OHIO NORTHERN UNIVERSITY

Catalog Issue 1960-1961
THE GEORGE FRANKLIN AND SARAH CATHERINE GETTY
College of Liberal Arts
OSCAR G. DARLINGTON, Dean

DIVISIONS AND DEPARTMENTS

DIVISION I: HUMANITIES. (M. S. SCHMITZ, Division Head)
1) Art
2) English, Speech, and Theatre
3) Foreign Languages
4) Music
5) Philosophy and Religion

DIVISION II: NATURAL SCIENCES. (ANDREW STAUFFER, Division Head)
1) Biology
2) Chemistry
3) Mathematics
4) Physics

DIVISION III: SOCIAL SCIENCES. (W. E. BINKLEY, Division Head)
1) Economics and Business Administration
2) History and Political Science
3) Psychology and Sociology

Psychology not accepted as social science elective for teacher certification.

DIVISION IV: TEACHER EDUCATION. (HILDRED B. JONES, Division Head)
1) Elementary and Secondary Education
2) Industrial Arts
3) Physical Education
4) Public School Music
5) Public School Art

Course descriptions will be found in the departmental listings beginning on page 53.

OBJECTIVES

The objectives of the College of Liberal Arts are: to develop in each student a philosophy which gives meaning to life, apart from its material accomplishments; to cultivate comprehensiveness of thought; to
share in the intellectual achievements of mankind; to encourage critical thinking, continued reflection and re-examination of basic ideas and values; to develop skill in finding information and in evaluating such information so as to distinguish fact from opinion; to contribute to knowledge by research and by re-interpretation of the old in the light of the new.

Such a well-rounded, liberal education with stress on moral and spiritual values is designed to develop in the student poise and perspective with which to meet and evaluate life situations; to fit him for responsible citizenship; to give him a scholarly foundation for further study or professional training; and to afford him a rich and full personal life.

ADMISSION STANDARDS

In general, students of good character who show evidence of a capacity to profit by college experience and do the quality of work acceptable for graduation are admitted. To judge this each applicant for admission must be considered on his individual merits. Character, personality traits, attitudes, and desire for learning will be taken into consideration as well as the high school record.

Graduates of first-grade high schools, or the equivalent, and non-graduates with 15 acceptable units of high quality work and recommendation of the high school principal may be admitted. Applicants ranking low in their high school record may be admitted on the basis of the results of achievement and aptitude tests or upon presentation of other evidence of fitness for college work. Those deficient in entrance requirements for the work of their choice may make up the deficiencies to the extent of two units, by taking the work during their Freshman year either in college or from other agencies approved by the University.

Students admitted with advanced standing from other accredited colleges and universities must be in good academic standing with their parent institution at the time of their admission to Ohio Northern University, or must present to the Admissions Committee strong evidence of good character, adequate ability and well-defined motivation. Students transferring to the College of Liberal Arts from one of the other colleges within Ohio Northern University are also considered according to the above standard. In all such cases only grades of C or better are transferrable.

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COURSE OF STUDY

From the numerous offerings of courses a student may select special groups of studies of curricula which meet his needs, interests and abilities. The student should keep in mind that his later adjustment to changing conditions will depend largely on the insights and skills developed by a broad general education.

THE DEGREE OF BACHELOR OF ARTS

General and Advanced Courses. The curricula leading to the degree of Bachelor of Arts may be divided into two general divisions, general education and advanced education. The first two years are usually devoted to general education, presenting the courses which will furnish the foundation and background for advanced education. The advanced education will consist of the courses which presuppose the completion of the general education as necessary for successfully pursuing these studies. Work in the field of concentration is taken largely on the advanced level, together with advanced electives.

Prescribed: Certain courses are prescribed in the program of general education. These include English Composition, Speech, two one-year courses in two of the social sciences, Historical Study of Philosophy and Religion (or a one-year course in Philosophy or Religion upon approval), two one-year courses in two of the natural sciences, one full year of advanced work in English or American Literature, one quarter in Art, one quarter in Music, and two years of a foreign language. The extent to which transfer credits satisfy the requirements in a field shall be determined by the Dean of the College after consultation with the appropriate faculty.

The Field of Concentration. At the end of the second year the student is ready to choose, if he has not already done so, one division and the department within this division in which he desires to complete his field of concentration. For example, a prospective chemist would choose Division II – Natural Sciences, Department of Chemistry.

The candidate for a degree must complete in a logical sequence a field of concentration of not less than forty-five quarter hours. The adviser will assist the student in planning the field of concentration. Candidates for the degree of Bachelor of Arts who expect to teach in the public school must meet the professional education requirements as outlined on page 71.
The following departments offer fields of concentration toward the Bachelor of Arts degree in the College of Liberal Arts:

FIELDS OF CONCENTRATION

Art
Biology
Chemistry
Economics and Business Administration
English, Speech, and Theatre
Foreign Language
History and Political Science
Mathematics
Music
Philosophy and Religion
Physics
Sociology and Psychology

Sample Curriculum Plan

This is only a suggestion to illustrate the manner in which the prescribed courses, the field of concentration, and elective courses may be distributed in a four year plan of study leading to the degree of Bachelor of Arts.

FRESHMAN YEAR.
English Composition, C-1, 2, 3, or 131, 132, 133.
A year of Social Science.
A year of Natural Science.
A Foreign Language.
An elective (which may be chosen according to his objective, if the student has already chosen his objective).
Physical Education

SOPHOMORE YEAR.
Second Year of Natural Science.
Second year of Social Science or

*One course in the field of concentration.
American or English Literature.
Historical Study of Philosophy and Religion, C-31, 32, 33.
Quarter courses in Music, Art, Speech.
Physical Education.

*If the student has not chosen a major field by his Sophomore year, he may take a free elective here, then take an additional course in the field of concentration during either the Junior or Senior year in place of the free elective of that year — 45 quarter hours being considered a field of concentration.
THIRD YEAR.
Two courses in the field of concentration.
One course in the Division of his field of concentration, but not in the department.
One course outside the department of his field of concentration.
One free elective.

FOURTH YEAR.
Two courses in the field of concentration.
One course in the Division of the field of concentration, but not in the department.
One course outside the Division of the field of concentration.
A free elective.

To avoid too great a concentration on the major area this stipulation is made:
The student should have at least 120 quarter hours of work outside the department of his major. (This will permit 60 hours in the major field. Additional hours may be permitted in the major field if they are required for teacher certificate purposes.)

THE DEGREE OF
BACHELOR OF SCIENCE

The curricula of candidates for the degree of Bachelor of Science includes the courses prescribed for the degree of Bachelor of Arts, outlined on page 42 of this catalog. At the end of the first year, or at the latest the end of the second year, the student must choose the department within the natural science division in which he desires to complete his field of concentration. He shall secure, in writing, on standard Declaration of Major cards, the approval of that Department Chairman. The candidate for the Bachelor of Science degree shall complete in logical sequence the following:

1. The concentration of the requirements of the department.
2. A minimum of 80 quarter hours of work in the Division of Natural Science.

It is possible for a student to major in any natural science department under the Bachelor of Arts program. The degree of Bachelor of Science is designed to meet the needs of students planning to do graduate work in the natural sciences or preparing for industrial positions.
THE DEGREE OF
BACHELOR OF SCIENCE IN EDUCATION

The curricula of candidates for the degree of Bachelor of Science in Education meet the requirements of the State Department of Education for certification. The Chairman of the Department of Education and members of the department carefully advise the student in planning a schedule of courses to meet his goal.

The prescribed courses for the degree of Bachelor of Science in Education are: English Composition, one three-hour course in Speech, two one-year courses in two of the social studies (not psychology), one year of literature, either English or American, one quarter of Art, one quarter of Music, the Philosophy Core or nine hours of Bible, and a minimum of twelve quarter hours of natural science.

In view of the increasing interest in foreign language study in the elementary school, candidates for the B.S. in Education degree are advised to take at least one year in this field.

Elementary Education students major in Elementary Education. Secondary Education students complete their professional education courses and their chosen teaching field during their last two years. This should include a teaching major in at least one field under the direction of its department chairman, or a comprehensive major as defined by the State Department of Education in a broader field of concentration. Broader fields of concentration include: Business Education, Health and Physical Education, Industrial Arts, Music, Science, and Social Studies.

The Division of Teacher Education, in cooperation with the other divisions within the College of Liberal Arts, offers a program of education including the professional and educational course requirements leading to certification in the following fields:

1. ELEMENTARY EDUCATION

   a) Four-Year Degree Program. The Bachelor of Science degree in Elementary Education and a Provisional Elementary Certificate may be obtained by completing 180 quarter hours in courses that are appropriate for an elementary teacher.

   b) Two-Year Cadet Program. Cadet certification is permitted with two years of teacher preparation, provided the student maintains a 2.5 accumulative average throughout. To be eligible for such a certificate, the student must have completed ninety-three quarter hours of train-
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ing in the Elementary Teacher Education program. This Certificate may be renewed only upon evidence of the completion of thirty-six quarter hours of additional training applicable to the degree in Elementary Education.

2. PHYSICAL EDUCATION leading to a Provisional High School Certificate or a Provisional Special Certificate.

3. INDUSTRIAL ARTS EDUCATION leading to a major or minor in the field of Industrial Arts and qualification for the Four Year Provisional or Four Year Provisional Special Teaching Certificate.

4. PUBLIC SCHOOL MUSIC:
   a. Four year Provisional in Music
   b. Four year Special in Music

5. SECONDARY EDUCATION
   a. Art-Minor
   b. Biological Science
   c. English
   d. General Science, Physics, Chemistry
   e. History
   f. Languages: French, Spanish, German, Latin, Russian
   g. Mathematics
   h. Science (Comprehensive major)
   i. Social Science (Comprehensive major)
   j. Speech (including Theatre)

6. SECRETARIAL
   a. Special in Business Education
   b. Bookkeeping-Social Business
   c. Stenography-Typing
   d. Typing

Additional information about the teacher education program can be obtained from the Department of Education, Ohio Northern University, Ada, Ohio.

COMBINATION CURRICULA

Arts-Engineering

During the first three years the student is registered in the College of Liberal Arts and must secure a minimum of 145 quarter hours of credit. Upon the successful completion of the fourth year in the College of Engineering with a quality point average of two or better, and

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at least 45 quarter hours, the degree of Bachelor of Arts is granted. Upon fulfilling the requirements as specified in his selected engineering curriculum, the student will also be awarded the appropriate degree in engineering at the end of the fifth year.

Students entering with advanced credits from another college must be in residence three quarters (the third year) and complete a minimum of forty-five quarter hours in the College of Liberal Arts in this University.

Students entering the Arts-Engineering curriculum must conform to the rules and regulations of the College of Liberal Arts and the College of Engineering. By complying with these regulations, it will be possible for the student to secure both the degree of Bachelor of Arts and the appropriate engineering degree in five years. For the special fees pertaining to this combined program, see section on fees.

**ARTS-NURSING**

For the student who is preparing to enter a school of nursing the following program is suggested: The completion of three years of work at Ohio Northern and graduation from an accredited school of nursing. The University then awards the Bachelor’s degree.

