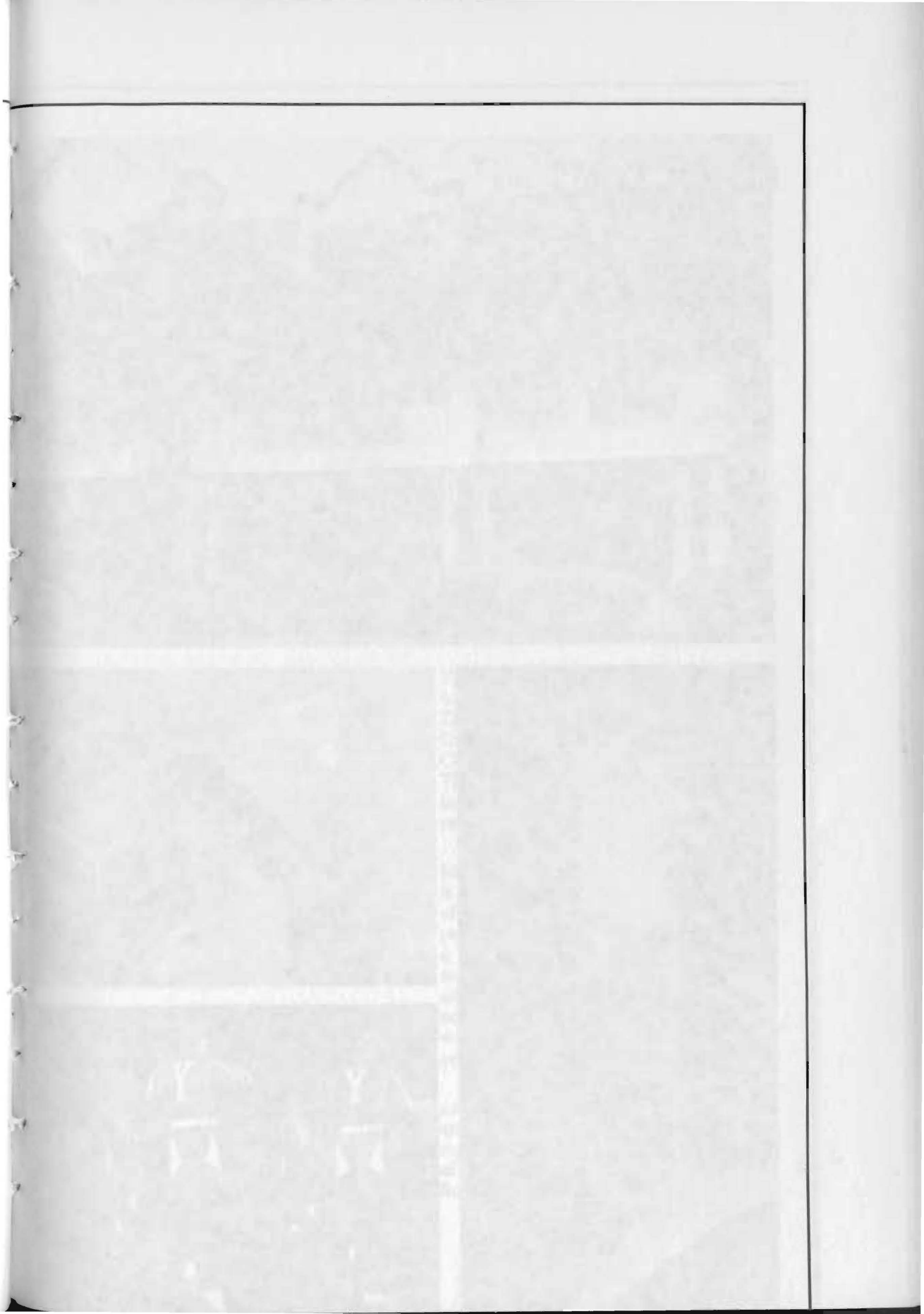
Met. Engr. 780 Casting, Welding, Solidification 3
Met. Engr. 781 Powder Metallurgy 3
Met. Engr. 783 Ferrous and Non-ferrous Alloys 3
Met. Engr. 870 Theory of Alloys 3
Met. Engr. 871 Physical Metallurgy IV .. 3
Met. Engr. 872 Refractory Metals and Alloys 3

OPTION B: Materials Science

Met. Engr. 782 Phase Diagrams 3
Met. Engr. 851 Intro to Poly. Sci. 3
Met. Engr. 852 Adv. Engr. Mat'l I 3
Met. Engr. 853 Adv. Engr. Mat'l II 3
Met. Engr. 854 Adv. Engr. Mat'l III 3

OPTION C: Nuclear Metallurgy

Met. Engr. 815 Particle Interaction I 3
Met. Engr. 816 Particle Interaction II.... 3
Met. Engr. 817 Management of Nuc By-Product 1
Met. Engr. 830 Intro. to Nuc. Mat'ls I ... 3
Met. Engr. 831 Intro. to Nuc. Mat'ls II .. 3
Met. Engr. 835 Intro. to Nuc. Mat'ls III . 3




THE DANA SCHOOL OF MUSIC
OF YOUNGSTOWN COLLEGE

The Dana School of Music

Charles Henry Aurand, Dean

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 former Charles S. Thomas mansion, a block north of the main campus, became its home and remains its principal building.

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.

school of music

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 the 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, sacred music, or music education. It also provides the courses for the major in the history and literature of music for the degree of Bachelor of Arts.

With the co-operation 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, at 616 Wick Avenue, contains the administrative offices, thirteen 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 twenty soundproof practice rooms and a pipe organ practice room. In the second story of Central Hall, on the main campus, are two studios, a soundproof rehearsal and recital hall seating 300, and instrumental and choral libraries. 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.

EQUIPMENT

Equipment includes twenty grand pianos, twenty-seven uprights, a Sperrhake harpsichord, four practice organs, and band and orchestra instruments. The 4-manual Moeller organ of the Trinity Methodist Church is available for teaching and for practice by students preparing for their senior recitals.

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 for 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 Dean of the Dana School of Music. For other scholarships, see *Scholarships and Loans* in the General Information section.

PLACEMENT SERVICE

Through its many alumni, the school can give its graduates considerable assistance in finding professional positions. Its con-

tacts 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 Philharmonic Orchestra with the *Dana Artists' 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. In addition, the faculty presents a series of programs for the general public.

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 *Dana Chorus* is an all-school group whose primary purpose is to acquaint music students and the general public with the great masterworks of choral literature. The group presents a concert each semester, in which a major work is performed. Students who are not members of the Dana School of Music are also invited to apply for membership.

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 a group of selected students from the school of music. The group studies and sings *a cappella* compositions of the English madrigal school, modern arrangements of folk tunes, and suitable contemporary works.

The *University Chorus* is an all-campus choral group open to those students of the University who enjoy singing the wide variety of music arranged for mixed voices.

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 and is open to all who can qualify. For the *Concert Band,* which presents programs of various types of band music, members are selected through auditions.

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 is open to all students in the University who can qualify.

The *String Quartet,* the *String Ensemble,* and the *Brass, Woodwind,* and *Percussion Ensembles* are generally restricted to students of the school of music.

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, the opera chorus, or the opera orchestra.

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 other Youngstown State University activities as described under *Student Activities,* in the General Information section. The Student Chapter of the Music Educators National Association and the Youngstown Chapter of Composers, Authors and Artists of America are also open to University students.

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.

TUITION AND FEES

See *Tuition* in the General Requirements and Regulations section.

APPLICATION AND 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). His application for admission to the school of music should be submitted to the dean of the school (from whose office application forms are obtainable) by August 1 for the fall quarter, December 2 for the winter quarter, or February 24 for the spring quarter.

Every freshman takes a placement examination to determine his proficiency in applied music and general musicianship. These examinations are usually given one week before the opening of a quarter. Dates are announced.

The entering student must give considerable thought to the branch of applied music in which he will specialize, as a change of curriculum later on is likely to delay his graduation.

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 student wishing to specialize in music theory or in composition, or to prepare for advanced study after graduation from the University, should present evidence of his ability to handle the materials of music.

ADMISSION FROM OTHER INSTITUTIONS

The general policy is stated in the General Requirements and Regulations section. Advanced standing in applied music and in aural and written theory is granted tentatively and must be validated by examinations.

SPECIAL STUDENTS

The general policy is stated in the General Requirements and Regulations section. Accordingly, the school of music provides training for mature students who wish to improve their playing ability or to study music for cultural purposes, but who cannot enter the degree courses. Private lessons on all instruments and in voice are available to such students.

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. The pre-college or preparatory study, of two kinds:

   a. Academic. The specified courses are listed below. For further information, see the General Requirements and Regulations section. These courses are normally taken in high school. Those lacking must be made up before the junior year in the University.

   b. Musical. As explained above, 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; they are explained in the General Requirements and Regulations section but are recapitulated below.

   a. Curricula. Most curricula leading to this degree require from 208 to 212 quarter hours of credit and are designed to be completed in four academic years. A student may finish any curriculum in less than the usual time if he can carry heavier loads successfully.* A student planning to take summer courses should consult his adviser.

   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.

PRE-COLLEGE ACADEMIC

SUBJECT	HIGH SCHOOL UNITS
English	3
United States history and civics	1
Mathematics	1
Science	1
Others**	10

MUSICAL

Proficiency adequate for undertaking college-level music courses.

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

** French, German, or Italian will be most advantageous for the student intending to major in voice. See **Proficiency in a Foreign Language**, in the College of Arts and Sciences section.

IN THE UNIVERSITY
REQUIREMENTS IN ADDITION TO COURSES

Upper division status (including completion of any specified preparatory courses lacking at time of entrance).

Major and minor requirements

For details, see the complete year-by-year curricula at the end of this section. A grade of C or lower may indicate a need for retention on a certain proficiency level. This will be determined by the student's proficiency in his major instrument examination.

Course-level requirements.

Point index requirements.

Residence requirement.

Application for graduation.

COURSE REQUIREMENTS
(OTHER THAN THE MAJOR AND MINOR)

	QUARTER HOURS OF CREDIT
BASIC COURSES	
Communication 505–506–507–508 Basic Course I, II, III, IV	12
Health and Physical Education 509M or 509W Health Education	3
Health and Physical Education activity courses	6
AREA COURSES	
Social studies:	
Social Science 501–502–503 Introduction to the Social Sciences I, II, III	9
History 601 and 602 The United States (except for the sacred music major, who takes History 605 and 606, History of Western Civilization)	9
Religion:	
A course in the Philosophy and Religious Studies department, or in Humanities	4
Science:	
Physics 608 Sound, and a science elective	9
NON-PROFESSIONAL COURSE	
Psychology 601 General Psychology	4
PROFESSIONAL COURSES	
Music 510–511–512 Theory I	12
Music 610–611–612 Theory II	12
Music 717–718 Vocal and Instrumental Conducting and Ensemble, Advanced Conducting 719 or 720	9
Music 780–781–782 History of Music	9
Music 753 Counterpoint I	3
Music ensembles	15
Recital	1

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, composition, or sacred music, and also a major in music education should consult the Dean of the Dana School of Music.

COURSES OF INSTRUCTION AND CURRICULUMS†

FACULTY

Professors Aurand and Walker; Associate Professors Alleman, Byo, Connor, Gould, L. M. Hopkins, R. E. Hopkins, Sample, Spiro and Vogel, Assistant Professors Conable, Kagarice, Lavin, Pellegrini,

Raridon, Rosenberg and Wisler; Instructors Badal, Larson, Mayhall, Rullman.

APPLIED MUSIC

Students desiring credit must enroll for not less than one quarter.

The student not qualifying for applied music 504 or 507 (whichever his curriculum requires) takes the relevant course 500 until his deficiency is overcome.

The student who can meet the applied music proficiency requirements of his curriculum without taking the courses designed to develop that proficiency may earn in other applied music courses as many quarter hours as he would in the courses not taken.

Advanced standing in applied music is granted tentatively after a placement examination given by members of the faculty. Final classification is made at the end of the first quarter of residence study.

In most cases instruction is in one half-hour weekly lesson a credit, except where class instruction is given.

A student may transfer from a minor course to a major course if he has the approval of the faculty concerned. He is then assigned an appropriate major course number on the basis of his proficiency and repertory.

Proficiency examinations in applied music are given at the end of each quarter. Promotion to the next applied course depends upon quality of performance and quantity of repertory.

No credit will be given in an applied music course if the student misses more than three half-hour lessons in a one-hour course, six half-hour lessons in a two-hour course, or nine half-hour lessons in a three-hour course. In case of prolonged illness, the lessons may be made up at the discretion of the teacher.

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

A student's choice of teacher will be respected as far as possible, but final assignment rests with the Dean of the School of Music.

RECITALS

Students are required to perform in a departmental or all-student recital once each quarter after their freshman year, and to give a recital when they are seniors.

HONORS RECITALS: Two programs per year are set aside for outstanding student performances.

CONCERTO RECITAL: An annual recital featuring outstanding student performers of concerti and/or arias with orchestral accompaniment.

899. *Senior Recital.* A thirty-to-sixty minute public performance of senior-level literature. Prereq.: completion of junior-level major instrument proficiency. 1 q.h.

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 Concert Band for each quarter of the four years. (Wind majors who are accepted by audition for orchestra may meet their ensemble requirements by participating in orchestra.) * All instrumental majors are required to take one year of a choral ensemble; voice majors must participate in a major choral ensemble * for each quarter of the four years and in a second major ensemble (choral or instrumental) for one year; piano, organ, and sacred music majors are required to sing in one of the major choral ensembles for four years. (In exceptional cases, ensemble participation may be waived by the Dean of the School of Music.)

There is no tuition charge for full-time students for any ensemble course. 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 satisfac-

* The Dean 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 Dana Chorus and Concert Choir.

tory 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.

Dana Chorus. Open to any student in the University who can qualify. 1 q.h.

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 Singers. Open to any student who can qualify. 1 q.h.

Concert Band. Open to any student in the University who can qualify. 1 q.h. each quarter

Marching Band. Open to any University student who can qualify. Functions only during the football season. Six hours a week. Three hours of Marching Band credit may be applied toward the health and physical education activity requirement. ½ 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 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. each quarter

Percussion Ensemble. Limited to students of the school of music. 1 q.h. each quarter

String Ensemble. Open to any University student who can qualify. 1 q.h. each quarter

Woodwind Ensemble. Limited to students of the school of music. 1 q.h. each quarter

Brass Ensemble. Limited to students of the school of music. 1 q.h. each quarter

String Quartet. Limited to selected students of the school of music. 1 q.h. each quarter

Accompanying. Open to advanced piano and organ students of the school of music. 1 q.h. each quarter

Stage Band Workshop. A laboratory experience in twentieth century band techniques. Emphasis is on analysis of harmonic progressions, form, and performance requirements of this musical idiom. n.c.

PIANO

500. For those who do not qualify for Piano 504 or 507. This course may be repeated. 1 q.h.

Major Courses

507–508–509. All major and minor scales and tonic, dominant seventh and diminished seventh arpeggios, hands together, four octaves. Bach, *Three-Part Inventions;* less difficult sonatas of Mozart or Haydn; romantic and contemporary compositions. 3 + 3 + 3 q.h.

607–608–609. Scales in thirds, sixths, and tenths. Bach, *French Suites, Well-Tempered Clavier;* sonatas of Mozart, Haydn, early Beethoven, or Schubert; romantic and contemporary compositions. 3 + 3 + 3 q.h.

707–708–709. Continuation of scale and arpeggio study. Bach, *English Suites, Well-Tempered Clavier;* Beethoven sonatas; Mozart, Haydn, or early Beethoven concertos; less difficult etudes of Chopin; romantic and modern compositions. 3 + 3 + 3 q.h.

807–808–809. Scales in double thirds and octaves. Bach, *Partitas, Toccatas, Well-Tempered Clavier;* Beethoven sonatas; romantic concertos; larger works of Chopin; romantic and contemporary compositions. Senior recital. 3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See Piano 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See Piano 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See Piano 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See Piano 807–808–809. 2 + 2 + 2 q.h.

Minor Courses

All students not majoring in piano must complete a four-hour piano minor. At the end of this period, and upon recommendation of their piano teacher, they will be examined in the following skills:

(1) the ability to sight-read four-part songs;

(2) the ability to harmonize at sight, improvising a simple piano accompaniment for songs requiring the use of I, IV, V chords and some simple modulations; and to transpose the

songs and harmonizations to other keys; and

(3) the ability to sight-read fairly fluently simple accompaniments, vocal or instrumental, and simple piano compositions of the type used for school rhythmic activities.

501–502–503. Elements of keyboard technique, with emphasis on developing fluency in sight-reading. Easiest compositions of Bach; Bartok, *Mikrokosmos,* vol. 1. All major and minor scales and tonic chords and arpeggios, hands separately. 1 + 1 + 1 q.h.

601–602–603. All major and minor scales and tonic, dominant seventh and diminished seventh arpeggios, hands separately, three octaves. Bach, selections from *Notenbuechlein* or *Clavier-Buechlein;* Mozart, earliest pieces. Beethoven, sonatinas. Romantic and contemporary compositions. 1 + 1 + 1 q.h.

701–702–703. Scales and arpeggios as above, hands together. Bach, *Little Preludes,* selected suite movements. Haydn, *Divertimenti.* Clementi, sonatinas. Romantic and contemporary compositions. 1 + 1 + 1 q.h.

801–802–803. Scales and arpeggios as above, in faster tempo. Bach, *Two-Part Inventions.* Mozart, *Sonata facile.* Beethoven, easier sets of variations. Romantic and contemporary compositions. 1 + 1 + 1 q.h.

HARPSICHORD

501–502–503. Instruction in basic technique, with discussion of construction, literature, ornamentation, and performance practices. Prereq.: consent of teacher. 1 + 1 + 1 q.h.

601–602–603. Elizabethan dances and variations; Kuhnau, *Biblical Sonatas;* Bach, *French Suites.* Prereq.: Harpsichord 503. 1 + 1 + 1 q.h.

701–702–703. Bull, fantasias and variations; Couperin, selected pieces; Bach, *Well-Tempered Clavier.* Prereq.: Harpsichord 603. 1 + 1 + 1 q.h.

801–802–803. Bach, *English Suites, Italian Concerto.* Scarlatti, sonatas. Contemporary works. Continuo playing. Prereq.: Harpsichord 703. 1 + 1 + 1 q.h.

ORGAN

500. Intended for those who do not qualify for Organ 504 or 507. The course may be repeated. 1 q.h.

Major Courses

507–508–509. Studies and compositions from methods such as Gleason Method of Organ Playing, or Flor Peeters *Ars Organi.* Seventy-nine *Chorale Preludes,* Bach-Dupré, Chorale Preludes from *Das Orgelbuechlein,* Eight Little Preludes and Fugues; Romantic and contemporary compositions. 3 + 3 + 3 q.h.

607–608–609. Continuation of studies and development of technique as needed. Bach: *Fantasy and Fugue in C Minor; Fugue in G Minor; First Sonata; Prelude in F Minor;* chorale preludes, Mendelssohn: Second Sonata. Pieces from Historical Series (Vol. I, ed. Bonnet). Modern compositions by American, French, English, or German composers. 3 + 3 + 3 q.h.

707–708–709. Bach: chorale preludes; *Prelude and Fugue in E Minor* (Wedge); *Prelude and Fugue in A Minor; Second Sonata; Toccata and Fugue in D Minor* and *Toccata in D Minor* (Dorian); *Prelude and Fugue in G Major.* Franck: *Cantabile; Prelude, Fugue, and Variation; Pastorale; Piece Héroique.* Mendelssohn: *Third Sonata.* Modern compositions. 3 + 3 + 3 q.h.

807–808–809. Bach: *Third Sonata;* chorale preludes; *Fantasy and Fugue in G Minor; Toccata, Adagio, and Fugue in C Major; Prelude and Fugue in E-Flat* ("St. Anne's"); *Passacaglia and Fugue in C Minor; Prelude and Fugue in B Minor.* Franck: *Chorale in A Minor.* Mendelssohn: *First Sonata, Sixth Sonata.* Vierne: selected movements from the six symphonies. Widor: *Sixth Symphony.* Sowerby: *Suite, Symphony in G Minor.* Roger-Ducasse: *Pastorale.* Bennett: *Sonata in G;* shorter compositions suitable for recitals. Concerto for organ and orchestra. Senior recital. 3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See Organ 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See Organ 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See Organ 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See Organ 807–808–809. 2 + 2 + 2 q.h.

Minor Courses

501–502–503. See Piano 501–502–503. 1 + 1 + 1 q.h.

601–602–603. See Piano 601–602–603. 1 + 1 + 1 q.h.

701–702–703. See Piano 701–702–703. 1 + 1 + 1 q.h.

VOICE

500. For those who do not qualify for Voice 504 or 507. The course may be repeated. 1 q.h.

Major Courses

507–508–509. Concentration is upon 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. 3 + 3 + 3 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 be able properly to sing a number of songs, both in English and in foreign languages. One or two arias, each 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. 3 + 3 + 3 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 and oratorio arias will be required. 3 + 3 + 3 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 at least four operatic arias, four oratorio arias, twenty classic and twenty 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. 3 + 3 + 3 q.h.

Major Courses for Music Education

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.

504–505–506. See Voice 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See Voice 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See Voice 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See Voice 807–808–809. 2 + 2 + 2 q.h

Minor Courses

501–502–503. Concentration is upon producing a pleasing and musical vocal tone. In addition to exercises chosen on the basis of students' needs, they will be expected to learn a limited number of songs. Amount of repertoire decided by Voice Faculty. Open to students with no previous training. 1 + 1 + 1 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. 1 + 1 + 1 q.h.

701–702–703. Advanced vocal technique and literature. For those who can qualify. Prereq.: Voice 601–602–603. 1 + 1 + 1 q.h.

801–802–803. Advanced vocal technique and literature. For those who can qualify. Prereq.: Voice 701–702–703. 1 + 1 + 1 q.h.

VIOLIN

500. For those who do not qualify for Violin 504 or 507. The course may be repeated. 1 q.h.

Major Courses

507–508–509. Kreutzer, *Studies,* to No. 32. Concertos by Vivaldi, Nardini, Rode, deBeriot. Sonatas by Corelli, Veracini, Leclair. Technical material including Sevcik, Op. 8 and 9, Schradiek, Casorti. Not fewer than six short compositions suitable for recital repertoire. Major and minor scales and arpeggios in three octaves, using fundamental strokes. 3 + 3 + 3 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. 3 + 3 + 3 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; Schradiek, Book II. 3 + 3 + 3 q.h.

807–808–809. Advanced studies from Wieniawski; Dont, Op. 35; Gavinies and Paganini concertos. Wieniawski, Saint-Saens, Mendelssohn, Lalo, Beethoven, etc. Completion of repertoire requirement; senior recital. 3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See Violin 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See Violin 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See Violin 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See Violin 807–808–809. 2 + 2 + 2 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. 1 + 1 + 1 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. Not fewer than six compositions by Seitz and Rieding. 1 + 1 + 1 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. 1 + 1 + 1 q.h.

801–802–803. Continued study of positions. Maia Bang, Book V. Studies by Mazas and Dont: beginning of Kreutzer. *Allegro Brillante* by Tenhave, concerto by Hollander, sonatas by Handel. Scales in three octaves. 1 + 1 + 1 q.h.

VIOLA

500. For those who do not qualify for Viola 504 or 507. The course may be repeated. 1 q.h.

Major Courses

507–508–509. Studies by Mazas, Kreutzer, Sitt, Schradiek technic. Sonatas by Handel; repertoire material: not fewer than six pieces. Scales and arpeggios in three octaves. 3 + 3 + 3 q.h.

607–608–609. Studies by Kreutzer and Fiorillo. Sonatas by Vivaldi and Marcello. Scales and arpeggios continued. Six recital pieces. 3 + 3 + 3 q.h.

707–708–709. Studies by Rode, Campagnoli, and Bruni. Concertos by Stamitz and Mozart. Scales in double stops. Six recital pieces. 3 + 3 + 3 q.h.

807–808–809. Studies by Gavinies and Dolesji; sonatas by Bowen, Bach, and others. Scales and arpeggios continued. Senior recital. 3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See Viola 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See Viola 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See Viola 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See Viola 807–808–809. 2 + 2 + 2 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. 1 + 1 + 1 q.h.

601–602–603. Development of left hand facility. Beginning of lower positions. Studies by Kayser. Scales in positions. Pieces in positions. 1 + 1 + 1 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. 1 + 1 + 1 q.h.

801–802–803. Higher positions. Mazas, Kreutzer. Pieces by Nardini, Sitt, and others. Scales in three octaves. 1 + 1 + 1 q.h.

CELLO

500. Intended for those who do not qualify for Cello 504 or 507. This course may be repeated. 1 q.h.

Major Courses

507–508–509. 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.* 3 + 3 + 3 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.* 3 + 3 + 3 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 concerti by Boccherini and Lalo. 3 + 3 + 3 q.h.

807–808–809. All 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. 3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See Cello 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See Cello 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See Cello 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See Cello 807–808–809. 2 + 2 + 2 q.h.

Minor Courses

501–502–503. Kummer, *Method,* and Schroeder, *Studies.* Scales and solos in first position. 1 + 1 + 1 q.h.

601–602–603. Schroeder, *Studies.* Scales. Klengel, *Concertino in C Major;* Marcello, *Sonata in F Major.* 1 + 1 + 1 q.h.

701–702–703. Schroeder, *Studies.* Scales. Loeillet, *Sonata in G Major;* Goltermann. *Concerto No. 4.* 1 + 1 + 1 q.h.

801–802–803. Continued on a more advanced level. For those who can qualify. 1 + 1 + 1 q.h.

STRING BASS

500. For those who do not qualify for String Bass 504 or 507. The course may be repeated. 1 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.* 3 + 3 + 3 q.h.

607–608–609. Hrabe, *Studies.* Repertoire, such as Cappuzzi, *Concerto;* sonatas by Galliard and Loeillet; Ratez, *Six Characteristic Pieces,* Op. 46. 3 + 3 + 3 q.h.

707–708–709. Billé, *Method,* Part II, Books 4 and 5. Concert pieces to include sonatas by Eccles, Antoniotti, and D'Andrieu. 3 + 3 + 3 q.h.

807–808–809. Kreutzer, *Studies.* Reynolds, *Orchestra Studies;* Strauss, *Orchestra Studies.* Solos to include Koussevitzky concerto or Dragonetti concerto. Senior recital. 3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See String Bass 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See String Bass 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See String Bass 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See String Bass 807–808–809. 2 + 2 + 2 q.h.

Minor Courses

501–502–503. Simandl, *Method,* Part I. Scales. 1 + 1 + 1 q.h.

601–602–603. Simandl, *Method,* Part II. Bach, *Minuet and Gavotte;* Vivaldi, *Intermezzo.* 1 + 1 + 1 q.h.

701–702–703. Simandl, *30 Etudes.* Anderson, *Sonatina.* 1 + 1 + 1 q.h.

801–802–803. For those who can qualify. 1 + 1 + 1 q.h.

FLUTE

500. To be elected by students who do not qualify for Flute 504 or 507. The course may be repeated. 1 q.h.

Major Courses

507–508–509. All major scales, 2 octaves with required articulations. All minor scales 2 octaves, with articulations. All Handel sonatas; any two of Quantz, Blavet and Telemann. Andersen studies Op. 41, and 33. Berbiquier 18 Studies, or works of comparable level. 3 + 3 + 3 q.h.

607–608–609. All scales by thirds. All scales by fourths. All Bach Sonatas including A minor for Flute alone, Bach *Suite in B Minor* for Flute and Strings; Telemann *Suite in A Minor* for Flute. Anderson Studies Opus 21 and 30; Hugues 40 Studies Opus 75; Mozart *Concerto in D* and *G;* or works of comparable level. 3 + 3 + 3 q.h.

707–708–709. Hindemith *Sonata;* Piston *Sonata;* Schubert *Variations Opus 160;* Orchestra studies. Andersen *Studies Opus 63.* Andersen Studies Opus 15. Poulenc *Sonata.* Griffes *Poem.* 3 + 3 + 3 q.h.

807–808–809. Andersen *Studies* Opus 60. Dutilleux *Sonatine Messian Le Merle Noir; Jean-Jean Etudes.* Selected contemporary music. Orchestra Studies. Debussy Trio for Flute, Viola and Harp. Or works of comparable level. 3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See Flute 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See Flute 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See Flute 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See Flute 807–808–809. 2 + 2 + 2 q.h.

Minor Courses

501–502–503. Altes, *Method,* Book I; Moyse. *The Beginning Flutist;* Loeillet solos. 1 + 1 + 1 q.h.

601–602–603. Altes, *Method,* Book II; Boehm, *24 Caprice Etudes;* Mozart-Barrere, *Minuette in D Major;* Bach, *Polonaise* and *Badinage* from *B Minor Suite.* 1 + 1 + 1 q.h.

701–702–703. Studies and solos of the level indicated for Flute 507–508. 1 + 1 + 1 q.h.

801–802–803. Studies and solos of the level indicated for Flute 607–608. 1 + 1 + 1 q.h.

CLARINET

500. To be elected by those who do not qualify for Clarinet 507. The course may be repeated. 1 q.h.

Major Courses

507–508–509. Studies and solos such as Klose, *Method,* Book II; Rose, *40 Etudes,* Books I and II; Langenus, *Method,* Book III; Von Weber, *Concertino* and *Concerto in F Minor;* Jean-Jean, *Clair Matin;* Mozart, *Concerto.* 3 + 3 + 3 q.h.

607–608–609. Studies and solos such as Rose, *32 Etudes;* Baermann, *Method,* Book IV; Perier, *Etudes de Genres et Interprétation,* Book I; Marty, *First Fantasy;* Lefevre, *Fantaisie Caprice;* Hahn, *Sarabande et Themes Varies.* 3 + 3 + 3 q.h.

707–708–709. Studies and solos such as Rose, *20 Grand Studies;* Baermann, *Method,* Book V; Cavalini, *30 Caprices;* Perier, *20 Sonata Studies;* orchestral studies; Rabaud, *Solo de Concours;* Gaubert, *Fantaisie;* Stravinsky, *Three Pieces;* Schumann, *Phantasiestuecke.* 3 + 3 + 3 q.h.

807–808–809. Studies and solos such as Stark *24 Grand Studies;* Jean-Jean, *18 Etudes;* Jeanjean, *16 Modern Etudes;* orchestral studies; Widor, *Introduction and Ronde;* Debussy, *Premiere Rhapsodie;* Brahms, sonatas; Milhaud, *Concerto.* Senior recital. 3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See Clarinet 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See Clarinet 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See Clarinet 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See Clarinet 807–808–809. 2 + 2 + 2 q.h.

Minor Courses

501–502–503. Klose, *Method,* Book I; Perier, *Le Débutant Clarinettiste, 20 Etudes Melodiques et Faciles;* Gretchaninoff, *Suite Miniature;* Petit, *Piece de Concours.* 1 + 1 + 1 q.h.

601–602–603. Perier, *20 Etudes Faciles et Progressives;* Rose, *40 Etudes,* Book I; Langenus, *Scale Studies;* Debussy, *First Arabesque for Clarinet;* Avon, *Fantaisie de Concours.* 1 + 1 + 1 q.h.

701–702–703. Studies and solos of the level indicated for Clarinet 507–508. 1 + 1 + 1 q.h.

801–802–803. Studies and solos of the level indicated for Clarinet 607–608. 1 + 1 + 1 q.h.

OBOE

500. For those who do not qualify for Oboe 504 or 507. This course may be repeated. 1 q.h.

Major Courses

507–508–509. Studies and solos such as Ferling, *48 Etudes;* Sellner, *Etudes for Oboe,* Book II; Handel, *Concerto in G Minor;* Labate, *Villanella;* Schumann, *Three Romances* for Oboe. 3 + 3 + 3 q.h.

607–608–609. Studies and solos such as Labate, *16 Exercises;* Capelle, *20 Grand Etudes,* Book I; Cimarosa, *Concerto;* Nielson, *Romance;* Foret, *Sonata in G Major;* Ropartz, *Pastorale and Dance.* 3 + 3 + 3 q.h.

707–708–709. Studies and solos such as Andraud, *Vade-Mecum* (etudes and orchestral studies); Bleuzet, *The Technique of the Oboe,* Book II; Loyon, *32 Modern Etudes;* Saint-Saens, *Sonata;* Hindemith, *Sonata;* Palidilhe, *Concertante.* Work on English horn begun. 3 + 3 + 3 q.h.

807–808–809. Continued study of English horn. Studies and solos such as Andraud, *Vade-Mecum;* Gillet, *Advanced Studies,* Jean-Jean, *Remembrances;* Rivier, *Improvisation and Fi-*

nale; Dallier, *Fantaisie Caprice;* Piston, *Suite.* Senior recital. 3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See Oboe 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See Oboe 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See Oboe 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See Oboe 807–808–809. 2 + 2 + 2 q.h.

Minor Courses

501–502–503. Studies and solos such as Andraud, *Method* (1949); Niemann-Labate, *Oboe Method;* Bakaleinikoff, *Elegy;* Templeton, *Siciliana;* J. Wagner, *Three Pastorales.* 1 + 1 + 1 q.h.

601–602–603. Studies and solos such as Gekeler, *Method,* Book II; Verroust, *24 Etudes,* Op. 65. Books I, II; Pares, *Daily Technical Studies;* Klemcke, *Pastorale;* Handel, *Sonata in C Minor;* Gliere, *Chanson;* Bach-Gillet, *Three Little Pieces.* 1 + 1 + 1 q.h.

701–702–703. Studies and solos of the level indicated for Oboe 507–508–509. 1 + 1 + 1 q.h.

801–802–803. Studies and solos of the level indicated for Oboe 607–608–609. 1 + 1 + 1 q.h.

BASSOON

500. For those who do not qualify for Bassoon 504 or 507. The course may be repeated. 1 q.h.

Major Courses

507–508–509. Studies and solos such as Weissenborn, *Duets;* Oubradous. *Enseignement Complete du Basson,* Book I; Jancourt, *Reverie;* Foret, *Three Pieces;* Mozart, *First Concerto.* 3 + 3 + 3 q.h.