Graduate nurses who complete this curriculum will also be awarded the Bachelor’s degree. Some modification of the curriculum may be made to fit their interests and objectives.

Arrangements have been made for a combined curriculum in Liberal Arts and Nursing with Memorial Hospital, Lima, Ohio. Students who elect this combination curriculum are expected to have those personal and social qualities which are essential to success in the field of nursing. This curriculum is of special interest to young women of northwestern Ohio.

**ARTS-LAW**

Beginning in the fall of 1960, an A.B. degree will be an admission requirement for all Ohio Colleges of Law, on the assumption that a broad liberal education is the best foundation for the study of Law.

It should be noted that a student admitted upon advanced credit from another college must be in residence three quarters and complete a minimum of forty-five quarter hours in the College of Liberal Arts in this University.

Students entering upon the Arts-Law curriculum must meet the regular entrance requirements and conform to the rules and regulations of the College of Liberal Arts.
ARTS-MEDICAL TECHNOLOGY

Students completing a two-year non-degree program meeting the requirements of the National Registry of Medical Technologists and administered by the Departments of Biology and Chemistry qualify for entry into an Approved School of Medical Technology.

Students completing a minimum of 135 quarter hours of work in the College of Liberal Arts, including all Division requirements and those requirements prescribed by the Departments of Biology and Chemistry for field of concentration, will be awarded the Bachelor's degree on presentation of evidence of registration as a Medical Technologist by the National Registry. The Departments of Biology and Chemistry allow one-fourth of the total number of credit hours required for a field of concentration (biology or chemistry) for work completed during the one-year internship required for registration.

Copies of the curricula outlined for these two programs may be secured from the Departments of Biology and Chemistry.

PRE-PROFESSIONAL CURRICULA

LEADING TO THE BACHELOR OF ARTS DEGREE

DENTISTRY AND MEDICINE

With a steadily increasing number of qualified applicants applying for admission to colleges of Dentistry and of Medicine, it is strongly recommended that the student looking forward to professional training in these fields plan to complete four years of undergraduate work with a high scholastic average. We offer curricula leading to the Bachelor of Arts degree which afford the appropriate foundation courses for later professional training in these professional fields.

Our counseling follows the recommendation of the many professional schools which advise a well-rounded Liberal Arts education with emphasis on social studies as well as on courses specifically preparatory to the study of medicine.

RELIGIOUS EDUCATION AND PRE-THEOLOGY

The suggested outline of studies which we offer will be found to meet the pre-professional requirements of theological schools. Many seminaries urge that the student have a thorough knowledge of the social sciences and include in their suggestions at least one natural science. This outline includes a broad and liberal course which will enable the student to appreciate his graduate studies to the fullest
extent. The courses given plus the emphasis throughout upon Christian idealism will bring about a realization of the most important aim of this department which is to produce for the world well equipped, spiritually-minded young men who will minister to the needs of their communities in every possible way.

FOREIGN AND PUBLIC SERVICE

The demand for well-prepared officials in the United States Foreign Service and in the Public Service of the federal and state governments is at the greatest peak in American peace-time history. To prepare for work in these fields a student should plan to continue with graduate education after receiving his degree of Bachelor of Arts. Ohio Northern University offers an inter-departmental concentration in International Relations and a departmental concentration in Political Science to prepare students for the Foreign Service and for Public Service. The Dean of the College of Liberal Arts should be consulted for the curricula outline in these fields.

GENERAL REGULATIONS

1. The student may not register for more than seventeen hours of academic work unless he has received a rating of "B" or better in the preceding quarter, in which case the Dean may grant permission for extra hours. A normal program consists of twelve to seventeen scheduled hours including physical education. Exceptions allowed above seventeen hours, on approval of the Dean of the College, include choir, band, or theatre workshop. All work below twelve or above seventeen hours is pro-rated at the rate of $17 per credit hour.

2. All new students in the College of Liberal Arts are required to take one quarter of Freshman Orientation. This is normally offered in the fall quarter.

3. The student indicates his choice of a major field of concentration by filling out a Declaration of Major card attainable in the office of the Dean of the college and secures the signature of the department chairman. The completed card indicates that the department accepts a student as a major. To change from one department to another, the student shall complete a Change of Major card, also attainable in the office of the Dean. A student is officially accepted as a major in a department only when he has completed the above procedure.
4. No course for which the student has received a "D" is acceptable toward a field of concentration.

5. Seniors taking courses in the "100" series in other than Foreign Languages or Mathematics must complete additional work of a high quality for full credit. Seniors selecting "100" courses should consult the Dean.

6. Juniors and seniors are required to schedule a majority of their courses from the "300" and "400" group.

7. Application for senior rating and graduation must be made to the Registrar during the third quarter of the junior year.

HOW COURSES ARE NUMBERED

Courses are numbered in "100", "200", "300" and "400" series. With the exception of students who have had special prerequisites, Freshmen may take courses only in the "100" series. Students of sophomore rank are not permitted to take "300" and "400" courses unless it is recommended by the advisor and allowed by the Dean of the college. Students of junior and senior rank are required to take a majority of their schedule among courses of "300" and "400" classification unless modification of this requirement is permitted by the Dean in an individual case upon the recommendation of the advisor.

The last digit of the course number designates the quarter in which the course is given: "1" indicates it is given in the Fall; "2" indicates a Winter Quarter course; and "3" indicates a Spring Quarter course. When a course ends in "0" it may be given any quarter.

The middle digit identifies the course in the series in the department.

A hyphen between course numbers indicates that the course must be taken in sequence, with all parts completed before full credit is allowed. A comma indicates that quarters can be taken separately out of sequence.

The college reserves the right to withdraw any course and to limit the number of students in any course.

CLASSIFICATION OF STUDENTS

For purposes of classification the minimum requirements for sophomore standing are thirty-eight quarter hours of academic work; for junior standing, eighty-four hours with all freshman and sophomore requirements completed; for senior standing, 130 credit hours.
WARNING AND PROBATION

A quality point average of 1.8 is required throughout the freshman year as the minimum level of satisfactory work.

A 1.9 accumulative is required for admission to sophomore rank on good standing and shall be the quality point average required for satisfactory standing throughout the sophomore year.

A 2.0 accumulative is required for admission to junior rank on good standing and shall be the quality point average for satisfactory standing throughout the junior and senior years.

Should a student’s point average for any quarter fall below that designated for satisfactory standing in that quarter, the student shall be placed on warning and shall remain on warning until his accumulative point average shall rise to the level required for satisfactory standing in that quarter.

Should a student on warning receive a quality point average for the quarter less than that stipulated for satisfactory standing in that quarter, he shall be placed on probation, not be permitted to represent the University in extra-curricular activities, and shall remain on probation until his accumulative quality point average shall rise to the level stipulated for satisfactory standing in that quarter.

A student who is on probation with his accumulative point average below that of satisfactory standing and who fails to make a quality point average in that quarter on probation, shall be considered for possible dismissal from the University.

Students admitted on probation with advanced standing may in individual cases be required to earn more than 2.0 in their first quarter at Ohio Northern University.

A student who has been on probation and returns to satisfactory status shall be placed directly on probation in any subsequent quarter in which his quality point average drops below the satisfactory level for that quarter.

A student placed on “strict probation” is required to report in person every two weeks to the office of the dean of the college until such time as he is removed from this classification.

SENIOR COMPREHENSIVE EXAMINATION

To assist each student to integrate his knowledge in his major field, and to test the overall quality and maturity of his work, a comprehensive examination covering the work in his major department shall be required of each student during the winter or spring quarter of his
senior year. He shall be examined by a committee of the faculty ap-
pointed by the Dean of the College in consultation with the depart-
ment chairman, and the committee shall include one member of the
faculty outside the division of the student’s major interest.

The examination can be a written or oral examination, or both, at
the discretion of the committee chairman, who is usually the chairman
of the student’s major department.

Students who pass this examination will have recorded on the official
transcript of their records the statement, “Passed (or passed with dis-
tinction) the senior comprehensive examination in ” Students
who fail will have nothing placed upon their transcripts. All students
will meet a reasonable time after the examination with the department
chairman who will go carefully over the strengths and weaknesses of
their examination.

GRADUATION

As a condition of graduation with the Bachelor’s degree, a student
must complete 180 quarter hours of academic work plus six hours of
chapel and six hours of physical education. The student must have a
cumulative qualitative point average of at least 2.0.

A residence period of the last three quarters and the completion of
at least forty-five quarter hours, with at least ninety quality points,
elected largely from “300” and “400” courses in the College of Liberal
Arts of this University are minimum requirements for a student ad-
mitted on advanced standing.

Students of unusual ability may, upon petition and with the ap-
proval of the Faculty of the College of Liberal Arts, complete their
work in less than twelve quarters. Applicants for this privilege should
have an average of 3.6 quality points per hour: high distinction rank.
No student, however, shall be allowed to graduate unless he has at
least eleven quarters work and has been in residence with Ohio North-
er University the last three quarters before graduation.

THE CORE COURSES

C-1-C-2-C-3. **ENGLISH COMPOSITION** 3 hours

These three quarters, constituting a year’s course for the freshman,
are designed to develop in the student the basic skills of writing and
speaking the English language. The three quarters are required of all
Freshmen.
C-31, C-32, C-33. Historical Study of Philosophy and Religion 3 hours
A study of religion and philosophy as a developing body of convictions by which man has attempted, in every age, to solve the problems and mysteries of life. A one-year unit of study designed and recommended for meeting the Philosophy-Religion requirements for graduation.

THE DEPARTMENTAL COURSES

Art

Assistant Professor West (Chairman), Mr. Fink

The department strives to develop within the student an appreciation of the fine arts. An introduction to the techniques involved with the media used in creative expression is presented as a necessary means to this end.

101-102-103. Art for Elementary Teachers 6–9 hours
The principles of design, color, lettering, and related problems in elementary school art. Planned for students majoring in elementary education. Lecture and labs.

111-112-113. Drawing 9 hours
The theory and practice of graphic expression in linear media. Perspective, composition, and aesthetic principles are stressed through specific problems. Laboratory.

121-122-123. Design 9 hours
The purpose of these is to present the theory and aesthetic application of the principles of 2 and 3 dimensional spatial organization in black and white and color as well as mass and line. Lecture and lab.

200. Introduction to Art 3 hours
This course is designed to meet the liberal arts requirement for one quarter's work in art. The course presents the students with the basic principles, problems, and pleasures of representative visual arts with emphasis on obtaining a basic understanding of the primary objectives of art. Lecture, slides and field trip. Schedule (1) discussion section.

201-202-203. History of Art 9 hours
A survey of art from pre-historic times to the present with emphasis on the development of art forms and how they affected or were affected by social problems and needs of their times. Illustrated lecture.
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221-222-223. Ceramics 9 hours
Basic techniques of forming and decorating clay bodies. Slab, coil, and wheel methods are presented. Lecture and laboratory.
Prerequisite: Design or Drawing, except Industrial Arts majors.

231-232-233. Painting 9 hours
Life, still life, and landscape painting in various media—oil, watercolor, casion, etc. Lectures and lab.
Prerequisite: Drawing, Design.

251-252-253. Sculpture 9 hours
Introductory course in 3 dimensional sculptural materials. Emphasis on concept and technique. Laboratory.
Prerequisite: Drawing, Design.