607–608–609. Studies and solos such as Milde, Book II; Oubradous, *Enseignement Complete du Basson,* Book II; orchestral studies; Hindemith, *Sonata;* Handel, *Concerto in C Minor;* Jean-Jean, *Capriccioso.* 3 + 3 + 3 q.h.

707–708–709. Studies and solos such as Bozza, *Daily Studies;* Oubradous, *Enseignement Complete du Basson,* Book III; orchestral studies; Saint-Saens, *Sonata;* Grovlez, *Sicilienne* and *Allegro Giocoso;* Jancourt, *Cantilene;* Bruns, *Concerto.* 3 + 3 + 3 q.h.

807–808–809. Studies and solos such as Giampieri, *Daily Studies;* Orefice, *Bravura Studies;* orchestral studies; Pierné, *Prelude de Concert;* Bozza, *Concerto,* Op. 49; Bozza, *Fantaisie;* Jean-Jean, *Prelude and Scherzo.* Senior recital. 3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See Bassoon 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See Bassoon 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See Bassoon 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See Bassoon 807–808–809. 2 + 2 + 2 q.h.

Minor Courses

501–502–503. Studies and solos such as Weissenborn. Op. 8 Book 1; Jancourt, *Studies,* Book 1; Isaak, *Jolly Dutchman;* Ziesi, *Souvenir.* 1 + 1 + 1 q.h.

601–602–603. Studies and solos such as Weissenborn, Op. 8, Books I and II; Jancourt, *Studies,* Books I and II; Bakaleinikoff, *Ballad;* Weissenborn, *Capriccio.* 1 + 1 + 1 q.h.

701–702–703. Studies and solos of the level indicated for Bassoon 507–508–509. 1 + 1 + 1 q.h.

801–802–803. Studies and solos of the level indicated for Bassoon 607–608–609. 1 + 1 + 1 q.h.

TRUMPET

500. To be elected by those who do not qualify for Trumpet 504 or 507. This course may be repeated. 1 q.h.

Major Courses

507–508–509. The development of a daily practice routine suitable to the individual, for the purpose of acquiring a correct and lasting command of fundamental skills such as tone production, embouchure, breath control, flexibility, and legato and staccato articulations, using Arban's *Method* for cornet, *Etudes* by Hering, *Daily Drills and Studies* by Schlossberg. Major and minor scales and chords, introduction to transposition, sight reading, and the study of cantabile solos such as the *Lieder* of Schubert, Brahms, Schumann, and other solos. 3 + 3 + 3 q.h.

607–608–609. Concentration upon basic techniques; slurs, scales, chords, intervals, and single, double, and triple articulations in major and minor keys, using Arbans method; Schloss-

berg *Daily Drills and Studies;* Clarke *Studies;* Sachse *Transposition Studies; Orchestral Studies from the Symphonic Repertoire.* Cantabile solos and other solos. 3 + 3 + 3 q.h.

707–708–709. Continuation of technical studies: Arbans method; Schlossberg *Studies;* Paudert *Studies;* Brandt *Orchestral Studies;* Petit *Studies;* Sachse *Transposition Studies; Orchestral Studies from the Symphonic Repertoire.* Sight-reading. Solos by Fitzgerald, Vidal, Barat, Goeyens, Deboeck, Busser, and others. 3 + 3 + 3 q.h.

807–808–809. Advanced studies by Clarke, Peitzsch, Laurent, Petit, Charlier; Sachse *Transposition Studies; Orchestral Studies from the Symphonic Repertoire.* Sight reading. Solos. Concertos by Haydn, Vidal, Williams, Brandt, Delacroix. Sonatas by Hindemith and Tuthill. Senior recital. 3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See Trumpet 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See Trumpet 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See Trumpet 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See Trumpet 807–808–809. 2 + 2 + 2 q.h.

Minor Courses

501–502–503. Introduction to problems of brass instrument playing, stressing formation of embouchure, attack and release, breath control, tone quality, flexibility, legato and staccato articulation. Elementary exercises showing these skills in the Edwards-Hovey *Method,* Arban's *Method,* or equivalent studies. Introduction to scales. Selected cantabile solos. Open to students without previous training. 1 + 1 + 1 q.h.

601–602–603. Continued stress on fundamentals of grade I with extension of range. Scale studies to include all major and minor keys. Selected cantabile solos. Material stressing these skills in World's *Method for Cornet,* Hering's *Studies,* or equivalent. 1 + 1 + 1 q.h.

701–702–703. Extension of range, using scale studies in major and minor keys and broken chords. Flexibility studies as in Schlossberg's *Daily Drills.* Additional progress in World's *Method for Cornet,* Hering's *Studies,* or equivalent studies. Selected cantabile solos. 1 + 1 + 1 q.h.

801–802–803. Continued on a more advanced level. For those who can qualify. 1 + 1 + 1 q.h.

FRENCH HORN

500. For those who do not qualify for French Horn 504 and 507. The course may be repeated. 1 q.h.

Major Courses

507–508–509. Development of the fundamental skills, such as tone production, embouchure, breath control, and legato and staccato articulations, using Franz, Kopprasch, Alphonse, Michiels. Major and minor scales and chords; transposition, sight reading. Cantabile solos, and other solos of grade III difficulty. 3 + 3 + 3 q.h.

607–608–609. Studies by Franz, Kopprasch, Alphonse, Pottag. Slurs, scales, chords, intervals, legato and staccato articulations in major and minor keys. Transposition and sight reading. Cantabile solos, and other grade III and IV solos. 3 + 3 + 3 q.h.

707–708–709. Continuation of technical studies, using Alphonse, Pottag, Gallay. Transposition and sight reading. Solos of grade IV difficulty. 3 + 3 + 3 q.h.

807–808–809. Advanced studies, including studies by Pottag, Gallay, Alphonse. Transposition and sight reading. Grade V and VI solos. Senior recital. 3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See French Horn 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See French Horn 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See French Horn 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See French Horn 807–808–809. 2 + 2 + 2 q.h.

Minor Courses

501–502–503. Special studies for development of embouchure, breath control, articulation, flexibility, tone control. Pottag-Hovey, *Method for French Horn;* Horner, *Primary Studies.* Introduction to scales. Selected cantabile solos. 1 + 1 + 1 q.h.

601–602–603. Horner, *Studies.* Continued stress upon fundamentals of grade I. Scale studies in major and minor keys. Extension of range. Selected cantabile solos. 1 + 1 + 1 q.h.

701–702–703. Studies and solos of the level indicated for French Horn 507–508–509. 1 + 1 + 1 q.h.

801–802–803. Continued on a more advanced level. For those who can qualify. 1 + 1 + 1 q.h.

TROMBONE

500. For those who do not qualify for Trombone 504 or 507. This course may be repeated. 1 q.h.

Major Courses

507–508–509. 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; introduction to tenor clef; sight reading; study materials by Rochut, Blume, Mueller, and Ostrander. Cantabile solos by Barat, Telemann, David, Henry Smith Solo Collection and other solos of grade III and IV difficulty. 3 + 3 + 3 q.h.

607–608–609. Continuation of technical studies. All major and minor scales with any articulation in eighth notes. Introduction to alto clef; sight reading; Solos of grade III and IV difficulty including solos by Sanders, McKay, Handel, and Marcello. 3 + 3 + 3 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. Introduction to orchestral excerpts using collections by Brown, Stoneberg, Bertold, and Menken. Solos of grade IV and V difficulty including solos by Rimsky-Korsakov, Jacob, Boda, Stojowski, and Bozza. 3 + 3 + 3 q.h.

807–808–809. Advanced studies by Rochut, Kahila, Blazhevich and Lafosse. Continuation of orchestral excerpts. Solos by J. S. Bach, K. P. E. Bach, Hindemith, Serocki, Hartley, White, and other solos of grade V and VI difficulty. Senior recital. 3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See Trombone 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See Trombone 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See Trombone 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See Trombone 807–808–809. 2 + 2 + 2 q.h.

Minor Courses

501–502–503. Studies to develop embouchure, attack, release, breath control, tone quality, flexibility, knowledge of positions. Studies by Cimera, Hovey, Endressen. Selected cantabile solos. 1 + 1 + 1 q.h.

601–602–603. Continuation of development of skills stressed in 500 level courses. Scale studies, stressing legato and staccato articulation. Extension of range. Studies by Mueller, Cimera, Arban. Study of cantabile solos for development of legato-cantabile style. 1 + 1 + 1 q.h.

701–702–703. Studies and solos of the level indicated for Trombone 507–508–509. 1 + 1 + 1 q.h.

801–802–803. Continued on a more advanced level. For those who can qualify. 1 + 1 + 1 q.h.

TUBA

500. For those who do not qualify for Tuba 504 or 507. This course may be repeated. 1 q.h.

Major Courses

507–508–509. 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 Hejda; Sight reading; Cantabile solos of grade III difficulty including Wekselblatt Collection, works by Purcell, Beethoven, and Bach. 3 + 3 + 3 q.h.

607–608–609. Studies by Kopprasch, Arban, Rochut, and Vasiliev. All major and minor scales in eighth notes; sight reading; solos of grade III and IV difficulty including works by Lebedev, Marcello, Hartley, Bach, Frackenpohl, and others. 3 + 3 + 3 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, Vaughan Williams, and horn solos by Strauss and Mozart. 3 + 3 + 3 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. 3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See Tuba 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See Tuba 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See Tuba 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See Tuba 807–808–809. 2 + 2 + 2 q.h.

BARITONE HORN

500. For those who do not qualify for Baritone Horn 504 or 507. This course may be repeated. 1 q.h.

Major Courses

507–508–509. 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. 3 + 3 + 3 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. 3 + 3 + 3 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. 3 + 3 + 3 q.h.

807–808–809. Advanced studies by Rochut, Kahila, Blazhevich, and Lafosse. Emphasis on band and orchestral excerpts. Solos of grade V and VI difficulty including works by Bach, Handel, Serocki, Hartley, Beasley, and White. 3 + 3 + 3 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. 1 + 1 + 1 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. 1 + 1 + 1 q.h.

701–702–703. Studies and solos of the level indicated for Tuba 507–508–509. 1 + 1 + 1 q.h.

801–802–803. Continued on a more advanced level. For those who can qualify. 1 + 1 + 1 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See Baritone Horn 507–508–509. 2 + 2 + 2 q.h.

604–605–606. See Baritone Horn 607–608–609. 2 + 2 + 2 q.h.

704–705–706. See Baritone Horn 707–708–709. 2 + 2 + 2 q.h.

804–805–806. See Baritone Horn 807–808–809. 2 + 2 + 2 q.h.

Minor Courses

501–502–503. Studies to develop embouchure, attack, release, breath control, tone quality, flexibility, knowledge of positions. Studies by Cimera, Hovey, Endressen. Selected cantabile solos. 1 + 1 + 1 q.h.

601–602–603. Continuation of development of skills stresed 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. 1 + 1 + 1 q.h.

701–702–703. Studies and solos of the level indicated for Baritone 507–508–509. 1 + 1 + 1 q.h.

801–802–803. Continued on a more advanced level. For those who can qualify. 1 + 1 + 1 q.h.

PERCUSSION

500. To be elected by those who do not qualify for Percussion 504 or 507. The course may be repeated. 1 q.h.

Major Courses

507–508–509. 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: melleting, roll, scales, arpeggios. Peterson, *Rubank Elementary Method;* graded violin, saxophone, and clarinet exercises. 3 + 3 + 3 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.
3 + 3 + 3 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. 3 + 3 + 3 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.
3 + 3 + 3 q.h.

Major Courses for Music Education

The following courses differ only in degree from those listed above. A high standard of proficiency is insisted upon, and a recital is required.

504–505–506. See Percussion 507–508–509.
2 + 2 + 2 q.h.

604–605–606. See Percussion 607–608–609.
2 + 2 + 2 q.h.

704–705–706. See Percussion 707–708–709.
2 + 2 + 2 q.h.

804–805–806. See Percussion 807–808–809.
2 + 2 + 2 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, Books I and II. Gardner, *Progressive Studies,* Book I.
1 + 1 + 1 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.
1 + 1 + 1 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.
1 + 1 + 1 q.h.

801–802–803. Continued on a more advanced level. For those who can qualify.
1 + 1 + 1 q.h.

THEORY AND COMPOSITION

510–511–512. *Theory I.* A unified course of study consisting of ear-training, sight-singing, and keyboard and written harmony, using simple chord construction. Formal and harmonic analysis of simple compositions. Meets five hours a week. 4 + 4 + 4 q.h.

610–611–612. *Theory II.* The study of more complex chord construction, modulations, and analysis of compositions in smaller forms. Ear-training, sight-singing, keyboard harmony correlated with theory training. Meets five hours a week. Prereq.: Music 503–504–505 with grade of C or better. 4 + 4 + 4 q.h.

513–514–515. *Composition A.*

613–614–615. *Composition B.*

713–714–715. *Composition C.*

813–814–815. *Composition D.*

Organized on a progressive basis, beginning with exercises in the creative use of the materials of music leading directly into free composition for a variety of media.

Extensive analysis of the music of recognized masters. By the end of the fourth year, the student will have composed songs; works for solo instruments, singly and in combination; choral music; and a large-scale composition, such as a string quartet or a sonata for piano alone or with another instrument. Selections from the student's works performed in a recital of at least an hour's duration. Prerequisite or concurrent: Music 503–504–505, 603–604–605.
3 q.h. each

651–652. *Elementary Sight-Singing and Ear-Training.* A course designed to provide additional work in sight-singing and ear-training for students who want to improve their ability to recognize intervals, chords, melodic and rhythmic patterns and harmonic progressions. Class meets four hours a week 3 + 3 q.h.

751. *Analytical Techniques.* Analysis of representative repertoire from the Renaissance, Baroque, Classical, Romantic and Contemporary periods. 3 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.

807. *Orchestration.* A study of the instruments of the modern orchestra, their tone color individually and in combination. Writing and arranging for them singly, in groups, and in full score. Prereq.: Music 612. 3 q.h.

808. *Band Arranging.* Same as Music 807 except that this course is concerned with the symphonic band. 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 751. 2 + 2 + 2 q.h.

830. *Modern Harmony.* A study of harmonic trends in modern music, including polytonality, atonality, and other techniques. Prereq.: senior standing, with major in music. 3 q.h.

851–852–853. *Advanced Sight-Singing and Ear-Training.* Advanced training of student's sense of pitch, rhythm, and tonal memory. Harmonic, melodic, and rhythmic dictation; music reading. Extensive work in difficult tonal and rhythmic patterns. Four class sessions a week. Prereq.: Music 603–604–605 or satisfactory achievement on a placement test given by the teacher. 3 + 3 + 3 q.h.

MUSIC HISTORY AND LITERATURE

709, 710, 711. *History and Appreciation of Art and Music: General.* Identical with Art 709, 710, 711. 3 + 3 + 3 q.h.

740. *Piano Literature.* The study and interpretation of the standard piano literature from a training as well as a performance viewpoint. Representative literature from the earliest keyboard works to the most recent publications are included. 3 q.h.

780–781–782. *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 the 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. 3 + 3 + 3 q.h.

827–828. *Symphonic Literature.* The historical development of the symphony from its beginning to the present. Symphonic poems, suites, overtures, and miscellaneous compositions for the modern orchestra. 3 + 3 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. 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 780–781. 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; stylist elements contributing to the rise of classicism and culminating in the works of Mozart and Haydn. Prereq.: Music 780–781. 3 q.h.

873. *Beethoven and His Influence in the Musical World.* The life of Beethoven and the society which produced him; his personal growth as reflected in the stylistic changes in his music. Intensive study of representative symphonies, sonatas, and chamber music from each of the stylistic periods. Prereq.: Music 780–781–782. 3 q.h.

874. *19th 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 782. 3 q.h.

875. *Contemporary Music.* Study of musical conditions existing at the end of the nineteenth century: new aesthetics, impressionism, expressionism, neo-classicism, etc., and the musical techniques associated with them. Principal composers of the twentieth century including Bartok, Stravinsky, Milhaud, Prokofieff, Wm. Schumann, and others, and a selected list of their chief masterworks are studied. Prereq.: Music 780–781. 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. 3 q.h.

SACRED MUSIC

761. *Hymnology.* The history of the hymn and the hymn tune; types of hymns and their uses; analysis and interpretation of hymns; evaluation of standard hymnals. 3 q.h.

762. *Gregorian Chant.* The practical and artistic aspects of Gregorian chant in general choir work, the fundamentals of Gregorian rhythm, and authentic and plagal modes and notation. 3 q.h.

763. *Junior and Senior Choir Methods.* Organization, methods, child psychology, the child voice, and materials suitable for choirs; the organization and motivation of the volunteer choir; achieving balance, blend, intonation; interpretation of choral literature, program building, and methods; psychology in rehearsal. 3 q.h.

861. *History of Sacred Music.* The development of great religious music from earliest times to the present, with a study of the Jewish and Christian liturgies and their music, and the Church Year. 3 q.h.

863. *Choral Literature.* The study and interpretation of the standard oratorios, with emphasis on solos, choruses, and accompaniment. A practical course for the singer, organist, and choirmaster. Representative oratorios covered are from the Baroque, Classic, Romantic, and Modern periods. 3 q.h.

CONDUCTING

717. *Vocal Conducting Methods Ensemble.* A course in vocal conducting techniques and ensemble methods. Students make up the ensemble thereby providing a live situation. Ample opportunity for practice in conducting is provided. Materials suitable for use in secondary schools are used and discussed. Three class sessions a week. 3 q.h.

718. *Instrumental Conducting Methods Ensemble.* A course in instrumental conducting techniques and ensemble methods. Students perform on minor instruments, thereby providing an ensemble with ample opportunity for practice in conducting. Materials suitable for secondary schools are used and discussed. Three class sessions a week. Prereq.: Music 717. 3 q.h.

719. *Advanced Choral Conducting.* Advanced conducting technique as it applies to choral groups; rehearsal practices; choral techniques; 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. Three class sessions a week. Practical work with chorus. Sacred music majors take special work in sacred literature for extra credit. Prereq.: Music 718. 3 q.h.

720. *Advanced Instrumental Conducting.* Advanced baton technique and rehearsal techniques for instrumental ensembles. Score-reading, direction of bands and orchestras. Three class sessions a week. Prereq.: Music 718. 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.

525–526–527–528. *Woodwind Methods.* Each student selects a woodwind instrument, which he learns to play as well as possible during the time allotted. As soon as enough progress has been made in playing the instrument chosen, other instruments of the woodwind group may be selected and studied. The problems underlying the teaching of these instruments are kept constantly before the class. Meets two hours a week. 1 + 1 + 1 q.h.

621. *Music Literature and Appreciation.* A survey course with emphasis on the development of listening techniques. Music of the past and present studies as a reflection of its social and cultural milieu. For non-music majors. Prereq.: Music 521. 3 q.h.

625–626–627. *String Methods.* Like Music 525–526–527, but for string instruments. Meets two hours a week. 1 + 1 + 1 q.h.

635–636–637. *Diction (Phonetics).* A course designed to assist singers in diction problems in English and foreign language song literature. The course makes use of the International Phonetic Alphabet, and begins with problems in English diction, carrying over basic principles to the study of Italian, German, and French diction. Three class sessions a week. 2 + 2 + 2 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.

725–726–727. *Brass Methods.* Like Music 525–526–527, but for brass instruments. Meets two hours a week. 1 + 1 + 1 q.h.

728. *Percussion Methods.* Like Music 525–526, but for percussion instruments. Two hours a week. 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. *Junior and Senior High School Vocal Methods.* Applied vocal techniques in a group setting. Methods of instruction for adolescent voices. Repertoire for the adolescent soloist. 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, orches-

tras, 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.

848–849–850. *Piano Pedagogy.* The methods, materials, and special problems involved in the teaching of piano. Supervised practice teaching. 1 + 1 + 1 q.h.

CURRICULUMS

Curriculums for the Degree of Bachelor of Music

Piano Major

Designed for the student primarily interested in performance and/or in teaching (other than in public schools). Total 210 hrs.

First Year	Hrs.
Applied major 507, 508, 509	9
Applied minor 601, 602, 603	3
Mus. Theory I 510, 511, 512	12
Ensembles	3
Comm. 505, 506, 507 Basic I, II, III	9
Soc. Sci. 501, 502, 503 Intro. I, II, III	9
H. & P. E. 509M or 509W	3
H. & P. E. activity courses	3
	51

Second Year	Hrs.
Applied major 607, 608, 609	9
Applied minor 601, 602, 603	3
Mus. Theory II 610, 611, 612	12
Mus. Hist. & Lit. 780, 781, 782	9
Ensembles	3
Comm. 508 Basic course IV	3
***Science elective	3–5
Psychology 601 General	4
H. & P. E. activity courses	3
Accompanying	3
	52

Third Year	Hrs.
Applied major 707, 708, 709	9
Applied minor 701, 702, 703	3
Mus. 751 Analytical Tech.	3
Mus. 717 Vocal Conducting Methods Ensemble	3
Mus. 718 Instrumental Conducting Methods Ensemble	3
Mus. 753–754 Counterpoint I and II	6
Mus. 651, 652 Sight Singing and Ear Training	6
Mus. 740 Piano Literature	3
Adv. Conducting Methods 719 or 720	3
Ensembles	3
Hist. 651–652–653 West. Civ.	9
Accompanying	3
	54

Fourth Year	Hrs.
Applied major 807, 808, 809	9
Applied minor 801, 802, 803	3
Mus. 807 Orchestration	3
Music Elective	3
Mus. 820, 821, 822 Composition I	6
Mus. Hist & Lit. elective or Symphonic Lit. 827–828	9
Physics 608	4
Ensembles	3
Philosophy & Religion elective or Humanities	4
Electives	5
Senior Recital 899	1
Piano Pedagogy 748–749–750	3
	53

Instrumental Major

First Year	Hrs.
Applied major 507, 508, 509	9
Applied minor 501, 502, 503	3
Mus. Theory I 510, 511, 512	12
Ensembles	3
Comm. 505, 506, 507 Basic I, II, III	9
Soc. Sci. 501, 502, 503 Intro. I, II, III	9
H. & P. E. 509M or 509W	3
H. & P. E. activity courses	3
	51

Second Year	Hrs.
Applied major 607, 608, 609	9
Applied minor 601, 602, 603	3
Mus. Theory II 610, 611, 612	12
Mus. Hist. & Lit. 780, 781, 782	9
Ensembles	3
Comm. 508 Basic course IV	3
Physics 608	4
***Science elective	3–5
Psychology 601 General	4
H. & P. E. activity courses	3
	53

Third Year	Hrs.
Applied major 707, 708, 709	9
Applied minor 701, 702, 703	3
Mus. 751 Analytical Techniques	3
Mus. 717 Vocal Conducting Methods Ensemble	3
Mus. 718 Instrumental Conducting Methods Ensemble	3
Mus. 753–754 Counterpoint I and II	6
Mus. 651, 652 Sight Singing and Ear Training	6
Music Hist. & Lit. elective	3
Adv. Conducting Methods 719 or 720	3
Ensembles	3
Music Elective	3
Hist. 651–652–653 West. Civ.	9
	54

*** Requirements may be met by taking Nat. Sci. 523 or any five quarter hour science course.

Fourth Year	Hrs.
Applied major 807, 808, 809	9
Applied minor 801, 802, 803	3
Mus. 807 Orchestration	3
Mus. 809 Band Arranging	3
Mus. 820, 821, 822 Composition I	6
Mus. Hist & Lit. elective or Symphonic Lit. 827–828	9
Ensembles	3
Philosophy & Religious Studies elective or Humanities	4
Electives	8
Senior Recital 899	1
	49

Voice Major

Designed for the student primarily interested in performance and/or in teaching (other than in public schools). Piano is required as the minor.

Entrance Requirements: To enter the four year degree course in voice, the student should be able to sing standard songs and the simpler classics in good English on pitch with correct phrasing and musical intelligence. He should also demonstrate his ability to read a simple song at sight and a knowledge of the rudiments of music. Some knowledge of piano is required.

This curriculum lists 27 hours in foreign languages. If the student has two units of high school French, German or Italian he may substitute 9 hours of electives.

Curriculum for the Degree Bachelor of Music with Major in Voice

First Year	Hrs.
Applied major 507, 508, 509	9
Applied minor 501, 502, 503	3
Music Ensembles	3
Music 510, 511, 512 Theory I	12
Comm. 505, 506, 507 Basic course I, II, III	9
*Italian 501, 502, 503	9
H. & P. E. 509M or 509W	3
H. & P. E. activity course	3
	51

Second Year	Hrs.
Applied major 607, 608, 609	9
Applied minor 601, 602, 603	3
Music 610, 611, 612 Theory II	12
Ensembles	3
Comm. 508	3
*French 501, 502, 503	9
Social Science 501, 502, 503	9
Psychology 601	4
H. & P. E. activity course	3
	55

Third Year	Hrs.
Applied major 707, 708, 709	9
Applied minor 701, 702, 703	3
Music 717 Vocal Conducting Methods	3
Music 718 Instrumental Conducting	3
Music 719 Adv. Vocal Conducting	3
Music History & Literature 780, 781, 782	9
Ensembles	3
Hist. 651–652–653	9
*German 501, 502, 503	9
Physics 608	4
	55

Fourth Year	Hrs.
Applied major 807, 808, 809	9
Applied minor 801, 802, 803	3
Music 820, 821, 822 Composition	6
Music Hist. & Lit. elective or Music 827–828 Sym. Lit.	6
Ensembles	3
Phil. and Rel. Studies elective or Humanities	4
Music 751 Analytical Techniques	3
Music 753–754 Counterpoint I, II	6
Music 851–852 Sight-Singing and Ear-Training	6
**Science elective	3–5
Senior Recital 899	1
	50
Total hours	212

Curriculum for the Degree Bachelor of Music with Major in Composition

First Year	Hrs.
***Applied major	6
Voice (piano majors)	3
Minor: Strings	3
Theory I 510, 511, 512	12
Composition A 513, 514, 515	6
Ensembles	3
Comm. 505, 506, 507	9
Social Science 501, 502, 503	9
	51

Second Year	Hrs.
Applied major	6
Minor: Woodwinds	3
Theory II 610, 611, 612	12
Composition B 613, 614, 615	6
Mus. Hist. & Lit. 780, 781, 782	9
Ensembles	3
Comm. 508	3
**Science elective	3–5
H. & P. E. 509M or 509W	3
H. & P. E. activity course	3
	51–53

Third Year	Hrs.
Applied major	6
Minor: Brass	3
Composition C 713, 714, 715	6
Conducting 717, 718, 719	9
Counterpoint 753, 754	6
Psychology 601	4

* May be omitted if the student has two high school units in the language.

** Requirement may be met by taking Nat. Sci. 523 or any five quarter hour science course.

*** If the student's major instrument is not piano, he must take three quarter hours of piano each year. If the student's major is not voice, he must substitute voice for the minor requirement in his applied major field.

Adv. Sight-Singing and Ear-Training 851, 852	6
Analytical Techniques 751	3
Ensembles	3
H. & P. E. activity course	3
	49

Fourth Year	Hrs.
Applied major	6
Minor: Percussion	1
Conducting 720	3
Mus. Theory, Hist., Lit. elective	9
Orch.—Band Arranging 807, 808	6
Physics 608	4
Composition D 813, 814, 815	6
Hist. 651–652–653	9
Phil. and Rel. Studies elective	4
Ensemble	3
Senior Recital 899	1
	52
Total for Degree	204

Sacred Music Major

Designed for the voice or organ major wishing to specialize in sacred music with a view to becoming a minister of music and/or preparing for advanced study and specialization at the graduate level. This curriculum totals 207 hours.

First Year	Hrs.
Major: Organ or Voice 507, 508, 509	9
Minor: Organ, Voice, Piano 501, 502, 503	3
Mus. 510, 511, 512 Theory I	12
Ensemble	3
Comm. 505, 506, 507	9
Soc. Sci. 501, 502, 503	9
H. & P. E. 509M or 509W Health Educ.	3
H. & P. E. activity courses	3
	51

Second Year	Hrs.
Major: Organ, Voice 607, 608, 609	9
Minor: Organ, Voice, Piano 601, 602, 603	3
Mus. 610, 611, 612 Theory II	12
Ensembles	3
Comm. 508	3
Hist. 651–652–653	9
Physics 608	4
***Science elective	3–5
Psychology 601	4
H. & P. E. activity course	3
	53–55

Third Year	Hrs.
Major: Organ or Voice 707, 708, 709	9
Minor: Organ, Voice, Piano 701, 702, 703	3
Mus. 717 Vocal Conducting Methods Ensemble	3
Mus. 753, 754 Counterpoint I, II	6
Mus. 761 Hymnology	3
Mus. 763 Jr. & Sr. Choir Methods	3
Mus. 780, 781, 782 Mus. Hist. & Literature	9
Ensembles	3
*Accompanying	3
Phil. & Religious Studies or Church History I & II	9
Elective	3
	54

Fourth Year	Hrs.
Major: Organ or Voice 807, 808, 809	9
Minor: Organ, Piano, Voice 801, 802, 803	3
Mus. 751 Analytical Techniques	3
Mus. 762 Gregorian Chant	3
Mus. 820, 821, 822 Composition	6
Mus. 719 Adv. Choral Conducting	3
Mus. 861 Hist. of Sacred Music	3
Mus. 863 Choral Literature	3
Mus. 869 Organ Literature & Service Playing	3
Ensembles	3
*Accompanying	3
Elective	3
**Elective	3
Senior recital 899	1
	49

Music Education Major: Instrumental, Vocal, Piano, or Organ

The following curriculums meet the requirements for the special provisional teaching certificate in Ohio. They total 207 to 217 hours. 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.

Every student majoring in music education must complete one applied music major of 24 quarter hours (courses 504–505–506, 604–605–606, 704–705–706, 804–805–806 in any one instrument or in voice).

Curriculum for the Degree of Bachelor of Music with the Major in Music Education: Instrumental

First Year	Hrs.
Applied major 504, 505, 506	6
Applied minor 501, 502, 503	3
Theory I, 510, 511, 512	12
Woodwind Methods 525, 526, 527	3
Ensembles	6
Comm. 505, 506, 507	9
Social Science	9
*H. & P. E. Activity	3
	51

Second Year	Hrs.
Applied major 604, 605, 606	6
Applied minor 601, 602, 603	3
Theory II, 610, 611, 612	12

*** Requirement may be met by taking Nat. Sci. 523 or any five quarter hour science course.

* For organ majors only.
** For voice majors only.

String Methods 625, 626, 627	3
Mus. Hist. & Lit. 780, 781, 782	9
Ensembles	3
Comm. 508	3
H. & P. E. 509W or 509M	3
*H. & P. E. Activity	3
Psychology 601 General	4
Educ. 501 Introduction	3
	52

Third Year	Hrs.
Applied major 704, 705, 706	6
Applied minor 701, 702, 703	3
Mus. 823 Music in 1st Six Grades	3
Mus. 824 Jr. High Vocal Methods	3
Mus. 825 Teaching Music in Sec. Sch.	3
Brass Methods 725, 726, 727	3
Mus. 717 Vocal Conducting Methods	3
Mus. 718 Instrumental Conducting	3
Mus. 720 Adv. Instru. Conducting	3
Hist. 601, 602, 603	9
Ensemble	3
Music Theory elective	6
Music Hist. & Lit. elective	3
	51

Fourth Year	Hrs.
Applied major 804, 805, 806	6
Applied minor 801, 802, 803	3
**Science Elective	3
Mus. 728 Percussion Methods	1
Educ. 706 Prin. of Teaching	4
Educ. 704 Professional Laboratory Experiences	3
Educ. 708 Educational Sociology	3
Physics 608	4
Phil. or Religious Studies elective	4
Psych. 709 Educational	3
Ensembles	3
Senior Recital 899	1
Student Teaching 843	15
	53
Total hours	207

Curriculum for the Degree Bachelor of Music with the Major in Music Education: Voice

First Year	Hrs.
Voice 504, 505, 506	6
Piano 501, 502, 503	3
Theory I 510, 511, 512	12
Woodwind Methods 525, 526, 527	3
Comm. 505, 506, 507	9
Social Science 501, 502, 503	9
Ensemble	3
H. & P. E. activity course	3
	48

Second Year	Hrs.
Voice 604, 605, 606	6
Piano 601, 602, 603	3
Theory II 610, 611, 612	12
String Methods 625, 626, 627	3
Diction 635, 636, 637	6
Ensemble	3
H. & P. E. activity course	3
Comm. 508	3
Education 501	3
Psychology 601	4
Health Education 509W or 509M	3
Psychology 602	3
	52

Third Year	Hrs.
Voice 704, 705, 706	6
Conducting 717, 718, 719	9
Brass Methods 725, 726, 727	3
Mus. Ed. (1st 6 Grds., Jr. & Sr. High) 823, 824, 825	9
Music History 780, 781, 782	9
History 601, 602, 603	9
Ensemble	3
Educ. 704	3
Theory Elective	3
Percussion Methods 728	1
	55

Fourth Year	Hrs.
Voice 804, 805, 806	6
Ensemble	3
Hist. & Lit. elective	3
Vocal Literature	3
Educ. 706	3
Sociology 708	3
Education 843	15
Theory Elective	3
**Science elective	3–5
Senior Recital 899	1
Physics 608	4
Philosophy and Religious Studies or Humanities electve	
	51–53
Total hours	206

Curriculum for the Degree Bachelor of Music with the Major in Music Education: Piano or Organ

First Year	Hrs.
Piano 504–505–506 or Organ 504–505–506	6
*Voice 501–502–503	3
***Piano 501–502–503	3
Mus. 510–511–512 Theory I	12
Mus. 525–526–527 Woodwind Methods	3
Ensemble	3
Comm. 505–506–507 Basic Course I, II, III	9
Soc. Sci. 501–502–503 Introduction	9
H. & P. E. activity course	3
H. & P. E. 509M or 509W Health Educ.	3
	51

Second Year	Hrs.
Piano 604–605–606 or Organ 604–605–606	6
*Voice 601–602–603	3
***Piano 601–602–603	3
Mus. 610–611–612 Theory II	12
Mus. 725–726–727 Brass Methods	3
Mus. 625–626–627 String Methods	3

* Three hours of marching band may be credited for three hours of H. & P. E. activity.
** Requirement may be met by taking Nat. Sci. 523 or any five quarter hour science course.

* For piano majors only.
*** For organ majors only.