261-262. Lettering and Commercial Design 6 hours
The theory and application of typography in the production of posters, book jackets, trade marks, etc. Laboratory.
Prerequisite: Drawing, Design.

351-352. Printmaking 6 hours
Silk screen and woodcut. Problems and techniques of the printmaker. Lecture and laboratory.
Prerequisite: Drawing, Design, and permission.

361-362-363. Contemporary Trends 9 hours
Art History. Particularly the appearance and development of basic artistic expressions from the early 19th Century to the present.
Prerequisite: Art 200.

440. Special Art Problems 1–3 hours
Open only to advanced students. Permission of professor. Maximum credit, 12 hours.

Biology

Assoc. Prof. Bowden (Chairman), Prof. Stauffer, Prof. Huber,
Assoc. Prof. Pannabecker, Asst. Prof. Moody, Asst. Prof. Snyder

The aims of this Department are to enable the student to understand better the living world of which he is a part, to prepare for the teaching field, to obtain a biological foundation for the study of medicine, dentistry, nursing, and other professional courses requiring a knowledge of biology, and to qualify for admission to graduate work.
Students concentrating in Biology must complete a minimum of forty-five hours in this Department including Courses 111, 112, 113,
201, 202, 223, (331, 332) or (301, 302), 303, 402, 430, and 440. If graduate work is anticipated, students concentrating in Biology are expected to include at least a year of Chemistry, a year of Physics, Statistics, courses in Psychology and Sociology, and should have a reading knowledge of German and French.

111, 112-113. General Biology 12 hours
A study of some of the biological principles and concepts manifested in plant and animal life with considerable emphasis on their application to man. Discussion in the presence of laboratory materials, 5 hours.

121-122-123. Anatomy and Physiology for Nurses 9 hours (3 hours per quarter)
An introductory course designed to develop in the student an appreciation and understanding of the structure and function of the human body.

The laboratory includes dissection of a representative mammal and experiments illustrating physiological principles. Lecture, discussion, laboratory, 5 hours.

Nursing education students only.

201, 202. Botany 8 hours
These courses deal with some advanced concepts and principles concerning plant life. Special emphasis is given to the general classification, the life cycles, and the environmental relationships of representative members of the plant kingdom.

These courses are of fundamental importance to all students concentrating in biology and students who, from a cultural standpoint, wish to know something of the origin and development of plants. Discussions in the presence of laboratory materials, 5 hours.

Prerequisite: General Biology 111-113, or permission of the instructor.

213. Local Flora 3 hours
A systematic study of vascular plants, both native and introduced. A field course supplemented by greenhouse and herbarium studies. Field study emphasized. Lecture and class work, 1 hour; laboratory, 6 hours. Permission of instructor. (Formerly 110.)

223. Invertebrate Zoology 4 hours
A course dealing with a series of invertebrates. Discussion in the presence of laboratory materials, 5 hours.

Prerequisite: General Biology 111-113, or permission of the instructor.
301, 302, 303. Vertebrate Anatomy and Embryology 12 hours
Vertebrate anatomy consists of a comparative study which includes discussion and laboratory dissection of the different systems in representative forms. In embryology general principles of vertebrate development are discussed; laboratory study of certain vertebrate embryos illustrates the changes in form in the development of the adult organism.

The course is fundamentally important to biology majors and to students who expect to teach biology, study medicine, or who from a cultural standpoint, wish to know something of the origin and development of the human body. Lecture, discussion, laboratory, 8 hours.

Prerequisite: General Biology 111-113, or permission of the instructor.

311. Plant Anatomy 4 hours
A course dealing with the development and structure of the plant body. Lecture, discussion, laboratory, 6 hours.

Prerequisite: Botany 201, 202, or permission of the instructor.

312. Plant Physiology 4 hours
A critical study of some of the functional processes of Plants. Lecture, discussion, laboratory, 6 hours.

Prerequisite: Botany 201, 202, or permission of the instructor.

331, 332, 333. Physiology and Anatomy 12 hours
All sessions held in the Julius and Fannie Rogoff Laboratory of Physiology.

A course designed to develop in the student an appreciation and understanding of the structure and function of the human body.

The lectures include a few by guests who lecture in fields of their specialization.

The laboratory includes dissection of a representative mammal and experiments illustrating physiological principles. Lecture, discussion, laboratory, 6 hours.

Prerequisite: General Biology 111-113, or permission of the instructor.

402. Laboratory Technique 3 hours
Methods of collecting, killing, preserving, and preparing materials for demonstration and laboratory purposes are considered. A microscopic study of various plant and animal tissues is made. Lecture and class work, 1 hour; laboratory, 6 to 8 hours. Permission of instructor.
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423. Ecology 3 hours

A study of the general principles of bio-ecology. Field studies are emphasized.

Prerequisite: Botany 202, Invertebrate Zoology 223, or permission of the instructor.

450. Heredity 3 hours

A study of the principles of inheritance in plants and animals with considerable emphasis on human inheritance and the problems of eugenics. Lectures and discussions in the presence of hereditary materials.

Prerequisite: General Biology 111-113, or permission of the instructor.

433. Evolution 3 hours

A study of the development of the organic world, and an examination of the evidences of evolution and the theories attempting to explain the method of evolution.

Prerequisite: General Biology 111-113 and permission of the instructor.

440. Biological Problems 1—3 hours

Minor investigations for qualified Juniors and Seniors who are concentrating in Biology. By arrangement any quarter.

Chemistry

Associate Prof. Wright (Acting Chairman), Professor Randall, Assistant Professor Neveu, Mr. Lee, Mr. Griffith, Mrs. Wright

The objective of this department is to give thorough instruction in the fundamental principles and techniques of the science of chemistry, to furnish adequate preparation for those students who wish to do graduate study in chemistry, to give an introduction to and an appreciation of a natural science to liberal arts students in any field. A solid foundation in chemistry is also provided for those students who have need of chemistry in preparation for various related professional fields.

Students majoring in chemistry may choose their program according to two different options: (1) a program for those who intend to adopt chemistry as their profession or who plan to go to graduate school. This program is outlined in detail below. It satisfies the requirements of the American Chemical Society for an adequate undergraduate program in chemistry, (2) a program for those who do not desire or
cannot take as thorough a training in chemistry. However, a student wishing to concentrate in Chemistry under this latter option must complete the following courses: Chemistry 111-112-123, 211-212-213, 221-222-223, and 331-332-333.

**BASIC CURRICULUM FOR MAJORS IN CHEMISTRY**

**FRESHMAN YEAR**

Chemistry 111, 112, 123, General Chemistry and Qualitative Analysis 13 QTR. HOURS  
Mathematics 131, 132, 133, College Algebra and  
Trigonometry, Analytical Geometry, Calculus I 15  
English C-1, C-2, C-3 9  
Social Science Course 9  
Physical Education 3  
**TOTAL** 49

**SOPHOMORE YEAR**

Chemistry 221, 222, 223, Quantitative Analysis 12 QTR. HOURS  
Mathematics 221, 222, Calculus II and III 10  
Physics 241, 242, 243, General Physics 15  
English or American Literature 9  
Physical Education 3  
Elective 3 to 5  
**TOTAL** 52 to 54

**JUNIOR YEAR**

Chemistry 211, 212, 213, Organic Chemistry 12 QTR. HOURS  
Chemistry 331, 332, 333, Physical Chemistry 12  
German 101, 102, 103, Elem. German 12  
Philosophy C-31, C-32, C-33 9  
**TOTAL** 45

**SENIOR YEAR**

Chemistry 401, Chemical Literature 1 QTR. HOURS  
Chemistry 421, Organic Qualitative Analysis 3  
Advanced Chemistry Course, 400 series 6  
Physics 303, Modern Physics 3  
German 221, 222, 223, Scientific German 9  
Art, Music, Speech 9  
Elective in Social Science 9  
Other Electives 8  
**TOTAL** 48
Any course with a hyphenated number is planned as an integrated sequence. The first and second quarters are prerequisite for the second and third quarters respectively.

101-102. Chemistry for Nurses  
This course consists of a brief introduction to the major concepts of chemistry, the second quarter being devoted largely to a simplified treatment of organic chemistry with applications to biochemistry, designed to fulfill the needs of students of nursing. Three hours lecture and one two-hour laboratory period per week.

105. Introductory Chemistry  
(No credit for science majors)  
A course designed to furnish an understanding of the important principles and applications of chemistry in everyday living. The content of this course closely parallels Chemistry 101 with the exception of the laboratory. It does not prepare the student for advanced courses in chemistry. Three hours lecture per week.

111-112-113. General Chemistry  
This course constitutes a careful study of the fundamental laws of chemistry and of the common elements and their compounds; the mathematical approach is utilized with emphasis on the development of the scientific method of reasoning. The laboratory experiments are designed to illustrate the major concepts discussed. Designed primarily for students majoring in chemistry or other natural science, pre-engineering and pre-medical students. May be elected to fulfill a part of the requirements of the Division of Natural Sciences of the College of Liberal Arts. Chemistry majors and pre-pharmacy students take Chemistry 111, 112 and 128 as a one-year sequence. Three hours lecture and one three-hour laboratory per week.  
Prerequisite: 1 unit of high school algebra.

123. Elementary Qualitative Analysis  
A laboratory course in semi-micro qualitative analysis of acids, bases and salts, with emphasis on the salts of the common metallic elements. To be taken in lieu of Chemistry 118 by chemistry majors and pharmacy students and others who desire a more thorough course in qualitative analysis than that afforded by taking Chemistry 113. Three hours lecture and two three-hour laboratory periods per week.  
Prerequisite: Chemistry 112.

211-212-213. Organic Chemistry  
A beginning course in organic chemistry dealing with the chemistry
of the aliphatic, aromatic, and heterocyclic compounds of carbon. Some attention will be given to natural products and to the industrial and biological applications of organic chemistry. *Three hours lecture and one three-hour laboratory per week.*

**Prerequisite:** Chemistry 112.

**221-222-223. Quantitative Analysis** 12 hours

The study of standard methods of chemical analysis both volumetric and gravimetric, and of the chemical principles on which these methods are based. During the third quarter some work will be done on instrumental methods of analysis. *Two hours lecture and two three-hour laboratory periods per week.*

**Prerequisite:** Chemistry 113 or 123.

**331-332-333. Physical Chemistry** 12 hours

A beginning course in physical chemistry dealing with introductory thermodynamics, solutions, physical properties and molecular structure, chemical equilibria, chemical kinetics, electrochemistry, and colloid chemistry. *Lecture three hours, one three-hour laboratory period per week.*

**Prerequisite:** Chemistry 223, Physics 243, Mathematics 222.

**341-342-343. Elementary Biochemistry** 6 hours

Chemistry and metabolism of proteins, carbohydrates, lipids, other natural products, other compounds of medical significance, and of living tissues and biological fluids. *Lecture two hours per week.*

**Prerequisite:** Chemistry 213.

**401. Chemical Literature** 1 hour

A library problem course designed to provide the student with experience in the use of a scientific library. *Discussion, 1 hour per week.*

**Prerequisites:** Chemistry 213, 333.

**402. Advanced Inorganic Chemistry** 3 hours

A course devoted to the discussion of the chemical and physical properties of compounds of elements other than carbon with emphasis on those elements forming complex compounds. *Lecture 3 hours per week.*

**Prerequisites:** Chemistry 213, 333.

**411-412-413. Advanced Organic Chemistry** 6 hours

An advanced course involving the study of steric, inductive, and resonance effects in organic chemistry. There will be discussion of the
use of isotopes and chemical kinetics for the elucidation of mechanisms of organic reactions. **Lecture 2 hours per week.**

**Prerequisite:** Chemistry 213, 333.

421. **ORGANIC QUALITATIVE ANALYSIS** 3 hours

An introductory course in qualitative analysis of organic compounds, based primarily on solubility, class reactions, and the preparation of derivatives. **One hour recitation and 6 hours laboratory per week.**

**Prerequisite:** Chemistry 213, 223.

431-432-433. **ADVANCED PHYSICAL CHEMISTRY** 6 hours

An advanced course covering such selected topics as: x-rays and atomic spectra, molecular spectra, nuclear structure, quantum theory, photochemistry, and advanced topics in thermodynamics and chemical kinetics. **Lecture 2 hours per week.**

**Prerequisite:** Chemistry 333.

440. **CHEMISTRY PROBLEMS** 1–3 hours

Independent study of special topics in chemistry. Either a library study or a minor laboratory investigation. **Open to qualified seniors with the consent of the department chairman. By arrangement any quarter.**

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**Economics and Business Administration**

**ASSOCIATE PROFESSOR COOLEY (Chairman), ASSOCIATE PROFESSOR RITZ, ASSOCIATE PROFESSOR HIBBARD, ASSOCIATE PROFESSOR HUMPHREY, MR. STAUFFER AND SPECIAL LECTURERS.**

The aim of the Department is to develop a basic understanding of the market economy and to provide an opportunity to learn the fundamental techniques of business administration. All students should gain an understanding of basic economics, and those intending to enter business are advised to major in the Department.

Students majoring in the Department are required to take a minimum of 45 quarter hours within the Department. These must include Economics 201, 202, and 203, which are prerequisite to several advanced courses. Other required courses are: Economics 131, 132, 133, 181, 182, 283, 322, 352 and 353.
131-132-133. Principles of Accounting 9 hours
Fundamental process of accounting applied to service, trading and manufacturing concerns; preparation of working papers and financial statements from properly arranged accounts in general ledger; practice sets for representative business concerns completed. (Required of all Economics majors)

181-182. Mathematics of Finance 8 hours
(See Mathematics 181-182)

201-202-203. Principles of Economics 9 hours
A survey course with an analytic description of our economic system. An introduction is made to the price system, supply and demand factors, money and banking, the relation of government to the economy, the role of producers and consumers, and the analysis of income and employment. Current economic problems are analyzed. (Required of all Economics majors)

213. Business Organization 3 hours
A study of the various types of business and industrial organizations, both simple and complex. Throughout the course, emphasis is placed on recent trends in management, and methods required for administrative, managerial and industrial control.

222. Office Machines and Practice 3 hours
The purpose of this course is to learn to operate a variety of devices designed to handle the arithmetical work of the office. It includes instruction on listing and non-listing adding machines, registering, calculating and bookkeeping machines. A study will be made of the applications of the accounting machines, the punch card systems and the electronic computers.

283. Statistics 3 hours
(See Mathematics 283)

301. Intermediate Accounting 5 hours
General financial accounting theories with problem illustrations and applications. Classification of accounts, balance sheet forms, items and analysis of balance sheet, depreciation, goodwill, bonds and sinking funds, amortization, surpluses and reserves, statement of affairs, partnerships, and insurance.
Prerequisite: Economics 133.
312. COST ACCOUNTING  
Accounting for manufacturing enterprises with emphasis on job order process and standard costs accounting.  
*Prerequisite:* Economics 301.

322-323. BUSINESS LAW  
The first quarter, required of all economics majors, takes up the legal aspect of common business transactions involved in the making of contracts, the formation and legal results of agencies, the law governing the marketing of goods as it relates to personal property, and negotiable instruments. The second quarter, which includes the material in the former course in Labor Law, surveys labor legislation, setting forth the rights and responsibilities of employers and employees, and examining the public interest in labor disputes.

331. PRODUCTION CONTROL  
The principles and methods of planning and controlling the production of goods are studied. Procedures used in manufacturing establishments in the controlling of production operations, procurement, inventory, tools, loading, intra-company traffic and communication, design, mechanization and automation are analyzed.

332. TIME AND MOTION STUDY  
The theory and application of time and motion study techniques to the improvement of industrial operations. Process charts, fatigue, and relation of time standards to wage incentives are among the subjects studied.

333. QUALITY CONTROL  
The principles and methods of controlling the quality of materials, workmanship and inspection, as well as the procedures in establishing standards, tests and comparisons of products, are studied. The student is familiarized with the use of statistical quality control charts and acceptance sampling techniques as tools of scientific management.

341. LABOR ECONOMICS  
A study of labor as a factor in maximizing production, its use in relation to other factors, and its remuneration. The importance of a freely competitive labor market and of labor mobility are explained. Theories of the determination of wages, and bargaining theory are explored. The history and methods of labor unions, and government relations to labor, are given careful attention.
351. Marketing

The function of marketing in the economic system will be studied in its institutional aspects, its efficiencies, and its current trends of development. Government regulation of markets will be considered. The students will evaluate actual business problems on the basis of the principles covered in this course.

352-353. Money and Banking

A study of the organization and operation of American banking institutions. Includes theories of money and credit; commercial banking practices; reserve banking; monetary and banking laws; money market; money and credit in the world economy.

Prerequisite: Economics 201-202-203.

362. Corporation Finance

The issuance of corporation securities and their regulation will be related to the problems of fixed and working capital, income level, dividend policy and the use of borrowing. Case analysis will be used to consider the problems of expansion, recapitalization, and failure.

363. Personnel Management

A course analyzing the functions of the personnel department in industry, its development, and techniques. Text will be supplemented by case analysis of problems in selection, training, and incentives. The course is designed to broaden the student's appreciation of the human factor in industry.

371. Salesmanship

A study of the background, modern requirements and techniques of salesmanship, with controlled experience in actual selling in cooperation with neighboring businesses and industries.

372. Advertising

A general course for the benefit of those who aim to enter advertising, as well as a survey designed to teach what every business executive needs to know about the field. All types of advertising media are discussed. Both national and retail advertising are treated. The organization and administration of advertising departments and of advertising agencies receive emphasis.

373. Transportation

A study of the economics of transportation—waterway, railway, highway, pipeline, and air. The story of the development of transpor-
tation in the U.S. is reviewed. Rates and their effect on location and development of industry, government regulation, and labor relations are examined.

381. Federal Income Tax  5 hours
   Federal taxation and income tax reporting.

383. Intermediate Economic Theory  3 hours
   Advanced theory considering special problems of pricing, production, and distribution under perfect competition, oligopoly, duopoly and monopoly. An attempt is made to relate theory to practices in the American economy.

391. Business Communications  3 hours
   A study of the techniques of writing business letters and reports, including technical reports. The objective is efficient and accurate communication of economic and business facts and the writer's conclusions therefrom.

400. Economic Workshop  1–3 hours
   A special workshop on current economic problems, to be offered upon sufficient demand. Program of study subject to approval of the department chairman and credit to be granted according to university standards.

   No prerequisite. Consent of instructor is required.

403. Auditing  5 hours
   Principles and accepted procedures of auditing accounting records and statements, with special emphasis given to making of working papers and the writing of audit papers for making a complete audit.

411. Comparative Economic Systems  3 hours
   Critically evaluates capitalism, socialism, fascism, and communism as they touch on the economics of pricing, production and distribution. Welfare implications of each will be weighed against pure theoretical concepts.

413. Budgeting  5 hours
   Procedure for estimating income and expenses; the organization for controlling those expenditures and for measuring the operating efficiency of the organization.

   Prerequisite: Accounting 301.
421. **INTERNATIONAL ECONOMICS**  
3 hours  
This course studies both theories and actual current problems of trade between nations. Governmental restrictions and controls, such as tariffs, quotas and exchange controls, and the importance of multilateral trade are examined. Scarce resources, population, and employment trends are studied in relation to their bearing on world economics.

423. **PUBLIC FINANCE**  
3 hours  
A study of how the Federal government and local units of government finance themselves. Taxation in its many forms, the securities issued by government units, and the problem of management of the national debt of the United States are fully considered.

432. **GOVERNMENT REGULATION OF BUSINESS**  
3 hours  
It traces the history and development of government regulation of economic affairs in the United States. The provisions of the U. S. Constitution bearing on this subject, leading court opinions, and the more important regulatory laws of recent years are reviewed.

442-443. **HISTORY OF ECONOMIC THOUGHT**  
6 hours  
A critical analysis of the development of economic thought from Greek and Hebrew writers to modern economists. Particular emphasis given to the works of Adam Smith, Malthus, Ricardo, Marx, Marshall, Keynes and our modern American economists. Attention is given to the influence of environment and political thought. Text and original sources.

*Prerequisite:* Economics 203 or permission of the instructor.

452. **ADVANCED ACCOUNTING**  
5 hours  

*Prerequisite:* 311.

461. **INVESTMENTS**  
3 hours  
A practical study of the investment of savings. The course analyzes the many different investments available, such as common and preferred stocks, bonds of all types, building and loan shares, life insurance, real estate, etc. It evaluates each in terms of (1) safety of principal, and (2) return. Actual balance sheets of firms are analyzed from
the standpoint of investment desirability. How to gain information about investments, the processes of investing, and the operations of the securities markets are thoroughly discussed.

462. INSURANCE 3 hours
A course designed to acquaint the student with the general principles of insurance and their chief applications—life, health and disability, fire, casualty and marine. Corporate bonding, pensions and group insurance are studied. Actual insurance problems are presented by experienced operatives.

SECRETARIAL

101-102-103. Typewriting 9 hours
A series of courses designed to give the student a practical working knowledge of the typewriter combined with a study of the business letter, office forms, compositions, rough drafts, and tabulation. A high degree of accuracy and speed is required.

111-112-113. Shorthand 3 hours
Basic courses in Gregg Simplified Shorthand, designed to give the student a thorough foundation in principles, and practice in reading and writing at a satisfactory rate.

211-212. Shorthand and Transcription 3 hours
Advanced courses with emphasis on speed and accuracy in production. High degree of efficiency is required.
Prerequisite: Shorthand 113.

222. Office Machines and Practice 3 hours
Study and use of such office machines as dictaphone, mimeograph, and calculator. Theory and practice in office work both in class and laboratory. See Economics 222.

391. Business Communications 3 hours
See page 65.

223. Secretarial Practice 3 hours
A study of the secretarial profession with special emphasis on office mail, communication, travel, business reports, office organization, and the financial and legal duties of the secretary combined with the application of theory in a University office. Three class meetings and the clock hours of work experience each week.
Prerequisites: Shorthand 211, Typewriting 103, and Office Practice 222 or equivalents.
College of Liberal Arts

Education

Professor Jones (Chairman)
Professor Hanson
Professor Zaugg
Professor Jordon
Associate Professor Wehrer
Associate Professor Jacobs
Mr. MacNaughton

See pages 43-47 for description of curricula and degrees.