Accompanying	3
Ensemble	3
Comm. 508 Basic Course IV	3
Psychology 601 General	4
Education 501	3
Hist. 601–602–603 U.S. History	9
H. & P. E. activity	3
	55

Third Year	Hrs.
Piano 704–705–706 or Organ 704–705–706	6
**Voice 501–502–503	3
Music 728 Percussion Methods	1
Mus. 717–718 Vocal & Instrumental Cond.	6
Mus. 719 or 720 Advanced Cond.	3
Music 780–781–782 Music History	9
Music Theory & Composition elective	6
Music 823–824–825 Methods	9
Accompanying	3
Ensemble	3
Education 704, Pro. Lab.	3
Psychology 602	3
	55

Fourth Year	Hrs.
Piano 804–805–806 or Organ 804–805–806	6
**Voice 601–602–603	3
*Music 740 Piano Literature	3
**Music 869 Organ Lit. & Service Playing	3
*Music elective	3
Music Hist. & Literature elective	3
*Music 848–849–850 Piano Pedagogy	3
**Music elective	4
Ensemble	3
Music 899 Senior Recital	1
Phil. or Religious Studies elective or Humanities	4
Physics of Sound 608	4
***Science elective	3–5
Educ. 706 Principles of Teaching	3
Educ. 708 Educational Sociology	3
Educ. 843 Supervised Student Teaching	15
	54 or 55
Total hours	215

REQUIREMENTS FOR THE DEGREE

Bachelor of Arts

with Major in the History and Literature of 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 rest are taken in the College of Arts and Sciences, and the other requirements for the degree will be found in the section concerned with that school.

The music study for this degree is regarded as purely cultural and non-professional, and includes no courses in music education. The major consists of 100 quarter hours. A possible four-year curriculum consisting of 190 quarter hours is listed for the students' convenience below and on the following page.

First Year	Hrs.
Applied Music[1] 505–506–507	6
Music 510–511–512 Theory I	12
Communication 505–506–507	9
Social Science 501–502–503	9
Ensemble	3
H. & P. E. activity courses	3
H. & P. E. 509M or 509W	3
	45

Second Year	Hrs.
Applied Music[1] 605-606-607	6
Music 610–611–612 Theory II	12
Communication 508	3
History 605–606–607	9
Art 513, 514	6
Ensemble	3
H. & P. E. activity courses	3
Physics 608	4
	46

Third Year	Hrs.
Music History & Literature[2]	9
Music 717 Analytical Techniques	3
Music 753 Counterpoint I	3
Laboratory Science[3]	12
Phil. or Religious Studies elective or Humanities	4
Psychology 601 General	4
Foreign Language	9
Ensemble	3
	47

Fourth Year	Hrs.
Music History & Literature[2]	15
Music Orchestration 807	3
English Elective[6]	6
Electives[5]	28
	51
Total hours	190

REQUIREMENTS FOR THE DEGREE

Bachelor of Arts

with Major in Applied Music

First Year	Hrs.
Applied Major[1] 505–506–507	6
Music 510–511–512 Theory I	12
Communication 505–506–507	9

* Piano majors must take Music 740, Piano Literature.

** Piano and organ majors may substitute 3 hours of music elective.

*** Requirement may be met by taking Nat. Sci. 623 or any five quarter hour science course.

Social Science 501–502–503	9
Ensemble	3
H. & P. E. activity courses	3
H. & P. E. 509M or 509W	3
	45

Second Year	Hrs.
Applied Major[1] 605–606–607	6
Music 610–611–612 Theory II	12
Communication 508	3
History 605–606–607	9
Foreign Language	9
Ensemble	3
H. & P. E. activity courses	3
Physics 608	4
	51

Third Year	Hrs.
Applied Major 705–706–707	6
Music History 780–781–782	9
Music Elective in Theory	6
Laboratory Science[3]	12
Phil. or Religious Studies Elective or Humanities	4
Ensemble	3
English Elective[6]	6
	46

Fourth Year	Hrs.
Applied Major 805–806–807	6
Music Literature Elective	6
Psychology 601 General	4
Electives[5]	31
	47
Total hours	189

REQUIREMENTS FOR THE DEGREE

Bachelor of Arts

with Major in Music Theory

First Year	Hrs.
Applied Major[1] 505–506–507	6
Music 510–511–512 Theory I	12
Communication 505–506–507	9
Social Science 501–502–503	9
Ensemble	3
H. & P. E. activity courses	3
H. & P. E. 509W or 509M	3
	45

Second Year	Hrs.
Applied major 605, 606, 607	6
Mus. 610, 611, 612 Theory II	12
Communication 508	3
History 651, 652, 653	9
Foreign Language	9
Ensemble	3
H. & P. E. activity courses	3
Physics 608	4
	49

Third Year	Hrs.
Music History 780–781–782	9
Music Theory Elective[4]	6
Laboratory Science[3]	12
Phil. or Religious Studies Elective or Humanities	4
Ensemble	3
Elective[5]	9
English Elective[6]	6
	49

Fourth Year	Hrs.
Music Literature Elective[4]	9
Music Theory Elective[4]	10
Psychology 601 General	4
Electives[5]	24
	47
Total hours	190

1. If the student demonstrates that he has already attained this level of proficiency, he may substitute other music courses, according to his choice and his qualifications.

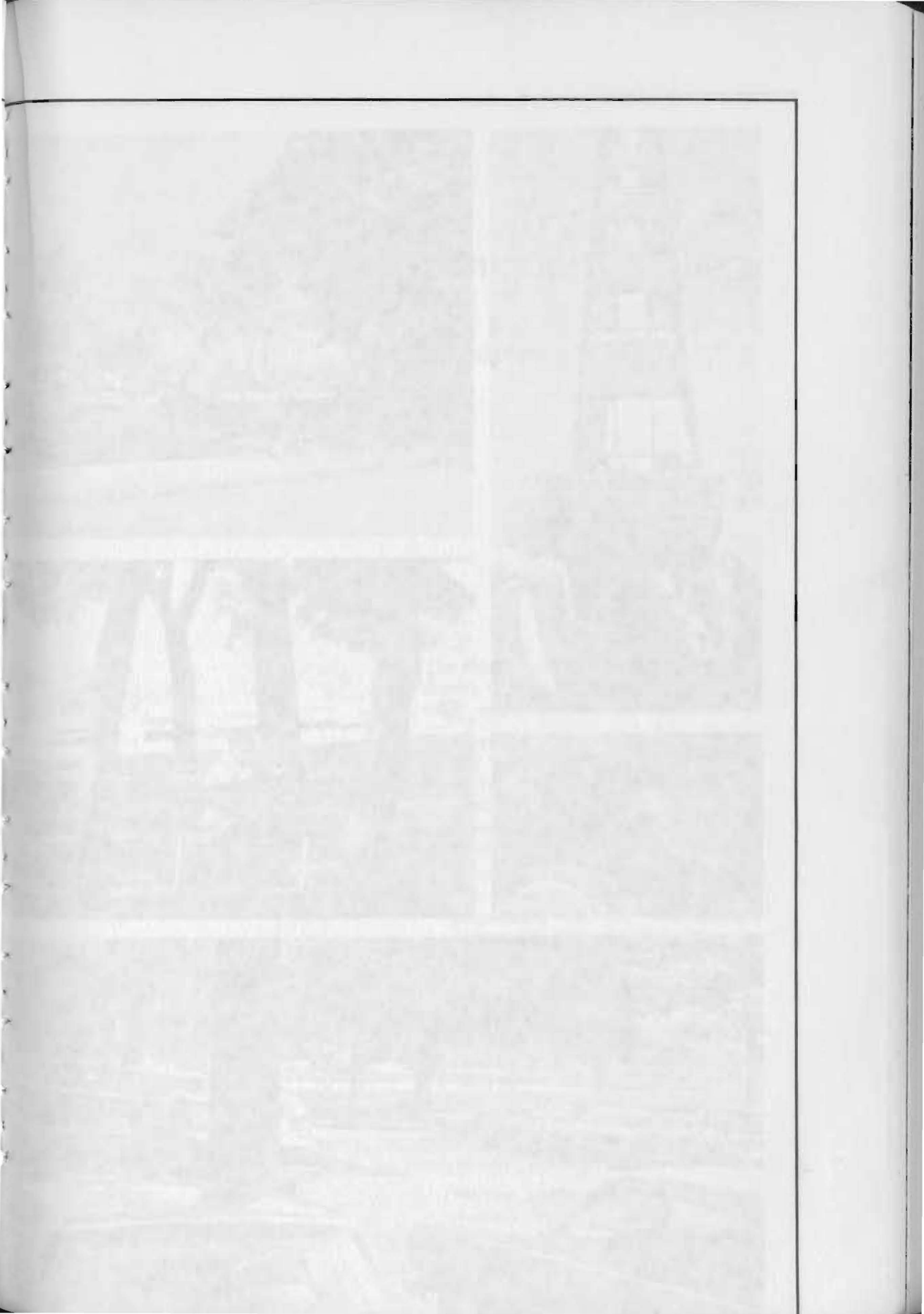
2. Music 780–781–782, Music History and Literature is required. The additional 15 hour requirement may be met by a combination of the following: Music 827, 828, Symphonic Literature; Music 879, Vocal Literature; Music 872, Eighteenth Century and the Viennese Classical School of Music; Music 871, Baroque Music; Music 875, Contemporary Music; Music 874, 19th Century Romantic Period; Music 873, Beethoven and His Influence in the Musical World.

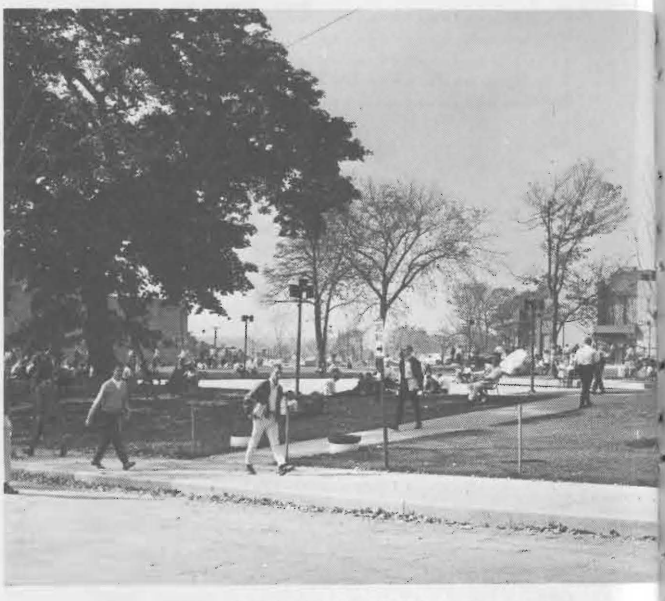
3. A minimum of 16 hours of science is required. Twelve hours must be a laboratory science in one field. Physics 608 will then fulfill the remaining four hours of the science requirement.

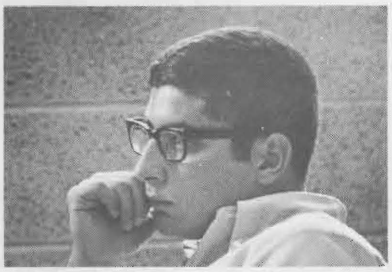
4. Courses must be 700 level or above.

5. Must include 30 hours of courses numbered 700 or higher.

6. Courses must be 600 level or above.







Technical and Community College

Nicholas Paraska, Dean

ORGANIZATION AND DEGREES

OBJECTIVES

The objective of the Technical and Community College is to enhance the educational opportunities available to all by:

1) providing a general two year liberal arts education either as a terminal course or as a pre-baccalaureate course;
2) providing technical education to job-qualify individuals in two years;
3) providing Secretarial Studies education either as a two year program or preparation for the baccalaureate degree in Business Education or Business Administration with a major in Secretarial Studies; and
4) providing continuing education to meet the needs of the community.

The Technical and Community College is organized in seven departments: Business Technology, Continuing Education, Engineering Technology, Special Studies, Nursing, Police Science Technology, and Secretarial Studies.

Two year programs being offered lead to associate degrees as follows:

ASSOCIATE IN ARTS DEGREE

Associate in Arts
Food Service Technology
Police Science Technology

ASSOCIATE IN APPLIED BUSINESS DEGREE

Accounting Technology
Advertising Technology
Business Management Technology
Commercial Art Technology
General Business Technology
Merchandising Technology
Public Administration Technology
Secretarial Studies
Transportation Management Technology

ASSOCIATE IN APPLIED SCIENCE DEGREE

Civil Engineering Technology
Computer Technology
Electrical Engineering Technology
Mechanical Engineering Technology
Metallurgical Engineering Technology
Nursing

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. They are explained in the General Requirements and Regulations section but the exact course requirements are given in the curriculum for each program.

COURSES OF INSTRUCTIONS AND CURRICULUMS

DEPARTMENT OF BUSINESS TECHNOLOGY

All courses included in the business technology curricula are listed under other departments.

CURRICULA

The following curricula lead to the Associate in Applied Business Degree.

ACCOUNTING TECHNOLOGY

First Year

First Quarter	Hrs.
Comm. 505 Basic Course I	3
Geog. 519 Economic Geography	5
H&PE Activity Course	1
*Orientation 501 Study Skills	3
	12

Second Quarter	Hrs.
Comm. 506 Basic Course II	3
Soc. Sci. 501 Introduction to Social Science	3
Psych. 501 Introduction to Psychology	3
H&PE Activity Course	1
*Orientation 502 Study Skills	3
	13

Third Quarter	Hrs.
Comm. 507 Basic Course III	3
Soc. Sci. 502 Introduction to Economics	3
Bus. Org. 511 Introduction to Business	3
H&PE Activity Course	1
Acctg. 601 Elementary Accounting I	3
	13

Fourth Quarter	Hrs.
H&PE 509 Health Education	3
Soc. Sci. 503 Introduction to Political Science	3
Acctg. 602 Elementary Accounting II	3
Math. 531 Mathematics of Business or Math. 542 Special Topics of Algebra	5
	14

Second Year

Fifth Quarter	Hrs.
Acctg. 603 Elementary Accounting III	3
Bus. Org. 701 Law I	3
Econ. 601 Principles of Economics	3
Mdsg. 624 Marketing	5
Electives (Bus. Org.)	3
	17

Sixth Quarter	Hrs.
Acctg. 713 Basic Cost Accounting	4
Acctg. 710 Basic Concepts of Data Processing	3
Econ. 602 Principles of Economics II	3
Mdsg. 625 Salesmanship	3
Electives (Bus. Org.)	3
	16

Seventh Quarter	Hrs.
Econ. 603 Principles of Economics III	3
Acctg. 810 Statement Analysis	3

* If Orientation 501 and 502 are waived, add 6 hours Business Administration electives.

Acctg. 714 Advanced Cost Accounting ..	4
Bus. Org. 712 Business Letters	3
Electives (Bus. Adm.)	3
	16
Total Credit Hours	101

ADVERTISING TECHNOLOGY

First Year

First Quarter	Hrs.
Comm. 505 Basic Course I	3
Geog. 519 Economic Geography	5
H&PE Activity Course	1
*Orientation 501 Study Skills	3
	12

Second Quarter	Hrs.
Comm. 506 Basic Course II	3
H&PE Activity Course	1
*Orientation 502 Study Skills	3
Psych. 501 Introduction to Psychology ..	3
Soc. Sci. 501 Introduction to Social Science	3
	13

Third Quarter	Hrs.
Adv. 627 Advertising Principles I	3
Bus. Org. 511 Introduction to Business ..	3
Comm. 507 Basic Course III	3
H&PE Activity Course	1
H&PE 509 Health Education	3
Soc. Sci. 502 Introduction to Economics ..	3
	16

Fourth Quarter	Hrs.
Adv. 628 Advertising Principles II	3
Art 510 Color & Design	3
Math. 531 Mathematics of Business	5
Soc. Sci. 503 Introduction to Political Science	3
	14

Second Year

Fifth Quarter	Hrs.
Acctg. 601 Elementary Accounting I	3
Adv. 629 Advertising Procedures	3
Econ. 601 Principles of Economics	3
Mdsg. 624 Marketing	5
	14

Sixth Quarter	Hrs.
Acctg. 602 Elementary Accounting II ...	3
Adv. 729 Advertising Copywriting	3
Econ. 602 Principles of Economics II ...	3
Mdsg. 625 Salesmanship	3
Electives (Bus. Adm.)	3
	15

Seventh Quarter	Hrs.
Adv. 730 Advertising Copy-Layout I	3
Adv. P.R. 710 Basic Public Relations	3
Econ. 603 Principles of Economics III ...	3
Bus. Org. 712 Business Letters	3
Electives (Bus. Adm.)	6
	18
Total Credit Hours	102

* If Orientation 501 and 502 are waived, add 6 hours Business Administration electives.

BUSINESS MANAGEMENT TECHNOLOGY

First Year

First Quarter	Hrs.
Comm. 505 Basic Course I	3
Soc. Sci. 501 Introduction to Social Science	3
Bus. Org. 511 Introduction to Business ..	3
H&PE Activity Course	1
Math. 531 Mathematics of Business	5
	15

Second Quarter	Hrs.
Comm. 506 Basic Course II	3
Soc. Sci. 502 Introduction to Economics ..	3
H&PE 509 Health Education	3
H&PE Activity Course	1
Mdsg. 624 Marketing	5
Econ. 601 Principles of Economics I	3
	18

Third Quarter	Hrs.
Comm. 507 Basic Course III	3
Soc. Sci. 503 Introduction to Political Science	3
H&PE Activity Course	1
Econ. 602 Principles of Economics II	3
Psych. 601 General Psychology	4
Bus. Org. 701 Law I	3
	17

Second Year

Fourth Quarter	Hrs.
Acctg. 601 Elementary Accounting I	3
Econ. 603 Principles of Economics III	3
Bus. Org. 725 Fundamentals of Management	5
Mdsg. 720 Industrial Marketing	3
Pol. Sci. 601 American National Government	3
	17

Fifth Quarter	Hrs.
Acctg. 602 Elementary Accounting II	3
Econ. 704 Economics and Social Statistics I	3
Bus. Org. 722 Insurance Fundamentals ..	3
Bus. Org. 720 Business Finance	4
Bus. Org. 705 Principles of Transportation	5
	18

Sixth Quarter	Hrs.
Acctg. 603 Elementary Accounting III ...	3
Bus. Org. 750 Human Behavior in Organization	4
Bus. Org. 730 Investment Analysis and Management	3

Bus. Org. 740 Office Management and Methods	3
Bus. Org. 712 Business Letters	3
	16
Total Credit Hours	101

COMMERCIAL ART TECHNOLOGY

First Year

First Quarter	Hrs.
Comm. 505 Basic Course I	3
Bus. Org. 511 Introduction to Business	3
Art 510 Color & Design	3
Adv. 627 Advertising Principles I	3
Art 601 Beginning Drawing	3
H&PE Activity Course I	1
	16

Second Quarter	Hrs.
Comm. 506 Basic Course II	3
Art 511 Color & Design	3
Adv. 628 Advertising Principles II	3
Art 602 Drawing	3
Art 623 Advertising Art I	3
H&PE Activity Course	1
	16

Third Quarter	Hrs.
Comm. 507 Basic Course III	3
Math. 531 Mathematics of Business	5
Art 624 Advertising Art II	3
Art 606 Beginning Painting	3
Adv. 629 Advertising Procedures	3
	17

Second Year

First Quarter	Hrs.
Soc. Sci. 501 Introduction to Social Science	3
Adv. 729 Advertising Copywriting	3
Acctg. 601 Elementary Accounting I	3
Mdsg. 624 Marketing	5
Psych. 601 General Psychology	4
	18

Second Quarter	Hrs.
Soc. Sci. 502 Introduction to Economics	3
Art 611 Printmaking	3
Acctg. 602 Elementary Accounting II	3
Adv. 629 Advertising Procedures	3
H&PE 509 Health Education	3
Adv. 730 Advertising Copy-Layout I	3
	18

Third Quarter	Hrs.
Soc. Sci. 503 Introduction to Political Science	3
Art 514 Survey of Art	3
Adv. 731 Advertising Copy-Layout II	3
Acctg. 603 Elementary Accounting III	3
Bus. Org. 701 Law I	3
H&PE Activity Course	1
	16
Total Credit Hours	101

GENERAL BUSINESS TECHNOLOGY

First Year

First Quarter	Hrs.
Comm. 505 Basic Course I	3
Geog. 519 Economic Geography	5
*Orientation 501 Study Skills	3
H&PE Activity Course	1
	12

Second Quarter	Hrs.
Comm. 506 Basic Course II	3
Psych. 501 Introduction to Psychology	3
Soc. Sci. 501 Introduction to Social Science	3
HP&E Activity Course	1
*Orientation 502 Study Skills	3
	13

Third Quarter	Hrs.
Bus. Org. 511 Introduction to Business	3
Comm. 507 Basic Course III	3
Soc. Sci. 502 Introduction to Economics	3
H&PE 509 Health Education	3
HP&E Activity Course	1
	13

Fourth Quarter	Hrs.
Acctg. 601 Elementary Accounting I	3
Mdsg. 624 Marketing	5
Math. 531 Mathematics of Business or Math. 542 Special Topics of Algebra	5
Soc. Sci. 503 Introduction to Social Science	3
	16

Second Year

Fifth Quarter	Hrs.
Acctg. 602 Elementary Accounting II	3
Econ. 601 Principles of Economics I	3
Bus. Org. 725 Fundamentals of Management	5
Mdsg. 625 Salesmanship	3
Bus. Org. 701 Law I	3
	17

Sixth Quarter	Hrs.
Acctg. 603 Elementary Accounting III	3
Bus. Org. 722 Insurance Fundamentals	3
Bus. Org. 712 Business Letters	3
Econ. 602 Principles of Economics II	3
Electives (Bus. Adm.)	3
	15

Seventh Quarter	Hrs.
Bus. Org. 720 Business Finance	4
Bus. Org. 740 Office Management and Methods	3
Econ. 603 Principles of Economics III	3

* If Orientation 501 and 502 are waived, add 6 hours Business Administration electives.

Bus. Org. 713 Report Writing	3
Electives (Bus. Adm.)	3
	16
Total Credit Hours	102

MERCHANDISING TECHNOLOGY

First Year

First Quarter	Hrs.
Comm. 505 Basic Course I	3
HP&E Activity Course	1
Geog. 519 Economic Geography	5
*Orientation 501 Study Skills	3
	12

Second Quarter	Hrs.
Comm. 506 Basic Course II	3
H&PE Activity Course	1
*Orientation 502 Study Skills	3
Soc. Sci. 501 Introduction to Social Science	3
Psych. 501 Introduction to Psychology	3
	13

Third Quarter	Hrs.
Comm. 507 Basic Course III	3
H&PE Activity Course	1
Soc. Sci. 502 Introduction to Economics	3
H&PE 509 Health Education	3
Bus. Org. 511 Introduction to Business	3
	13

Fourth Quarter	Hrs.
Soc. Sci. 503 Introduction to Political Science	3
Acctg. 601 Elementary Accounting I	3
Mdsg. 624 Marketing	5
Mdsg. 530 Introduction to Merchandising Techniques	5
	16

Second Year

Fifth Quarter	Hrs.
Econ. 601 Principles of Economics I	3
Mdsg. 625 Salesmanship	3
Acctg. 602 Elementary Accounting II	3
Adv. 627 Advertising Principles I	3
Mdsg. 737 Textile Fabrics I	3
	15

Sixth Quarter	Hrs.
Econ. 602 Principles of Economics II	3
Adv. 628 Advertising Principles II	3
Mdsg. 735 Visual Merchandise Presentation	3
Mdsg. 738 Textile Fabrics II	3
Mdsg. 740 Merchandising of Women's Fashions	3
	15

Seventh Quarter	Hrs.
Econ. 603 Principles of Economics III	3
Mdsg. 711 Management of Retail Buying	3
Mdsg. 831 Executive Protocol	2
Mdsg. 731 Non-Textiles or Mdsg. 720 Industrial Marketing	3
Electives (Mdsg.)	6
	17
Total Credit Hours	101

* If Orientation 501 and 502 are waived, add 6 hours Business Administration electives.

PUBLIC ADMINISTRATION TECHNOLOGY

First Year

First Quarter	Hrs.
Comm. 505 Basic Course I	3
Soc. Sci. 501 Introduction to Social Science	3
H&PE Activity Course	1
Geog. 519 Economic Geography	5
Bus. Org. 511 Introduction to Business	3
	15

Second Quarter	Hrs.
Comm. 506 Basic Course II	3
Soc. Sci. 502 Introduction to Economics	3
H&PE Activity Course	1
Math. 531 Mathematics of Business	5
H&PE 509 Health Education	3
	15

Third Quarter	Hrs.
Pol. Sci. 600 Elements of American Government	3
Comm. 507 Basic Course III	3
Soc. Sci. 503 Introduction to Political Science	3
Econ. 601 Principles of Economics I	3
H&PE Activity Course	1
Psych. 601 General Psychology	4
	17

Second Year

Fourth Quarter	Hrs.
Pol. Sci. 601 American National Government	3
Econ. 602 Principles of Economics II	3
Acctg. 601 Elementary Accounting I	3
Bus. Org. 720 Business Finance	4
Pol. Sci. 704 American Politicial Parties	3
Bus. Org. 701 Law I	3
	19

Fifth Quarter	Hrs.
Econ. 603 Principles of Economics III	3
Pol. Sci. 602 American State and Local Government	3
Acctg. 602 Elementary Accounting II	3
Pol. Sci. 720 Public Administration	3
Adv. P.R. 710 Basic Public Relations	3
Bus. Org. 712 Business Letters	3
	18

Sixth Quarter	Hrs.
Acctg. 603 Elementary Accounting III	3
Bus. Org. 725 Fundamentals of Management	5
Pol. Sci. 721 Urban Government	3

Bus. Org. 740 Office Management and Methods	3
Bus. Org. 833 Public Utilities	3
	17
Total Credit Hours	101

TRANSPORTATION MANAGEMENT TECHNOLOGY

First Year

First Quarter	Hrs.
Bus. Org. 511 Introduction to Business	3
Comm. 505 Basic Course I	3
Soc. Sci. 501 Introduction to Social Science	3
H&PE Activity Course	1
Math. 531 Mathematics of Business	5
	15

Second Quarter	Hrs.
Comm. 506 Basic Course II	3
Soc. Sci. 502 Introduction to Economics	3
Econ. 601 Principles of Economics I	3
H&PE 509 Health Education	3
H&PE Activity Course	1
Mdsg. 624 Marketing	5
	18

Third Quarter	Hrs.
Comm. 507 Basic Course III	3
Soc. Sci. 503 Introduction to Political Science	3
Econ. 602 Principles of Economics II	3
Bus. Org. 701 Law I	3
Psych. 601 General Psychology	4
H&PE Activity Course	1
	17

Second Year

Fourth Quarter	Hrs.
Acctg. 601 Elementary Accounting I	3
Bus. Org. 712 Business Letters	3
Bus. Org. 702 Law II	3
Econ. 603 Principles of Economics III	3
Bus. Org. 725 Fundamentals of Management	5
	17

Fifth Quarter	Hrs.
Acctg. 602 Elementary Accounting II	3
Econ. 704 Economics and Social Studies I	3
Bus. Org. 705 Principles of Transportation	5
Bus. Org. 707 Commercial Motor Transportation	5
	16

Sixth Quarter	Hrs.
Acctg. 603 Elementary Accounting III	3
Bus. Org. 746 Industrial Traffic Management	3
Adv. P.R. 710 Basic Public Relations	3
Bus. Org. 720 Business Finance	4
Bus. Org. 722 Insurance Fundamentals	3
Bus. Org. 808 Water Transportation	3
	19
Total Credit Hours	102

DEPARTMENT OF ENGINEERING TECHNOLOGY

Associate Professor Richley (chairman); Assistant Professor Terlecki.

The Associate in Applied Science Degree is awarded to recognize graduation in the following programs.

CIVIL ENGINEERING TECHNOLOGY

603. *Structural Drafting.* Instruction in drafting room procedures and methods used in map drawing and in the graphical presentation of wood, steel, and concrete structures. Emphasis is placed on working drawing and on detailing structural steel and reinforced concrete members. One hour of lecture and three hours of laboratory per week. Prereq.: ME 501. 2 q.h.

605. *Strength of Materials.* Elementary theory in relationships between load, stress, strain in tension, compression, direct and torsional shear, and stresses in simple beams. Prereq.: MET 520. 3 q.h.

605L. *Strength of Materials Laboratory.* Instruction in use and care of testing machines and equipment and experimental verification of theories of strength of materials. Three hours of laboratory per week. Taken concurrently with CET 605. 1 q.h.

606. *Construction Materials.* A study of aggregates, portland and asphalt cement, concrete, lumber, and steel and their roles in construction. 3 q.h.

606L. *Construction Materials Laboratory.* Testing of construction materials as usually encountered in control of construction with emphasis on ASTM and AASHO standard tests. Three hours of laboratory per week. Taken concurrently with CET 606. 1 q.h.

610. *Elementary Structures.* An introduction to structural analysis and determination of reactions, shears, moments, and stresses in structural members. 3 q.h.

615. *Soil Mechanics.* A study of properties of soils, soil classification, strength and bearing capacity, compressibility, seepage, and frost action. 3 q.h.

615L. *Soil Mechanics Laboratory.* Practice in soil identification and classification and determination of seepage, compressibility, and bearing capacity through laboratory testing of soils. Three hours of laboratory per week. Taken concurrently with CET 615. 1 q.h.

620. *Construction Management.* A study of construction planning; determination of materials, equipment, and labor; construction scheduling and supervision of construction. 3 q.h.

622. *Advanced Surveying.* Precise surveying instruments and practice. Land and city surveying. Plane coordinate systems in cadastral surveying. Topographic mapping. 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.

First Year

First Quarter	Hrs.
Math. 502 Algebra II	5
Comm. 505 Basic Course I	3
ME 500 Engineering Drawing	3
H&PE Activity Course	1
Nat. Sci. 520 Physical Science	3
	15

Second Quarter	Hrs.
Physics 501 Fundamentals of Physics	3
Math. 503 Trigonometry	3
Comm. 506 Basic Course II	3
ME 501 Engineering Drawing	3
H&PE Activity Course	1
H&PE 509 Health Education	3
	16

Third Quarter	Hrs.
Math. 550 Introduction to Calculus	5
Comm. 507 Basic Course III	3
CE 720 Surveying I	3
CE 720L Surveying I Laboratory	1
H&PE Activity Course	1
Physics 502 Fundamentals of Physics	3
	16

Summer Quarter	Hrs.
Physics 503 Fundamentals of Physics	3
Physics 503L Fundamentals of Physics Laboratory	1
	4

Second Year

Fourth Quarter	Hrs.
MET 520 Mechanics	5
CE 721 Surveying II	3
CE 721L Surveying II Laboratory	1
Soc. Sci. 501 Introduction to Social Science	3
CET 603 Structural Drafting	2
	14

Fifth Quarter	Hrs.
CET 615 Soil Mechanics	3
CET 615L Soil Mechanics Laboratory	1
Soc. Sci. 502 Introduction to Economics	3
CET 620 Construction Management	3
CET 605 Strength of Materials	3
CET 605L Strength of Materials Laboratory	1
ME 502 Descriptive Geometry	3
	17

Sixth Quarter	Hrs.
CET 622 Advanced Surveying	3
CET 622L Advanced Surveying Laboratory	1
Soc. Sci. 503 Introduction to Political Science	3
CET 610 Elementary Structures	3
CET 606 Construction Materials	3
CET 606L Construction Materials Laboratory	1
Electives (Non-Technical)	3
	17

Total Credit Hours 99

COMPUTER TECHNOLOGY

501. *Data Processing Concepts.* Evolution of Data processing; introduction to business structures and Data processing; the unit record; principles of operation of unit record equipment; laboratory exercises will be executed involving planning and wiring a range of unit record equipment. Three hours of lecture and three hours of laboratory per week. 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. Prereq.: CPT 501. 3 q.h.

601, 602, 603. *Scientific Programming I, II, and III.* Introduction to the use of computers by engineers and scientists; study of the high level scientific programming language known as FORTRAN; application of FORTRAN to engineering and scientific problems, scaling, floating point arithmetic and an introduction to numerical analysis. Three hours of lecture and three hours of laboratory per week. Prereq.: Math. 550, Nat. Sci. 521 or equivalents. 4 + 4 + 4 q.h.

610. *Fundamentals of Programming.* History of languages, fundamental concepts for the understanding of stored programming; flow charting, input and output data conversion; assembly programs, subroutines and macro routines and use of utility programs. The high level business oriented language known as COBOL will be used as the instrument of this study. The writing and testing of problems in COBOL language. Four hours of lecture and three hours of laboratory per week. Prereq.: CPT 502. 5 q.h.

611. *Programming-S/360 Assembler.* Detailed study of the assembler language of IBM

360. 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 610. 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. 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. 602, CPT 611. 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 611. 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. 4 q.h.

620. *Data Processing Supervision.* 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. Three hours of lecture and three hours of laboratory per week. Prereq.: CPT 614. 4 q.h.

First Year

First Quarter	Hrs.
Math. 502 Algebra II	5
Comm. 505 Basic Course I	3
Nat. Sci. 520 Physical Science	3
CPT 501 Data Processing Concepts	4
H&PE Activity Course	1
	16

Second Quarter	Hrs.
Math. 503 Trigonometry	3
Comm. 506 Basic Course II	3
Nat. Sci. 521 Physical Science	3
CPT 502 Computer Concepts	3
Acctg. 601 Elementary Accounting I	3
H&PE Activity Course	1
	16

Third Quarter	Hrs.
Math. 550 Introduction to Calculus	5
Comm. 507 Basic Course III	3
CPT 610 Fundamentals of Programming	5
Acctg. 602 Elementary Accounting II	3
	16

Second Year

Fourth Quarter	Hrs.
Soc. Sci. 501 Introduction to Social Science	3
CPT 601 Scientific Programming I	4
CPT 611 Programming-S/360 Assembler	4
H&PE 509 Health Education	3
H&PE Activity Course	1
	15

Fifth Quarter	Hrs.
Soc. Sci. 502 Introduction to Economics	3
CPT 602 Scientific Programming II	4
CPT 612 Programming-PL/1	4
CPT 614 Business Systems and Procedures	3
Electives (Liberal Arts)	3
	17

Sixth Quarter	Hrs.
Soc. Sci. 503 Introduction to Political Science	3
CPT 603 Scientific Programming III	4
CPT 618 Data Processing Applications	4
CPT 616 Operating Systems	3
CPT 620 Data Processing Supervision	4
	18

Total Credit Hours 98

ELECTRICAL ENGINEERING TECHNOLOGY

Associate Professor Richley (supervisor).