GENERAL COURSES

121-122-123. Introduction to Education 1 hour each
To give teachers a historical background of the development of American education and to help prospective teachers make intelligent decisions relating to their own qualifications in the various fields of teaching. The teaching profession; personal and social qualifications essential to good teaching; relative supply and demand in various fields. (Required of all students in the Division of Teacher Education.)

213. Educational Psychology 3 hours
A study of the learning process and conditions that promote learning.
Prerequisite: Psychology 202 or permission of the Instructor.

220. Observation 2 hours
Designed to aid prospective student teachers in observing classroom situations and evaluating learning conditions.

223. Child Development 3 hours
Characteristics of the child at different levels of maturity; physical, mental and emotional growth; growth and organization of meanings; control of social and ethical behavior; development of personality.
Prerequisite: Psychology 202 or permission of the Instructor.

310. Reading Improvement 3 hours
Promotes understanding of the Reading Process and provides experiences that aid in comprehension and speed through a study of basic reading skills; the mechanics of reading, causes of difficulties; prevention and treatment of individual problems, and evaluation of progress in reading.
College of Liberal Arts

360. Evaluation and Measurement of Pupil Progress 3 hours
A study of the basic problems of evaluation and measurement as they apply to instruction; construction of tests for use in the classroom and a survey of standardized tests and their uses.

400. Philosophy of Education 3 hours
A critical study of the conflicting theories of education, designed to help the student evaluate and make decisions in matters of instruction and classroom management.

401. Principles of Teaching 3 hours
Fundamental principles of teaching and learning. Attention is given to current trends in education; developing units of work; utilizing latent creative abilities; meeting individual needs; managing the daily program, evaluating pupil growth and development.

402. School Administration and Organization 3 hours
A course designed to present the scope and general character of the American public school system, its organization and administrative units and other agencies through which it is managed, and the administrative tasks for which a classroom teacher is responsible.

403. History of Education 3 hours
A study of the historical background of modern school theory and practice, stressing the developmental stages underlying American education.

410. National Systems of Education 3–6 hours
An investigation of the cultural attributes of the world’s foremost races and nations with special reference to the school systems responsible for some of the behavior differences of various peoples. An attempt to discover basis for better understanding and cooperation in the social and political realm. A review of international studies dealing with advances made on the elementary and secondary grade levels. A description of the great universities of the world and their contributions to a superior standard of living.

This course may include a “European Travel Seminar” sponsored by the University and conducted during the summer session. Conferences will be held with leading educators in the countries visited. The class will be guests of the various Ministries of Education, and under their direction will visit typical schools at all levels.

420. Curriculum Improvement 3 hours
Designed primarily for students who wish to work on individual and group problems growing out of their own school situations.
430. Audio-Visual Aids in Education 3 hours
A study of audio and visual materials and their uses in the promotion of the learning process.

440. Problems in Teacher Education 1–3 hours
This course provides for individual study, investigation, and research in the field of professional teacher education.

Bachelor of Science in Elementary Education
The course program as outlined below meets the requirements for the Bachelor of Science in Elementary Education and for the standard certificate in elementary education.

Four Year Elementary Program
(See also page 46 of this catalog)

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THIRD YEAR

FALL
- Teaching of Reading 241 3
- Philosophy and Religion C-31 3
- Social Studies Elective 3
- Elementary School Curriculum 301 3
- Elective 3

HOURS: 15

SPRING
- Philosophy and Religion C-33 3
- Social Studies Elective 3
- Philosophy of Education 400 3
- Electives 3
- Graphic Arts 331 3

HOURS: 15

WINTER
- Philosophy and Religion C-32 3
- Social Studies Elective 3

HOURS: 15

FOURTH YEAR

FALL
- Observation 220 2
- Social Studies Elective 3
- Teaching Language Arts & Social Studies 315 3
- Principles of Teaching 401 3
- Evaluation & Measurement 360 3
- Elective 1

HOURS: 15

WINTER
- Audio-Visual Aids 430 3
- School Administration 402 3
- Electives 9
- Student Teaching 380 9

HOURS: 21

A student must have a 2.0 accumulative average before taking student teaching.

In special cases, where the student plans to spend full time in a school, more than nine hours are permitted upon specific recommendation in writing by the Director of Teacher Education to the Dean of the college.

* (1) Does not apply toward 180 required hours for graduation.

TWO-YEAR ELEMENTARY CADET PROGRAM

(See also page 46 of this catalog)

The course program as outlined below meets the requirements for the Two-Year Elementary Cadet Program and for the provisional (cadet) elementary certificate.

Continuing in the Cadet Program for Elementary Teachers is contingent upon the maintenance of a 2.5 accumulative average. Students enrolled on the Two-Year Cadet Program will not be permitted to take student teaching on the job.

TWO-YEAR ELEMENTARY CADET PROGRAM

FIRST YEAR

FALL
- Physical Education 101 (1)*
- English Composition C-1 3
- Western Civilization 111 3
- Biology 111 or Chemistry 105 4

HOURS: 17 or 18

SPRING
- Art 101 2
- Introduction to Education 121 1
- Music 111 2
- Math 111 3

HOURS: 7
College of Liberal Arts

WINTER
Physical Education 102 (1)* 3
English Composition C-2 3
Western Civilization 112 3
Biology 111 or Chemistry 105 4
Art 102 2
Music 112 2
Health Education 122 3
Introduction to Education 122 1
17 or 18

SPRING
Physical Education 103 (1)* 3
English Composition C-3 3
Western Civilization 113 3
Physics 113 4
Art 103 2
Plays and Games 133 3
Music 113 2
Introduction to Education 123 1
18

SECOND YEAR
FALL
Physical Education 201 (1)* 3
Principles of Teaching 401 3
Teaching of Reading 241 3
U. S. History 211 or Am. Government 201 3
Teaching of Arithmetic 252 3
Children’s Literature 233 3
Speech 260 3
18

HOURS
Elementary School Curriculum 301 3
Handcrafts for Elem. Teacher 210 or Arts and Crafts 320 3
U. S. History 212 or Am. Government 202 3
Child Development 223 3
Teaching Language Arts and Social Studies 315 3
Science for Elementary Teacher 283 3
18

WINTER
Physical Education 202 (1)* 3
Student Teaching 380 9-15

A student must have a 2.5 accumulative average before taking student teaching.

In special cases, where the student plans to spend full time in a school, more than nine hours are permitted upon specific recommendation in writing by the Director of Teacher Education to the Dean of the college.

* (1) Does not apply toward 180 required hours for graduation.

ELEMENTARY EDUCATION COURSE DESCRIPTION

233. CHILDREN’S LITERATURE
A study of the best of literature for the elementary school children; the place of literature in the education of the child; principles involved in the teaching of literature with stress on its integration with other school activities.

241. TEACHING OF READING
Principles and techniques of teaching Reading in the elementary grades. Attention will be given to reading readiness, phonics, oral and silent reading, diagnostic and remedial measures, evaluation of textbooks and tests.

252. TEACHING ARITHMETIC
Methods and principles underlying the teaching of Arithmetic in the elementary grades; diagnosis and remedial work; preparation and evaluation of materials of instruction.

73
283. Science for the Elementary Teacher 3 hours
Content, methods and principles underlying the teaching of Science in the elementary grades. Special emphasis will be given to the organization and use of materials in the teaching of Elementary Science.

301. The Elementary School Curriculum 3 hours
Designed to help students develop learning situations in the classroom that are in harmony with basic psychological principles of learning with special emphasis on the objectives of elementary education.

315. Teaching of Language Arts and Social Studies 3–4 hours
Objectives, methods, materials, and evaluation in the teaching of elementary language arts and social studies. Emphasis is placed on developing units in social studies and helping pupils improve oral and written communication.

330. Kindergarten Methods and Materials 3 hours
A study of programs and practices in the kindergarten of four and five-year-olds. Open to advanced students in education and to cadets by special permission. Given upon sufficient demand.

340. Primary Methods and Materials 3 hours
Study of programs and practices in the primary grades required of all students who are candidates for the Kindergarten-Primary Certificate.

380. Student Teaching in the Elementary Grades 9–15 hours
The work consists of planning and teaching under supervision in the elementary grades. An integral part of Student Teaching is the seminar held on an average of once a week on the campus. Problems of mutual concern, procedures, acquaintanceship with pertinent literature and materials in the field comprise this phase of the program. The following prerequisites are required: (1) have a minimum scholarship rating of 2.5 quality points per scheduled hour for the Four-Year Elementary Program, (2) Approved by the Director of Teacher Education.

SECONDARY EDUCATION

The professional requirements for students in the field of secondary education are listed below:

121-122-123. Introduction to Education 1 hour each
(Required of all students in Division of Teacher Education)
350. Methods of Teaching in High School or Special Methods of Teaching in High School 3 hours

370. School and Society 3 hours

390. High School Curriculum 3 hours

433. Human Growth and Development 3 hours
   (Prerequisite: Psychology 202)

480. Student Teaching 9 hours
   ___________  24

Two electives from the following courses:

360. Evaluation & Measurement 3 hours

400. Philosophy of Education 3 hours

402. School Organization & Administration 3 hours

403. History of Education 3 hours

410. National Systems of Education 3–6 hours

430. Audio-Visual Aids 3 hours

440. Special Problems in Teacher Education 1–3 hours

__________  TOTAL 30

SECONDARY EDUCATION COURSE DESCRIPTION

350. Teaching Methods in the Secondary School 3 hours
   An analysis of the methods, devices, and techniques which are most effective in directing learning in the various subject areas at the high school level. Emphasis upon cooperative learning activities, understanding the student, the core curriculum, television in learning, instructional planning and other new developments in teaching practices.

351. Teaching of Business Education 3 hours
   To acquaint students with the functions of business education in the secondary school, and to help them acquire the techniques and methods necessary for the teaching of typewriting, shorthand, transcription, bookkeeping and social business in the high school.

352. Teaching of English 3 hours
   Effective devices and methods employed in teaching English in the high school; methods of teaching Literature, Grammar, oral English,
and Composition; evaluation and selection of textbooks, visual materials and library references; extra-curricular programs; objective tests. Winter

353. Teaching of History and Social Sciences 3 hours

Purposes and aims in the teaching of History and the Social Sciences; evaluation of integrated courses in the Social Sciences; selecting and organizing materials; methods of procedure; objective tests. Winter

354. Teaching of Mathematics 3 hours

Reorganization of Mathematics in secondary schools; evaluation of Arithmetic, Algebra, Geometry and unified Mathematics; selecting and organizing materials; objective tests. Fall

355. Teaching of Languages 3 hours

Work is adapted to meet the needs of students majoring in the different languages. Aims and methods of teaching languages; study of direct and indirect methods, recent trends; evaluation of textbooks; suggestions for projects; organizing language clubs; objective tests. Spring

356. Teaching of the Natural Sciences 3 hours

Designed for students who are preparing to teach one or more of the natural sciences. The work is adapted to meet the needs of the individual student. Selection and organization of subject matter; planning of laboratories; choice of equipment and textbooks; improvised equipment; selected projects in the different sciences; objective tests. Spring

357. Teaching of Speech 3 hours

Effective methods of teaching Speech in the elementary and secondary schools. Special attention is given to the place of speech in extra-curricular programs, debate, dramatics and radio. Fall

370. School and Society 3 hours

A study of schools in relation to their supporting society; the meaning of democracy in its relation to public schools; the responsibilities of educators to the community as well as to the school itself; the nature, type, and limitations of both the official and unofficial controls of the public school.