500. *Electrical Drafting.* Standard electrical symbols; types of electrical diagrams, elementary wiring diagrams for industrial buildings, power plants, industrial controls, and communication circuits; lineless diagrams, wiring lists; layouts for chassis, panels, switchboards, laboratories; multiview drawings, pictorial drawings, sections, details of electrical equipment. Prereq.: ME 500. 2 q.h.

501. *Circuit Theory I.* Fundamental electrical definitions and units; electrical energy sources, Ohms Law, Kirchhoff's Laws; analysis of D.C. circuits; network theorems; magnetic circuits and permanent magnets. Prereq.: Math. 502, Nat. Sci. 520. Concurrent: Math. 503. 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. 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. 550. 3 q.h.

502L. *Circuit Theory II Laboratory.* Experiments on the measurements 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. 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. 550. 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. 1 q.h.

600. *Measurements.* Error 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. 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. 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. 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. 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. 3 q.h.

606L. *Electronics II Laboratory.* Experiments on vacuum tube amplifiers; transistor amplifiers; R-C coupled amplifiers; power amplifiers; magnetic amplifiers. Three hours of laboratory per week. Taken concurrently with EET 606. 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. 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. 1 q.h.

609. *Analog Computers.* Theory and operation of the analog computer. Emphasis is placed on circuit operation and usage rather than design. One hour of lecture and three hours of laboratory per week. Concurrent: EET 606. 2 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. 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. 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. 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. 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 Controls.* Analysis of electronic control circuits in industry; feedback circuits; electronic timers; photoelectric devices; electronic power conversion; motor control; heating system control; servomechanisms. Concurrent: EET 611, EET 607. 3 q.h.

First Year

First Quarter	Hrs.
Math. 502 Algebra II	5
Nat. Sci. 520 Physical Science	3
Comm. 505 Basic Course I	3
ME 500 Drawing Fundamentals	3
H&PE 509 Health Education	3
	17

Second Quarter	Hrs.
Math. 503 Trigonometry	3
Physics 501 Fundamentals of Physics	3
Comm. 506 Basic Course II	3
EET 500 Electrical Drafting	2
EET 501 Circuit Theory I	3
EET 501L Circuit Theory I Laboratory	1
H&PE Activity Course	1
	16

Third Quarter	Hrs.
Math. 550 Introduction to Calculus	5
Physics 502 Fundamentals of Physics	3
Comm. 507 Basic Course III	3
EET 502 Circuit Theory II	3
EET 502L Circuit Theory II Laboratory	1
H&PE Activity Course	1
	16

Second Year

Fourth Quarter	Hrs.
Soc. Sci. 501 Introduction to Social Science	3
H&PE Activity Course	1
EET 503 Circuit Theory III	3
EET 503L Circuit Theory III Laboratory	1
EET 600 Measurements	3
EET 600L Measurements Laboratory	1
EET 605 Electronics I	3
EET 605L Electronics I Laboratory	1
	16

Fifth Quarter	Hrs.
Soc. Sci. 502 Introduction to Economics	3
EET 606 Electronics II	3
EET 606L Electronics II Laboratory	1
EET 610 Direct Current Machines	3
EET 610L Direct Current Machines Laboratory	1
CPT 601 Scientific Programming I	4
EET 609 Analog Computer	2
	17

Sixth Quarter	Hrs.
Soc. Sci. 503 Introduction to Political Science	3
EET 607 Electronics III	3
EET 607L Electronics III Laboratory	1
EET 611 Alternating Current Machines	3
EET 611L Alternating Current Machines Laboratory	1
EET 612 Electrical Power Systems or EET 614 Industrial Controls	3
Electives (Liberal Arts)	3
	17
Total Credit Hours	99

MECHANICAL ENGINEERING TECHNOLOGY

510. *Manufacturing Processes.* A course in the study of manufacturing materials, methods, processes, tooling and equipment. Topics include welding, forging, casting, molding, hot and cold working and production machining. 3 q.h.

520. *Mechanics.* The study of forces, couples and resultants; equilibrium of force systems; motion of particles and rigid bodies; work and energy. Prereq.: Physics 501. 5 q.h.

600. *Advanced Drawing.* The detail, assembly and specifications of a complete machine. One hour lecture and five hours laboratory per week. Prereq.: CET 605, ME 501. 3 q.h.

605. *Thermodynamics.* The study of the first and second laws of thermodynamics involving gases, vapors and mixtures and their application to thermodynamic cycles such as compressors, steam plants, I.C. engines and refrigeration. Prereq.: Physics 502, Math. 550. 4 q.h.

606. *Machine Design I.* Study and design of machine elements, such as bolts, screws, shafting and welded connections. Prereq.: CET 605. 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. Prereq.: 606. 4 q.h.

610. *Mechanical Equipment.* The study of common mechanical equipment such as refrigerators, pumps, internal combustion engines and vibration equipment. Prereq.: CET 605, MET 605. 3 q.h.

610L. *Mechanical Equipment Laboratory.* Laboratory tests and application of equipment covered in MET 610. Three hours laboratory per week. Concurrent with MET 610. 1 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.: CET 605. 3 q.h.

621. *Machine Tools.* Study and practice in the use of machine shop tools such as drill presses, shapers, milling machines and grinders. One hour lecture and five hours laboratory per week. Concurrent: MET 620. 3 q.h.

First Year

First Quarter	Hrs.
Math. 502 Algebra II	5
ME 500 Drawing Fundamentals	3
H&PE Activity Course	1
Comm. 505 Basic Course I	3
Nat. Sci. 520 Physical Science	3
	15

Second Quarter	Hrs.
Math. 503 Trigonometry	3
ME 501 Engineering Drawing	3
H&PE Activity Course	1
Physics 501 Fundamentals of Physics	3
Comm. 506 Basic Course II	3
MET 510 Manufacturing Procedures	3
	16

Third Quarter	Hrs.
Math. 550 Introduction to Calculus	5
H&PE Activity Course	1
MET 520 Mechanics	5
Comm. 507 Basic Course III	3
Physics 502 Fundamentals of Physics	3
	17

Second Year

Fourth Quarter	Hrs.
Physics 503 Fundamentals of Physics	3
Physics 503L Fnudamentals of Physics Laboratory	1
Soc. Sci. 501 Introduction to Social Science	3
CET 605 Strength of Materials	3
CET 605L Strength of Materials Laboratory	1
MET 605 Thermodynamics	4
ME 502 Descriptive Geometry	3
	18

Fifth Quarter	Hrs.
Soc. Sci. 502 Introduction to Economics	3
MET 606 Machine Design I	4
MET 600 Advanced Drawing	3
CPT 601 Scientific Programming I	3
MET 610 Mechanical Equipment	3
MET 610L Mechanical Equipment Laboratory	1
	17

Sixth Quarter	Hrs.
Soc. Sci. 503 Introduction to Political Science	3
MET 607 Machine Design II	4
MET 620 Tool Design	3
MET 621 Machine Tools	4
H&PE 509 Health Education	3
	17

Total Credit Hours 100

METALLURGICAL ENGINEERING TECHNOLOGY

Assistant Professor Terlecki (supervisor).

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. 506. 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. 506. 2 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. 1 q.h.

600. *Spectroscopy.* The nature of light, the atom and the electromagnetic spectrum as related to the study of spectrographic emission equipment. Theory and practice of photography of the spectrum and film, calibration, qualitative and quantitative analysis of alloys. Use of carbon analysis. Prereq.: Physics 502, Chem. 506. 3 q.h.

600L. *Spectroscopy Laboratory.* Analysis of metallic specimens (alloys of various composition). Calibration of equipment, standardized spectrum film. Identification of the alloys spectrum range. Correlation of spectra and alloy composition and construction of table. Three hours of laboratory per week. Taken concurrently with MTT 600. 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 600, Physics 503. 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 nonferrous 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. 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 v. plastic deformation, strain, yield; failure vs. fracture and hot-working vs. cold-working. Prereq.: MTT 500. 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. 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. Prereq.: MTT 604. 4 q.h.

606L. *Physical Metallurgy (Adaptive II) Laboratory.* The micro-examinations of prepared metallographic, specimens of ferrous metals and alloys; sketches made of micro-structures, written interpretations and correlations made with the known history of each specimen. Six hours of laboratory per week. Taken concurrently with MTT 606. 2 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. Prereq.: MTT 606. 4 q.h.

608L. *Physical Metallurgy (Adaptive III) Laboratory.* Micro-examination of prepared specimens of non-ferrous metals and their alloys of known compositions and prior physical treatments. Sketches made of each with interpretations and correlation to the known history of each specimen. Six hours of laboratory per week. Taken concurrently with MTT 608. 2 q.h.

First Year

First Quarter	Hrs.
Math. 502 Algebra II	5
Chem. 505 Fundamentals of Chemistry	4
Comm. 505 Basic Course I	3
Nat. Sci. 520 Physical Science	3
H&PE Activity Course	1
	16

Second Quarter	Hrs.
Math. 503 Trigonometry	3
Chem. 506 Fundamentals of Chemistry	4
Comm. 506 Basic Course II	3
Physics 501 Fundamentals of Physics	3
Soc. Sci. 501 Introduction to Social Science	3
H&PE Activity Course	1
	17

Third Quarter	Hrs.
Math. 550 Introduction to Calculus	5
Physics 502 Fundamentals of Physics	3
Comm. 507 Basic Course III	3
MTT 500 Introduction to Metallurgy (Extractive)	3
MTT 501 Foundry and Metal Casting	2
MTT 501L Foundry and Metal Casting Laboratory	1
H&PE Activity Course	1
	18

Second Year

Fourth Quarter	Hrs.
Physics 503 Fundamentals of Physics	3
Physics 503L Fundamentals of Physics Laboratory	1
CET 605 Strength of Materials	3
CET 605L Strength of Materials Laboratory	1
MTT 600 Spectroscopy	3
MTT 600L Spectroscopy Laboratory	1
MTT 604 Physical Metallurgy (Adaptive I)	3
MTT 604L Physical Metallurgy (Adaptive I) Laboratory	1
	16

Fifth Quarter	Hrs.
Soc. Sci. 502 Introduction to Economics	3
EET 600 Measurements	3
EET 600L Measurements Laboratory	1
MTT 602 Non-Destructive Inspection	3
MTT 602L Non-Destructive Inspection Laboratory	1
MTT 606 Physical Metallurgy (Adaptive II)	4
MTT 606L Physical Metallurgy (Adaptive II) Laboratory	2
	17

Sixth Quarter	Hrs.
Soc. Sci. 503 Introduction to Political Science	3
MTT 608 Physical Metallurgy (Adaptive III)	4
MTT 608L Physical Metallurgy (Adaptive III) Laboratory	2
ME 500 Drawing Fundamentals	3
H&PE 509 Health Education	3
	15
Total Credit Hours	99

DEPARTMENT OF SPECIAL STUDIES

Instructor Foley.

ASSOCIATE IN ARTS PROGRAM

Instructor Foley (supervisor).

This program is designed for any student who seeks a liberal arts, two year academic program. Any candidate must complete a concentration in a field of his own choosing in the areas of social studies, the humanities or science. It is possible to transfer from this program to any undergraduate degree program so long as a student is in good academic standing and has earned sufficient academic credit hours in the Associate in Arts curriculum. The student must be ac-

cepted by the Dean of the School concerned.

Orientation 501, 502. *Study Skills.* These courses develop study skills which should aid academic achievement. Reading skills are developed with the use of reading improvement exercises and practice with reading machines and other visual aids. Study methods and habits are discussed and analyzed. 3 + 3 q.h.

First Year

First Quarter	Hrs.
*Orientation 501 Study Skills	3
Comm. 505 Basic Course I	3
H&PE Activity Course	1
Geog. 502 Principles of Geography or Geog. 519 Economic Geography or Math. 500 Algebra I or Math. 531 Mathematics of Business	5
	12

Second Quarter	Hrs.
*Orientation 502 Study Skills	3
Comm. 506 Basic Course II	3
H&PE 509 Health Education	3
Soc. Sci. 501 Introduction to Social Science	3
H&PE Activity Course	1
	13

Third Quarter	Hrs.
Psych. 501 Introduction to Psychology	3
Comm. 507 Basic Course III	3
Soc. Sci. 502 Introduction to Economics	3
Hist. 601 The United States I	3
H&PE Activity Course	1
	13

Fourth Quarter	Hrs.
Comm. 508 Basic Course IV	3
Soc. Sci. 503 Introduction to Political Science	3
Hist. 602 The United States II	3
Speech 515 Fundamentals of Speech or Speech 613 Public Speaking	3
	12

Second Year

Fifth Quarter	Hrs.
Hist. 603 The United States III	3
Philosophy or Religious Studies	3 or 4
Nat. Sci. or Science with Laboratory	3 or 4
Electives	3 or 6
	13 or 15

Sixth Quarter	Hrs.
Nat. Sci. or Science with Laboratory	3 or 4
Electives	11 or 12
	15

Seventh Quarter	Hrs.
Electives	15
Total Credit Hours	93 to 95

* A high school graduate with a less satisfactory high school scholastic record must take two quarters of Study Skills, 501–502 and his academic load will be limited. These courses may be waived for well prepared students by the advisor and appropriate electives substituted.

FOOD SERVICE TECHNOLOGY

502. *Nutrition.* The purpose of diet therapy and the policies and procedures for diet modification as it is delegated to a food service supervisor. Modified diet patterns in various types of group care institutions are considered. Three hours of lecture and four hours of laboratory per week. 5 q.h.

504. *Food Purchasing and Storage.* The study of quantity food purchasing policies and procedures; receiving and storage requirements, procedures and controls. Two hours of lecture and six hours of laboratory per week. 5 q.h.

605. *Organization, Management and Supervisory Techniques.* 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. Four hours of lecture and two hours of laboratory per week. 5 q.h.

606. *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. Three hours of lecture and four hours of laboratory per week. 5 q.h.

607. *Food Service Internship.* Experience in food production and service. Continuity in planning, preparing food and supervising units will be stressed. Group and individual conference periods will be conducted. 9 q.h.

608. *Planning Food Service Systems.* Study and practice of efficient work methods; activity analysis; planning, space and equipment arrangements for functional flow of work in food service department. Three hours of lecture and four hours of laboratory per week. 5 q.h.

650. *Food Service Seminar.* Trends and job opportunities in food service, community and other sources of information relating to nutrition and food service supervision. Two hours of lecture per week. 2 q.h.

First Year

First Quarter	Hrs.
Comm. 505 Basic Course I	3
Home Ec. 501 Food and Nutrition	3
Home Ec. 501L Food and Nutrition Laboratory	1

Chem. 505 Fundamentals of Chemistry	4
H&PE 509 Health Education	3
	14

Second Quarter	Hrs.
Comm. 506 Basic Course II	3
FST 502 Nutrition	5
FST 504 Food Purchasing and Storage	5
Chem. 506 Fundamentals of Chemistry	4
H&PE Activity Course	1
	18

Third Quarter	Hrs.
Comm. 507 Basic Course III	3
Home Ec. 601 Principles of Food Preparation	5
Nat. Sci. 622 Structure & Function of Man	5
H&PE Activity Course	1
Math. 531 Mathematics of Business	5
	19

Second Year

Fourth Quarter	Hrs.
Soc. Sci. 501 Introduction to Social Science	3
FST 605 Organization & Management	5
FST 606 Quantity Foods	5
H&PE Activity Course	1
Acctg. 601 Elementary Accounting I	3
	17

Fifth Quarter	Hrs.
Soc. Sci. 502 Introduction to Economics	3
FST 607 Food Service Internship	9
	12

Sixth Quarter	Hrs.
Soc. Sci. 503 Introduction to Political Science	3
Acctg. 602 Elementary Accounting II	3
FST 650 Food Service Seminar	2
FST 608 Planning Food Service Systems	5
Electives (Non-Technical)	3
	16

Total Credit Hours 96

DEPARTMENT OF NURSING

Assistant Professor DeCapita (chairman); Instructors Engelhardt, Goard, Gorton, Miller, Scheetz, Shields.

Advisement for the Undergraduate Degree Program for Registered Nurses is provided by the Sociology Department.

TWO-YEAR NURSING PROGRAM

The two-year program leading to the Associate in Applied Science Degree in Nursing provides a proportionate balance of general education and nursing courses. The North and South Units of the Youngstown Hospital Association, the Woodside Receiving Hospital, and other health agencies in the community are utilized for clinical laboratory experiences.

Graduates of this program will be eligible to take the Ohio licensing examination for registered nurses and will be prepared to give bedside nursing, to serve as staff nurses in hospitals and clinics, as private duty nurses, and in doctors' offices.

The Associate Degree Nursing Program has provisional approval by the Ohio State Board of Nursing Education and Nurse Registration and is a member of the Council of Associate Degree Programs of the National League for Nursing.