390. The High School Curriculum 3 hours

A study of secondary school curriculum practices, instructional materials, curriculum development, curriculum changes, and trends.

433. Human Growth and Development 3 hours

Required of secondary education majors. This is parallel to Edu-
cation 223 which is required of majors in elementary education. A study of the social and developmental factors underlying high school instruction.

*Prerequisite:* Psychology 202 or permission of Instructor.

450. **Driver Education** 3 hours

A course designed for those who plan to teach driving in the public schools. The course will consist of a number of classes and driving demonstrations daily. No other course can be taken concurrently. The credit will be approximately 11/2 hours per week of instruction.

480. **Student Teaching—Junior and Senior High Schools** 9 hours

To be eligible for student teaching the candidate must: (1) have senior rank; (2) have a minimum scholarship rating of 2 quality points per scheduled hour; (3) have completed courses in Educational Psychology, School and Society, and Special Methods; (4) teach either in his major or minor subject field; (5) be approved by the Director of Teacher Education.

The work consists of planning and teaching under supervision in the junior or senior high school, two hours of teaching daily plus an average of one hour per week conference with the supervisor on campus is required. A certain amount of classroom observation as determined by the department supervisor is necessary.

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**English, Speech, and Theatre**

**Associate Professor Price** (Chairman)

**Associate Professor Hastings**

**Assistant Professor Bennett, Assistant Professor Higgins**

**Assistant Professor Crawford, Assistant Professor Smith**

**Assistant Professor Shields**

Mr. Sabol, Miss Gerdes, Mr. Kelleher, Mrs. Spelman, Miss Leach

**Objectives**

The courses in *Language, Literature, Speech,* and *Theatre* are designed (1) to develop the student's skill in writing and in oral communication so that he may express his ideas clearly and effectively and thus better participate as an active member in a democratic community; (2) to give the student a knowledge of literature so that he may read with critical ability, understanding, and appreciation; (3) to give the student a fundamental knowledge and understanding of the nature of language; (4) to provide the opportunity for the student to experience a variety of speech and theatre activities which may make a direct
contribution to satisfactory living; (5) to offer advanced work to those who plan to teach in the public schools and to those who plan to continue specialization in graduate study.

CLASSIFICATION OF COURSES

Classification of courses within the department is shown by the middle digit of the course number: 0-3, Literature; 4-5, Language; 6-7, Speech; 8-9, Theatre. For example, 322 is a Literature course, 253 is a Language course, 371 is a Speech course, 483 is a Theatre course, and so forth.

FIELDS OF CONCENTRATION

The Department of English, Speech, and Theatre offers three fields of concentration, as follows:

General Requirements: Of the required number of hours for the concentration at least eighteen must be from the Language and Literature classification and at least twenty-seven must be on the 300-400 level. All three concentrations require two years of a modern foreign language (two years in high school being considered the equivalent of one year in college). The English Composition sequence (C-1, 2, 3), Literature and Writing (131-2-3), Basic Speech (S-1, 2, 3), and Theatre Workshop (280) do not count toward a concentration. No course with a grade below C may be counted toward a concentration.

English: For a field of concentration in English, the following courses are required: English 201 (Introduction to English Literature); Speech 262 (Oral Interpretation); English 311, 312, 313 (Shakespeare); English 322 (Chaucer); and English 351, 352 (Language Study). English 323 (Milton) may be substituted for English 201, on approval of the Department Chairman. Additional courses in the Language and Literature classifications must be selected to complete a minimum of forty-eight hours. In addition to the forty-eight hours within the department, two years of either French or German and one year of English History are required.

Speech: For a field of concentration in Speech, the following courses are required: Speech 271 (Elements of Speech); English 331, 332, 333 (The Drama); English 351, 352 (Language Study); Speech 371 (Debate); Speech 372 (Advanced Public Speaking); and Speech 373 (Discussion). Additional courses must be selected from the departmental offerings to complete at least eighteen hours in the Language and Literature classifications and at least twenty-seven hours in the Speech
classification. In addition to the forty-five hours within the department, two years of a modern foreign language are required.

Theatre: For a field of concentration in Theatre, the following courses are required: Theatre 291, 292, 293 (Introduction to Theatre, Theatre History); Theatre 381, 382, 383 (Theatre Techniques); and Theatre 481, 482, 483 (Play Production). Additional courses must be selected from the departmental offerings to complete forty-five hours in Theatre and Speech; of these forty-five hours, at least twenty-seven must be in Theatre (the remaining eighteen hours may be in either Theatre or Speech). In addition to the forty-five hours of the concentration, nine hours of dramatic literature beyond the liberal arts general literature requirement and two years of a modern foreign language are required.

ENGLISH COURSES

C-1-C-2-C-3. COMPOSITION 9 hours

These three quarters, constituting a year's work for the freshman, are designed to develop the student's skill in writing. All three quarters are required for graduation, except as follows: On recommendation of his instructor and approval of the Director of Freshman English or Department Chairman, a student with a grade of A in English C-1 may substitute three hours of Creative Writing (English 340) or three hours of Literature and Writing (English 131-2-3) for English C-2.

Students beyond their first year of college must fulfill assignments in addition to the regular work in order to receive credit for this freshman course.

Prerequisites: A grade of C or better in English C-1 is prerequisite for English C-2; a grade of C or better in both English C-1 and English C-2 is prerequisite for English C-3 (except as noted above). It is not permissible to take two terms' work concurrently.

131, 132, 133. LITERATURE AND WRITING 9 hours

In this course the primary emphasis is on literature; secondary emphasis is on writing based on or growing out of the reading. Attention is also given to the principles of style and the fundamentals of grammar and mechanics, the nature and amount depending on the needs of the individual student and of the class as a whole. Entering freshmen scoring high on a placement test are assigned to this course instead of to English C-1-2-3. On recommendation of the dean of the college, other students whose test scores qualify them may also be placed in this course. Credit hours in English 131-2-3 count toward the university requirement of nine hours of freshman English. Sophomores
who have completed their freshman English requirement may also enroll in English 131-2-3 as an elective.

201, 202, 203. Introduction to English Literature 9 hours
In these three quarters some of the principal works of the major English writers are studied. English 201 is required for a concentration in English (unless English 323 is substituted).

211, 212, 213. American Literature 9 hours
In these three quarters some of the principal works of the major American writers are studied.

241-242-243. Journalism 6–9 hours
This is a practical course providing basic instruction in newspaper organization, procedures, and techniques. Students work closely with or are members of the staff of the Northern Review. Credit is three hours per quarter for students who participate in the laboratory held on alternate Sunday afternoons at the printer’s, two hours for those who do not.

253. Vocabulary Study 3 hours
This course consists of a systematic study of English vocabulary with a view both to enlarging and enriching the student’s store of words and to developing his precise and effective use of them.

301, 302, 303. The Novel 9 hours
In this study of the development of the novel from the eighteenth century to the present, some of the more significant works of the major novelists are read and analyzed.

311-312-313. Shakespeare 9 hours
The early comedies and histories are studied in the first quarter, and some attention is also given to the poet’s life and the medium in which he worked. In the second quarter the sonnets, the later histories, the early tragedies, and the foremost comedies are treated. In the final quarter the realistic comedies, the later tragedies, and the dramatic romances are studied. All three quarters are required for a concentration in English.

Prerequisites: English 311 or consent of the Instructor for 312; English 312 or consent of the Instructor for 313.

320. The Short Story 3 hours
A number of the works of the master short story writers are read and studied. Particular emphasis is placed on acquiring an understanding and appreciation of the short story as a literary form, its tech-
niques, and its advantages and limitations as a means of artistic expression.

322. Chaucer 3 hours
   *The Canterbury Tales* and some of the shorter poems are read. The
tingual, social, and historical backgrounds of the poems are also
treated. English 322 is required for a concentration in English.

323. Milton 3 hours
   *Paradise Lost* is studied in detail. *Paradise Regained, Samson Agonistes,*
   and the minor poems are treated as fully as time will allow.

331-332-333. The Drama 9 hours
   In the first quarter the student is introduced to the aims and special
techniques and characteristics of the drama as an art form. Illustrative
plays are studied, beginning with simpler and progressing during the
year to more mature types, with emphasis in the third quarter on plays
in the more complex tragic mode. Most of the plays studied are from
the modern theatre. All three quarters are required for a concentra-
tion in Speech.

*Prerequisites:* English 331 or consent of the Instructor for 332; Eng-
lish 332 or consent of the Instructor for 333.

340. Creative Writing 3 hours
   In this course students are encouraged to discover and develop their
abilities in imaginative and personal writing—verse, fiction, plays,
shorts—by means of individually directed study of and self-expression
in these forms. Writing is supplemented by class discussion and private
conferences with the Instructor.

Enrollment is limited and admission is only with approval of the
Instructor. A maximum of nine hours of credit is permitted.

350. College Grammar 3 hours
   This is an intensive study of descriptive English which includes dia-
gramming. It is recommended, in conjunction with English 351 and
352, for prospective teachers of English. (Offered on sufficient demand)

351-352. Language Study 6 hours
   This is an introductory study from a scientific viewpoint of the pro-
nunciation, grammar, and vocabulary of the English language. Part-
icular emphasis is on modern English and the American dialects.
English 351 and 352 are required for a concentration in English or in
Speech.

*Prerequisites:* English 351 or consent of the Instructor for 352.
401, 402, 403. World Literature 9 hours
In the first quarter the masterpieces of Greek and Roman writers are studied. In the second quarter some of the principal works of the major Italian, Spanish, German, and French writers from the Middle Ages to the middle of the eighteenth century are treated. Some of the principal works of the major German, French, Norwegian, and Russian writers from the middle of the eighteenth century to the present day are studied in the final quarter. All works are read in English translation. (Offered on sufficient demand)

440. Seminar: Language and Literature 1–3 hours
Qualified seniors concentrating in English may undertake an individual research project supervised by a member of the department. A maximum of three hours of credit is permitted.

Prerequisites: English C-3 at this University or approval by the Department Chairman upon special recommendation by the member of the department who will supervise the project.

SPEECH COURSES

160. Speech Improvement 3 hours
Materials are developed for the individual to aid students with personal articulation, voice, rhythm, hearing, or symbol problems.

Prerequisites: Admission by consent of the Instructor.

260. Speech Re-Education 3 hours
The first course of a possible two-unit sequence devoted to the study of speech disorders; the materials of this unit are developed from the point of view of the elementary and secondary school teacher.

261. Voice and Diction 3 hours

262. Oral Interpretation 3 hours
The development of expressive and modulated individual speech is stressed; the literature of and for personal expression is studied. Speech 262 is required for a concentration in English.

Prerequisites: Speech 261 or consent of the Instructor for 262.

271. Elements of Speech 3 hours
272. Public Speaking I 3 hours
273. Public Speaking II 3 hours
The nature and philosophy of oral communication in the various areas of speech are explored; the principles and practices of public speaking in contemporary life are developed and executed. Speech 271 is required for a concentration in Speech.
Prerequisites: Speech 271 or the equivalent for 272; Speech 272 or the equivalent for 273.

360. Advanced Speech Re-Education 3 hours
The work of Speech 260 is continued with further exploration of the nature and rehabilitation of speech disorders; and opportunity is presented for each student to assist with a clinical problem.
Prerequisites: Speech 260 or the equivalent for Speech 360.

371. Debate 3 hours
372. Advanced Public Speaking 3 hours
373. Discussion 3 hours
The function and place of public debate, public speaking, and public discussion in a democratic society are examined; opportunities for intercollegiate participation in the various areas are presented. Speech 371, 372, and 373 are required for a concentration in Speech.

470. Seminar: Speech 1–3 hours
Qualified seniors concentrating in Speech may undertake an individual research project supervised by a member of the department. A maximum of three hours of credit is permitted.
Prerequisites: English C-3 at this University or approval by the Department Chairman upon special recommendation by the member of the department who will supervise the project.

THEATRE COURSES

280. Theatre Workshop 1 hour
The work of the sequence is directly related to the production schedule of the Northern Players and Theta Alpha Phi. A maximum of six hours of credit is permitted.

283. Acting Fundamentals 3 hours
This course is designed to follow the two vocal expression courses, Speech 261 (Voice and Diction) and Speech 262 (Oral Interpretation), with the addition of physical expression through movement and gesture. The basic theories and techniques of acting and makeup also are explored, with emphasis upon individual growth.
Prerequisites: Speech 261 and 262 or consent of the Instructor.

290. Radio Workshop 1 hour
The work of the sequence is directly related to the current University radio and television programs. A maximum of six hours of credit is permitted.
291. INTRODUCTION TO THEATRE
An audience centered survey of theatrical theories and techniques designed to aid the student in establishing high standards of judgment and criticism in all aspects of production in the three primary dramatic mediums (theatre, cinema, television). Each aspect of the theatre experience will be analyzed with more complete enjoyment and appreciation through better understanding as the primary goal. Theatre 291 is required for a concentration in Theatre. (This course counts toward the Liberal Arts requirement of two quarters in Art, Music, and Theatre.)

292, 293. THEATRE HISTORY
A history of the Theatre from its beginnings in primitive man to the present. Primary emphasis will be on the development of the physical theatre, with secondary emphasis on the plays evolving from each period. The first term will cover the periods from the beginnings to the eighteenth century, the second term from the eighteenth century to the present, with attention also to the oriental theatre. Each term is a self-contained unit, though both are recommended if full value is to be acquired. Theatre 292 and 293 are required for a concentration in Theatre.

381, 382, 383. THEATRE TECHNIQUES
The first unit presents the basic considerations for good directing; the second unit is devoted to stagecraft; the third unit presents the fundamentals of design. Theatre 381, 382, and 383 are required for a concentration in Theatre.

Prerequisites: Theatre 381 or consent of the Instructor for 382; Theatre 382 or consent of the Instructor for 383.

391. ADVANCED DICTION AND DIALECTS
This course is designed to develop a high standard of competence in the use of the spoken English language and to develop the necessary vocal flexibility for dialect, verse, and period drama.

Prerequisites: Theatre 283 or consent of the Instructor.

392. CHARACTERIZATION DEVELOPMENT
This course presents a detailed study of the theory of acting. Emphasis is upon the development of depth and insight into individual characterizations chosen from the world's great dramatic literature.

Prerequisites: Theatre 391 or consent of the Instructor.

393. STYLES AND PERIODS
This course comprises a thorough study of style and period in act-
ing. Emphasis is on ensemble performance.

**Prerequisites**: Theatre 392 or consent of the Instructor.

**480. Seminar: Theatre**

1–3 hours

Qualified seniors concentrating in Theatre may undertake an individual research project supervised by a member of the department. A maximum of three hours of credit is permitted.

**Prerequisites**: English C-3 at this University or approval by the Department Chairman upon special recommendation by the member of the department who will supervise the project.

**481-482-483. Play Production**

9 hours

Unit one of this sequence considers the elements of expressive design in settings, lights, costumes, and movement; unit two provides advanced work in the theories and techniques of directing; unit three develops the many-faceted duties and responsibilities of the producer-director. Theatre 481, 482, and 483 are required for a concentration in Theatre.

**Prerequisites**: Theatre 381, 382, and 383 or the equivalent for 481; Theatre 481 for 482; Theatre 482 for 483.

**490. Theatre Projects**

1–9 hours

The purpose of a theatre project is to give advanced training in an area of special interest or need to senior students concentrating in Theatre. The five areas and their prerequisites are as follows:

1. **Design**: **prerequisite**: Theatre 381-2-3 or the equivalent.
2. **Directing**: **prerequisite**: Theatre 381-2-3 or the equivalent.
3. **Acting**: **prerequisite**: Speech 261-2 and Theatre 283 or the equivalent.
4. **History and/or Criticism**: **prerequisite**: Theatre 291-2-3 or English 351-2-3 or the equivalent.
5. **Playwriting**: **prerequisite**: Theatre 291 or the equivalent.

Permission of the instructor must be obtained for any project. The choice of area, scope of project, and credit to be earned will be determined in conference with the Director of Theatre. The student must have demonstrated to the satisfaction of the Director of Theatre, through participation in the theatre program, his ability to complete the proposed project. Upperclassmen who are not concentrating in Theatre but who meet the prerequisites may elect a project by obtaining permission of the Department Chairman and the Director of Theatre.

A maximum of nine quarter hours is permitted, with not more than six hours in any one quarter.
Foreign Languages

PROFESSOR SCHMITZ (Chairman), ASSISTANT PROFESSOR ANDRUSIAK,
ASSISTANT PROFESSOR GMINDER, ASSISTANT PROFESSOR SEPIANU,
ASSISTANT PROFESSOR TSAMBASSIS

The ultimate educational value of knowing foreign languages and literatures is that it helps the student to cultivate a greater breadth and comprehensiveness of thought, to arrive at a more thorough understanding of a foreign culture, and to lead to a deeper knowledge of the English language and the American cultural heritage.

The various courses in French, German, Spanish, Italian, and Russian are designed to meet both practical and cultural needs, promoting proficiency in understanding, speaking, reading and writing the foreign language. Emphasis is placed on a comprehension of the spoken language and the development of a speaking knowledge. All courses are conducted for the most part in the foreign language, and lectures, discussions and written work in the majority of the courses are carried on in the foreign language, so that linguistic proficiency may be acquired along with the study of literature. The department considers a thorough mastery of the language as the indispensable basis for an objective, intelligent, and significant understanding and interpretation of literature.

The Thomas R. Schoonover Laboratory (with native assistants, master-tapes, pre-recorded tapes and discs) provides opportunities for practice with tape recorders in 24 semi-soundproof booths, and extends the contact of the student with a LIVING language, aiming at a maximum of active participation; offering recorded materials which have been carefully prepared as an adjunct to class work, interrelated and coordinated with class instruction; rendering ample opportunity for aural comprehension, auditory-visual drill, speaking, simultaneous and consecutive interpreting, and self-correction.

Elementary and intermediate courses in French, German, Spanish, Italian, and Russian may be counted as Upper Division courses if taken during the junior or senior year. Courses conducted entirely in English cannot be counted toward the major.

Students with two years of high school preparation in a foreign language should begin with an intermediate course; those with more than two years should take a placement examination, and may be permitted to take a 300 level course, if approved by the head of the foreign language department.

Requirements for a major in foreign languages:

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Prerequisite: Course 101-103 or two units of high school instruction in foreign languages.

Major: 36 hours

Students desiring to take a field of concentration in foreign languages should arrange details with the Chairman of the Department of Foreign Languages.

FRENCH

101-102-103. Elementary French 4 hours

The aim is to develop the ability to understand, speak, read, and write French. Stress on functional, rather than formal grammar. Special emphasis on early and fluent speaking. Elementary reading based on French life, customs and manners. Three hours of class and two scheduled laboratory practices a week.

201-202-203. Intermediate French 4 hours

A systematic review of fundamentals of grammar and pronunciation. Abundant conversational practice and composition based on short stories, plays and poetry. Occasional lectures on French life, history, architecture, art and civilization. Regular use made of film strips, slides and motion pictures with French sound tracks. Three class periods and two scheduled laboratory practices a week.

Prerequisite: 101-103, or two years of high school instruction in French.

301-302-303. Advanced French Conversation and Composition 4 hours

Based on a wide range of topics dealing with France and the French-speaking peoples. The aim is to develop both a useful command of the language and an appreciation of French civilization. Recorded conversational dialogues on a variety of topics useful to the student or traveler in France, films and slides, and current French periodicals are used and discussed. Three class periods and two hours of scheduled laboratory.

Prerequisite: French 201-203.

311-312-313. Survey of French Literature 3 hours

A study of the main currents and characteristic monuments of French literature. Class discussions based on the reading of representative French masterpieces. Lectures and reports.

Prerequisite: French 201-203, 301-303.
321-322-323. NINETEENTH CENTURY FRENCH LITERATURE 3 hours
A study of the main literary currents in the nineteenth century, including Romanticism, Realism, Naturalism, Symbolism, etc. through an analysis of typical and selected texts.
Prerequisite: French 201-203, 311-312.

331-332-333. HISTORY OF FRENCH CIVILIZATION 3 hours
Conducted in English. Open to all upper-classmen.
General survey of the development of French civilization from the Roman conquest to modern times. The political, artistic, literary, and scientific activities of the French people in the formation of their national life and their contribution to human progress.
No prerequisite.

341-342-343. LITERATURE OF THE FRENCH RENAISSANCE 3 hours
Conducted in English.
Villon, the Pleiads, Rabelais, and Montaigne.
Open to juniors and seniors who do not read French.
Class work and reading in English.

351-352-353. EIGHTEENTH CENTURY FRENCH LITERATURE 3 hours
Conducted in English.
French thought as reflected in the works of Montesquieu, Voltaire, Rousseau, and Beaumarchais.
Open to juniors and seniors who do not read French.

401-402-403. CIVILIZATION FRANCAISE 3 hours
A survey of the history of France, its topography, industries, government, educational system, journalism, etc.
The course, given entirely in French, is required of all French majors.

440. FRENCH SEMINAR 3 hours
For seniors majoring in French. May be repeated up to 6 hours.

GERMAN

101-102-103. ELEMENTARY GERMAN 4 hours
The aim is to develop the ability to understand, speak, read, and write German. Stress on functional, rather than formal grammar. Special emphasis on early and fluent speaking. Elementary reading based on German life, customs, and manners. Three class hours and two periods of scheduled laboratory practice a week.
201-202-203. Intermediate German 4 hours
A systematic review of the fundamentals of grammar, pronunciation, vocabulary and idioms. Abundant conversational practice and composition based on short stories, plays, poetry, and easy scientific material. Occasional lectures on German life, history, civilization, art, music, etc. illustrated with slides, film strips and motion pictures with German sound tracks. Three class periods and two hours of scheduled laboratory practice a week.
Prerequisite: German 101-103.