501. *Introduction to Nursing I.* Orientation of the student 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. Provides the principles and application of basic nursing skills. 5 q.h.

502. *Introduction to Nursing II.* The presentation and practice of more complex nursing skills with experience in patient care. Field visits to related health agencies. Prereq.: Nursing 501 with a grade of "C" or better. 5 q.h.

503. *Nursing Care of Adults and Children I.* Orientation to the processes of growth and development, the maintenance of health and the impact of illness upon individuals of all age groups. Practice of nursing care and field trips to related agencies. Prereq.: Nursing 502 with a grade of "C" or better. 8 q.h.

601. *Nursing Care of Adults and Children II.* Study of material health including factors affecting the developmental task of propagation of species. Physical and psychological problems of the handicapped individual. Clinical experience in maternal health, medical and surgical units, and field trips to related agencies. Prereq.: Nursing 503 with a grade of "C" or better. 10 q.h.

602. *Nursing Care of Adults and Children III.* The theory and practice of nursing and health care of patients with physical and/or mental illness with emphasis on the individual's biological and psychosocial reactions. Experience in clinical nursing units and field trips to related agencies. Prereq.: Nursing 503 with a grade of "C" or better. 10 q.h.

603. *Nursing Care of Adults and Children IV.* Major health problems encountered by children and adults including the biological and psychosocial effects of physical illness. Orientation to world health problems. Clinical experience in the care of patients of all age groups. Prereq.: Nursing 503 with a grade of "C" or better. 10 q.h.

613. *Role of the Registered Nurse.* A study of the roles 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, moral and ethical responsibilities of the nurse. Prereq.: Nursing 503 with a grade of "C" or better. 2 q.h.

First Year

First Quarter	Hrs.
Biol. 551 Functional Anatomy of the Human	4
Home Ec. 501 Food and Nutrition	3
Comm. 505 Basic Course I	3
Nurs. 501 Introduction to Nursing I	5
	15

Second Quarter	Hrs.
Biol. 552 Functional Anatomy of the Human	4
Soc. Sci. 501 Introduction to Social Science	3
Comm. 506 Basic Course II	3
Nurs. 502 Introduction to Nursing II	5
	15

Third Quarter	Hrs.
Biol. 560 Medical Microbiology for Nurses	5
Psych. 601 General Psychology	4
Nurs. 503 Nursing Care of Adults and Children I	8
	17

Second Year

Fourth Quarter	Hrs.
Biol. 530 Physical Science for Nurses	4
Comm. 507 Basic Course III	3
Nurs. 601 Nursing Care of Adults and Children II	10
	17

Fifth Quarter	Hrs.
Biol. 531 Physical Science for Nurses	4
Nurs. 602 Nursing Care of Adults and Children III	10
Electives (Art, Music, Philosophy, Economics, History, or Political Science)	3
	17

Sixth Quarter	Hrs.
Soc. 600 Principles of Sociology	5
Nurs. 603 Nursing Care of Adults and Children IV	10
Nurs. 613 Role of the Registered Nurse	2
	17
Total Credit Hours	96

In addition to the above requirements, the student may take one quarter hour of Physical Activity during any three quarters of the program.

DEPARTMENT OF POLICE SCIENCE TECHNOLOGY

Assistant Professors Foster (chairman), Boland, DeGarmo; Instructor Cress.

Youngstown State University offers two academic programs in law enforcement: a two year program, Police Science Technology, leading to the degree Associate in Arts; and, a four year program leading to the Bachelor of Arts degree with a major in Law Enforcement Administration. The Associate in Arts program is considered appropriate training for persons preparing for employment in most municipal, state and private law enforcement agencies.

501. *Introduction to Law Enforcement.* History of civil police powers, police department administration, laws affecting police powers and functions, professional ethics, and other topics relating to police functions in a democratic society. 3 q.h.

604. *Patrol and Field Operations.* Police logistics, surveillance, etc., with emphasis on techniques and functions of police patrol. 3 q.h.

605. *Criminal Justice.* The nature of the criminal act; the duty and power of the policeman in dealing with acts which later may be determined by courts to have been criminal; the authority of one person to deprive another of his freedom; procedural steps in determining that a person has committed a criminal act; the elements of particular crimes at common law and as charged by the statutes. 3 q.h.

610. *Principles of Criminal Investigation.* The fundamentals of crime investigation; the qualifications of the investigator; the crime scene search; the recording, collection, and preservation of physical evidence; the methods and techniques of interview and interrogation. Prereq.: PST 605. 3 q.h.

611. *Advanced Criminal Investigation.* The application of general techniques of investigation to specific areas, such as arson, narcotics violations, sex offenses, larceny, burglary, robbery, forgery, and homicide; the sources of information; testimony and courtroom procedure. Three hours of lecture and one hour of laboratory work per week. Prereq.: PST 610. 3 q.h.

612. *Criminal Identification.* A thorough presentation of the available means of identifying criminals including consideration of fingerprinting, observation and description, photography, handwriting, and trace evidence with stress on the practical application of identification principles in modern police work. Prereq.: PST 611. 3 q.h.

620. *Criminal Procedure.* Designed to give the student a basic understanding of criminal law and procedure, the laws of arrest, constitutional provisions relating to search and seizure, search warrants, habeas corpus, and the function and operation of the grand jury, by reviewing procedures from incident to final disposition. Prereq.: PST 605. 3 q.h.

621. *Evidence for the Patrolman.* 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.: PST 620. 3 q.h.

630. *Crime and Society.* Crime statistics; ecological, cultural and social patterns of criminal behavior; methods of treatment including probation and parole; crime prevention. 3 q.h.

631. *Delinquency Control.* Theories of delinquency causation; juvenile court; detention methods of treatment and prevention of delinquency; role of the police in delinquency control. 3 q.h.

640. *Police Supervision.* Police administration and organization as it relates to supervision; examination of various systems, the integration and coordination of all levels of supervision, inter-unit relationships, line of authority, and the duty and authority of various levels of command. 3 q.h.

641. *Police Skills.* Practice and theory of the use of technical equipment in law enforcement; fire-arm training; defensive tactics; safe, legal, and correct methods of stopping vehicles and apprehending offenders; police vehicle operation and equipment; communications. 2 q.h.

642. *Records and Reports.* Records in police administration; case and arrest records; personal identification records; uniform crime reporting; special analysis and studies; individual report writing; measuring results. 1 q.h.

650. *Traffic Law.* A study of the traffic laws of the various states with emphasis upon the laws of Ohio and adjacent states. 2 q.h.

652. *Traffic Accident Investigation.* Traffic accidents and their causes; legal responsibilities in connection with traffic accidents; acquiring, recording and evaluating the facts; hit-skip accidents; determination of speed from skid marks; statements, photography and measurements in accident investigation; civil aspects in police accident investigations. 3 q.h.

653. *Traffic Control.* A study of the engineering and mechanical features of traffic control with emphasis on techniques of traffic control; traffic control in emergencies; area control; point control; congestion relief. 3 q.h.

660. *Police Community Relations.* Application of sound public relations principles to the entire police operation. Consideration is given to press releases and press relations, community and minority group relations, civil rights, and the role of the police officer as he relates to human beings in conflict. 3 q.h.

First Year

First Quarter	Hrs.
Soc. Sci. 501 Introduction to Social Science	3
Comm. 505 Basic Course I	3
PST 501 Introduction to Law Enforcement	3
PST 650 Traffic Law	2
PST 642 Records and Reports	1
Electives (Science)	4
	16

Second Quarter	Hrs.
Soc Sci. 502 Introduction to Economics	3
Comm. 506 Basic Course II	3
PST 604 Patrol and Field Operations	3
PST 653 Traffic Control	3
Electives (Science)	4
	16

Third Quarter	Hrs.
Soc Sci. 503 Introduction to Political Science	3
Comm. 507 Basic Course III	3
PST 605 Criminal Justice	3
PST 652 Traffic Accident Investigation	3
Sec. St. 500 Typewriting for Beginners	3
	15

Second Year

Fourth Quarter	Hrs.
PST 610 Principles of Criminal Investigation	3
PST 660 Police Community Relations	3
PST 641 Police Skills	2
Soc. 600 Principles of Sociology	5
H. & P. E. 509 Health Education	3
H. & P. E. Activity Course	1
	17

Fifth Quarter	Hrs.
PST 611 Advanced Criminal Investigation	3
PST 620 Criminal Procedure	3
PST 630 Crime and Society	3
Psych. 601 General Psychology	4
H. & P. E. Activity Course	1
Electives (History, Sociology, Economics or Geography)	3
	17

Sixth Quarter	Hrs.
PST 621 Evidence for the Patrolman	3
PST 631 Delinquency Control	3
PST 640 Police Supervision	3
PST 612 Criminal Identification	3
Electives (Political Science)	3
H. & P. E. Activity Course	1
	16

Total Credit Hours 96

DEPARTMENT OF SECRETARIAL STUDIES

Associate Professor Turner (chairman); Instructors Ankeles, Boggess, Hille, Phillips, Powell, Sebestyen, and Walton.

The courses in 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.

A student who completes the 2-year program receives the Associate in Applied Business Degree, which should qualify him for employment in the majority of offices.

After completing the 2-year program, a student who wishes to complete a 4-year program may elect to take his last two years in (1) the School of Business Administration, receiving the Bachelor of Science in Business Administration Degree: or (2) the School of Education, receiving the Bachelor of Science in Education Degree. The first option would qualify him for high level administrative office positions, and the second, for certification for teaching Business Education subjects in secondary schools.

A suggested curriculum for Secretarial Studies majors is included following the course descriptions below. Candidates for the Associate in Applied Business Degree should complete the first 2 years of the curriculum, candidates for the Bachelor of Science in Business Administration Degree should complete the entire 4-year curriculum, candidates for the Bachelor of Science in Education Degree should consult the School of Education section of the catalogue.

Lower Division Courses

500. *Typewriting for Beginners.* The basic principles of touch typewriting. Students who take this course will add three quarter hours to degree requirements. 3 q.h.

504. *Shorthand for Beginners.* The fundamental principles of the Gregg system of shorthand are presented. (Students who take this course will add four quarter hours to degree requirements.) 4 q.h.

511. *Typewriting.* Application of typewriting skill to business problems with emphasis on techniques and speed building. Prereq.: Secretarial Studies 500 or equivalent. 3 q.h.

601. *Typewriting.* Advanced typewriting with emphasis on speed, accuracy, and refinement of techniques. Prereq.: Secretarial Studies 511 or equivalent. 3 q.h.

604, 605, 606. *Secretarial Accounting, I, II, III.* Designed to give students a foundation in the theory and practice of accounting principles as these principles apply to single proprietorship, partnership, and corporations. 3 + 3 + 3 q.h.

607–608. *Shorthand Dictation I–II.* Beginning dictation and transcription. A speed of sixty words a minute should be attained in the first course, and a speed of eighty words a minute in the second course. Prereq.: Secretarial Studies 500 and 504, or equivalent. 3 + 3 q.h.

610. *Production Typewriting.* Intensive drill for speed and accuracy on typewriting production problems. Prereq.: Secretarial Studies 511. 3 q.h.

617. *Business Machines I.* The operation of key-driven, rotary, printing, and electronic calculators with application to business problems 3 q.h.

618. *Business Machines II.* Building of skill in the operation of bookkeeping, transcribing, and duplicating machines and special typewriters. Prereq.: Secretarial Studies 601. 3 q.h.

Upper Division Courses

701. *Dictation and Transcription.* For increased speed and accuracy in transcription from shorthand notes. Prereq.: Secretarial Studies 511 and 608. 3 q.h.

702. *Shorthand Dictation III.* Emphasis on dictation speed, transcription accuracy, and vocabulary building. A speed of 100 words a minute in dictation should be attained. Prereq.: Secretarial Studies 608. 3 q.h.

703. *Shorthand Dictation IV.* Intensive drill on speed and accuracy in taking dictation and transcription. A dictation speed of 120 words a minute should be attained. Prereq.: Secretarial Studies 702. 3 q.h.

705. *Specialized Dictation.* Dictation and transcription in specialized fields: law, medicine, etc. Prereq.: Secretarial Studies 703. 3 q.h.

707, 708. *Business Law I, II.* The role of law in business. Case studies in contracts, agencies, negotiable instruments, bailments, sales, real and personal property, wills, partnerships, corporations, and insurance. 3 + 3 q.h.

709. *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. 5 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.: Secretarial Studies 604. 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.: Secretarial Studies 601. 3 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.: Social Science 503. 4 q.h.

803. *Office Practice.* Application of theory to practice: typical office problems and discussion of office procedures. Prereq.: Secretarial Studies 601. 3 q.h.

804. *Records and Records Management.* Fundamentals of record storage, retention, and management. Case studies and projects in various record systems in business. 2 q.h.

810. *Techniques in Teaching Typewriting.* Includes demonstration and practice of techniques of teaching typewriting with emphasis on the psychology of skill and currently accepted theories. Prereq.: Secretarial Studies 511 and junior standing. 1 q.h.

CURRICULUM

Suggested Curriculum leading to the Degree of Associate in Applied Business

First Year	Hrs.
Bus. Org. 511 Introduction to Business	3
Comm. 505, 506, 507 Basic Course I, II, III	9
Sec. St. 511, 601 Typewriting	6
Sec. St. 531 Mathematics of Business	5
Sec. St. 607, 608 Shorthand Dictation I, II	6
Sec. St. 617, 618 Business Machines I, II	6
Soc Sci. 501, 502, 503 Introduction I, II, III	9
H. & P. E. 509 Health Education	3
H. & P. E. activity courses	3
	50

Second Year	Hrs.
*Comm. 508 Basic Course IV	3
Psych. 601 General Psychology	4
Sec. St. 709 Business Communications	5
Sec. St. 610 Production Typewriting	3
Sec. St. 604, 605, 606 Secretarial Accounting I, II, III	9
Sec. St. 701 Dictation & Transcription	3
Sec. St. 702, 703 Shorthand Dictation III, IV	6
Sec. St. 803 Office Practice	3
Sec. St. 804 Records & Records Management	2
Sec. St. 707, 708 Business Law	6
*H. & P. E. activity courses	3
Electives	6
	53

A student who wishes to complete the 4-year course for the Degree of Bachelor of Science in Business Administration should complete the above curriculum. He should then transfer to the School of Business Administration and complete the following curriculum.

Third Year	Hrs.
**Acctg. 713 Basic Cost Accounting	4
Adv. PR. 627 Principles of Advertising I	3
Econ. 601, 602, 603 Principles of Economics I, II, III	9
English: any two 600-level literature courses	6
Hist. 601, 602, 603 The United States I, II, III or Hist. 651, 652, 653 Western Civilization I, II, III	9
Mdsg. 624 Marketing	5
Mdsg. 625 Salesmanship	3
Science electives	9
	48

Fourth Year	Hrs.
**Acctg. 810 Statement Analysis	3
Adv. PR. 710 Basic Public Relations	3
Bus. Org. 720 Business Finance	4
Bus. Org. 724 Credit Management	3
Bus. Org. 725 Fundamentals of Management	5
Bus. Org. 750 Human Behavior in Organization	4
Bus. Org. 804 Personnel Management	4
Business Organization elective (Upper Division)	2–4
Econ. 704 Economics and Social Statistics I	3
Mdsg. 709 Retail Marketing or Mdsg. 720 Industrial Marketing	3
Philosophy and Religious Studies elective or Humanities elective	4
Electives (Upper Division)	10–8
	48

DEPARTMENT OF CONTINUING EDUCATION

Associate Professor Looby (chairman).

Youngstown State University is interested in developing programs in Continuing Education to meet the full needs of the area it serves. The resources of the entire Uni-

* Not required for the degree of Associate in Applied Business.

** The student's qualifications for entering these courses will be determined by the Chairman of the Department of Accounting.

versity will be utilized in meetmg these needs. The coordination of all non-credit course offerings will be effected through the Department of Continuing Education. The activities that normally are included as a Continuing Education activity are conferences, short-courses, work-shops, and non-credit courses of any duration. Non-degree programs or courses designed to meet specific needs of individuals or industries will be offered as requirements are determined.

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KARL WASHBURN DYKEMA ..... *English*
JAY RODKEY ..... *Accounting*
GEORGE MILO WILCOX ..... *Education*

1960–1961

MARY WAGSTAFF JONES ..... *Communications*
MARGARITA MILLS ..... *Spanish*
EUGENE DODD SCUDDER ..... *Chemistry*
BERNARD JAMES YOZWIAK ..... *Mathematics*

1961–1962

GUS MAVRIGIAN ..... *Mathematics*
ALVIN MYEROVICH ..... *Music*
EDWARD THOMAS REILLY ..... *Business Organization*
CLAIR L. WORLEY ..... *Biology*

1962–1963

PAULINE ESTERHAY BOTTY ..... *Sociology*
FRANK ANGELO D'ISA ..... *Mechanical Engineering*
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WILLARD L. WEBSTER ..... *Biology*

1963–1964

DAVID MARION BEHEN ..... *History*
IRWIN COHEN ..... *Chemistry*
THADDEUS MICHAEL DILLON ..... *Mathematics*
GEORGE HENRY SCHOENHARD ..... *Education*

1964–1965

CHRISTINE RHOADES DYKEMA ..... *French*
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1965–1966

THOMAS D. Y. FOK ..... *Civil Engineering*
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