221-222-223. Scientific German 3 hours
The objective is to enable the student to use German in professional or graduate work. The technique of reading advanced German and its application; practice in intensive and extensive reading of scientific material. Emphasis on special needs and interests of each individual student according to his field of study. German technical magazines and books are used.
Prerequisite: German 101-103.

301-302-303. German Conversation and Composition 4 hours
Based on a wide range of topics dealing with Germany. The aim is to develop both a useful command of the German language and an appreciation of German civilization. Recorded conversational dialogues on a variety of topics useful to the student or traveler in Germany, Austria, and Switzerland, films and slides, and current German periodicals are used. Three class periods and two hours of scheduled laboratory practice a week.
Prerequisite: German 101-103, 201-203.

311-312-313. Lessing, Goethe, Schiller 3 hours
Although the course emphasizes literary appreciation rather than practice in the language, considerable opportunity is offered in the discussions for such practice.
Prerequisite: German 201-203, 301-303.

321-322-323. Modern German Literature Since 1890 3 hours
Reading and discussion of plays, fiction and poetry of such authors as Hauptmann, Schnitzler, Kaiser, Thomas Mann, Werfel, Hesse, Dehmel, Rilke, George, etc.
Prerequisite: German 201-203, 301-303.

331-332-333. Survey of German Literature 3 hours
Basic monuments of German literature from the earliest times to
the present. Lectures, class discussions, reading of representative masterpieces, reports.

Prerequisite: German 201-203, 301-303.

341-342-343. History of German Civilization 3 hours
A survey of the main contributions to Western civilization as represented by characteristic periods and movements. The English lectures, illustrated by slides, film strips, motion pictures, music recordings, etc. though diverse in nature, have sufficient unity to constitute a connected picture of German civilization in many of its aspects, and display a correlation between German history, philosophy, literature, music, art, science, etc.

Conducted in English. Open to all students, except freshmen.

351-352. The German Drama in Translation 3 hours
The development of German drama since 1750.

Conducted in English. Reading and discussion in English. Open to all students, except freshmen.

361-362-363. Non-Dramatic German Literature in Translation 3 hours
The epic, the lyric, and the novel.

Conducted in English. Reading and discussion in English. Open to all students, except freshmen.

401-402-403. Deutsche Kulturgeschichte 3 hours
The course, given entirely in German, is similar in content of German 341-343 (History of German Civilization), and is required of all German majors.

Prerequisite: German 201-203, 301-303, 331-333.

440. German Seminar 3 hours
For seniors majoring in German. May be repeated up to 6 hours.

SPANISH

101-102-103. Elementary Spanish 4 hours
The aim is to develop the ability to understand, speak, read, and write Spanish. Stress on functional, rather than formal grammar. Special emphasis on early and fluent speaking. Elementary reading based on Spanish life, customs and manners, using materials dealing with Spain, Mexico and South America. Three class periods and two scheduled laboratory practices.
201-202-203. Intermediate Spanish  
4 hours
A systematic review of the fundamentals of grammar and pronunciation. Abundant conversational practice and composition based on short stories, plays and poetry. Occasional lectures in Spanish on Spanish life, history, architecture, art and civilization. Regular use made of film strips, slides and motion pictures with Spanish sound tracks. Three class periods and two scheduled laboratory practices.
Prerequisite: Spanish 101-103, or two years of high school instruction in Spanish.

301-302-303. Spanish Conversation and Composition  
4 hours
Based on a wide range of topics dealing with Spain and the Spanish-speaking world. The aim is to develop both a useful command of the language and an appreciation of Spanish civilization. Recorded conversational dialogues on a variety of topics useful to the student or traveler in Spain, Mexico and Latin America, films, slides, and current periodicals are used and discussed. A study of commercial Spanish, and practice in correspondence, especially useful to students in the Department of Economics and Business Administration. Three class periods and two hours of scheduled laboratory practice.
Prerequisite: Spanish 201-203.

311-312-313. Survey of Spanish Literature  
3 hours
A study of the background, main trends and chief authors in the literature of Spain from the beginnings to the present, with special emphasis on the Golden Age. Discussions, readings and reports.
Prerequisite: Spanish 201-203.

321-322-323. Spanish American Literature  
3 hours
Main currents of Spanish-American literature with relation to their European background.
Prerequisite: Spanish 201-203.

331-332-333. Theatre of the Golden Age in Spain  
3 hours
A study of the origin, and development of the Spanish comedia. Representative works will be studied with special emphasis on individual characteristics. Lectures, readings and reports.
Prerequisite: Spanish 201-203, 311-313.

341-342-343. Hispanic Civilization  
3 hours
An integrated picture of the political, economic, social, geographical, and cultural forces which have shaped Spain and Latin America.
Conducted in English. Open to all students, except freshmen. Class work and reading in English.
351-352-353. THE SPANISH DRAMA 3 hours
A summary course for juniors and seniors unacquainted with Spanish.
Conducted in English. Class work and reading in English.

361-362-363. THE SPANISH NOVEL 3 hours
A summary course for juniors and seniors who do not read Spanish.
Conducted in English. Class work and reading in English.

440. SPANISH SEMINAR 3 hours
For seniors majoring in Spanish. May be repeated up to 6 hours.

ITALIAN

101-102-103. ELEMENTARY ITALIAN 4 hours
The aim is to develop the ability to understand, speak, read, and write Italian. Stress on functional, rather than formal grammar. Special emphasis on ear-training, diction, and oral practice. Elementary reading based on Italian life and music. Designed for voice-students. Three class hours and two periods of scheduled laboratory practice a week.

201-202-203. INTERMEDIATE ITALIAN 4 hours
A systematic review of the fundamentals of pronunciation, grammar, vocabulary and idioms. Intensive and extensive reading. Designed to prepare the student for more advanced study and spoken and literary Italian. Three class periods and two hours of scheduled laboratory practice a week.
Prerequisite: Italian 101-103.

RUSSIAN

101-102-103. ELEMENTARY RUSSIAN 4 hours
Ear training leading to instantaneous aural comprehension. Oral structural drill in basic grammatical patterns. Elementary reading based on Russian life, customs and manners. Simple conversation based on practical, every-day situations. Three class periods and two hours of scheduled laboratory practice a week.

201-202-203. INTERMEDIATE RUSSIAN 4 hours
Oral grammatical review, and conversational practice. Advanced reading (short stories, plays, Russian history and easy science material). Occasional lectures on Russian life, history, art and civiliza-
tion. Regular use made of film strips, slides and motion pictures. *Three class periods and two hours of scheduled laboratory practice a week. Prerequisite: Russian 101-103.*

221-222-223. **Scientific Russian** 3 hours

The objective is to enable the student to use Russian in professional or graduate work. The technique of reading advanced Russian and its application; practice in intensive and extensive reading of scientific material. Emphasis on special needs and interests of each individual student according to his field of study. Russian technical periodicals and books are used.

*Prerequisite: Russian 101-103.*

440. **Problems in Russian** 3 hours

Research or special projects for seniors prepared to do special work in Russian.

**CLASSICAL GREEK**

101-102-103. **First Year Greek** 3 hours

The aim of this course is to develop the ability to read, understand, and translate classical Greek through an adequate grasp of the structure of this highly inflected language. Selected readings from Greek prose writers.

201-202-203. **Second Year Greek** 3 hours

The objective is to develop the student's skill in interpreting Greek prose and poetry from the classical period. Further elaboration of points of grammar and syntax arising from the reading material. Occasional lectures on Greek civilization illustrated with slides.

**LATIN**

101-102-103. **Elementary Latin** 3 hours

The course is designed for those students who have not had Latin in high school. Given upon sufficient demand.

201-202-203. **Intermediate Latin** 3 hours

Reading from various Latin writers. Given upon sufficient demand. *Prerequisite: Latin 101-103, or two units of high school Latin.*
History and Political Science

Professor Hilliard (Chairman), Professor Binkley, Professor Darlington, Professor Milnar, Associate Professor Gray, Assistant Professor Sobers

The History Courses stress the evolution of human institutions with a view to developing an understanding of our present civilization. Students majoring in History must take courses in both American and European History and electives in the allied social sciences, particularly Political Science, Sociology, Psychology and Economics. It is the policy of the Department to recommend no graduate for the teaching of History who has not taken nine hours in American Government in addition to the hours of his History major.

HISTORY

The most appropriate sequence of courses for a field of concentration in History would be History of Western Civilization 111, 112, 113; History of the United States 211, 212, 213; History of England 321, 322, 323; Recent American History 361, 362; or Constitutional History of the United States 331, 332; and Recent European History 371, 372, 373. In addition to the forty-five hours required for the field of concentration in History the student must complete nine hours in American Government.

111. History of Western Civilization to 1517 3 hours
112. History of Western Civilization: 1517 to 1815 3 hours
113. History of Western Civilization: 1815 to the Present Time 3 hours

An introductory survey of European history. The Mediaeval background, the Renaissance, the rise of international rivalry, the World Wars and their aftermath. Open to Freshmen.

211. History of the United States to 1850 3 hours
212. History of the United States: 1850 to 1900 3 hours
213. History of the United States: 1900 to the Present 3 hours

A study of the political, social and economic development of the United States from the colonial period to the present time.

303. History of Ohio 3 hours

The political and cultural evolution of the state from prehistoric times to the present.

Prerequisite: History 211, 212, 213, or consent of the Instructor.
321. English History to 1603 3 hours

322. English History: 1603-1815 3 hours

323. English History: 1815 to the Present Time 3 hours

A general introductory study of the English people in their political, social and institutional development, followed by a survey of the growth of the British Empire and evolution of the British Commonwealth of Nations.

324. Renaissance 3 hours

The political evolution of the Italian communes into city republics, with emphasis on Florence, Milan, Genoa and Rome; early capitalism and industrial and commercial movements; an analysis of the culture, art, science, and literature of the period and their influence upon the Church, the Papacy, and modern modes of thought and behavior.

325. Reformation 3 hours

The Church and European society in the later Middle Ages; culture and thought in the age of the Reformation; the rise of the European state system; Luther and the beginning of the Reformation; Zwingli and Switzerland; Calvin; the expansion of Protestantism in Europe; the Counter Reformation; and the relation of the Reformation to medieval and modern civilization.

327. Revolutionary Era 3 hours

A study of the period of the French Revolution and Napoleon, with emphasis on the philosophical background and ideological developments of the period, together with their effect on later history.

331-332. Constitutional History of the United States 6 hours

A survey of the constitutional development of the United States from the colonial period to the present time.

Prerequisite: Political Science 201, 202, 203, and History 211, 212, 213.

341-342. American Foreign Relations 6 hours

The inception, development and present interpretation of the outstanding foreign policies of the United States; the emergence of the United States as a world power; the trend from isolationism.

Prerequisite: History 211, 212, 213.

343. Modern History of the Far East 3 hours

A study of China and Japan since 1840 with attention given to other neighboring nations as they affect the overall political and cultural development of the Far East.

Prerequisite: History 111, 112, 113.
344. HISTORY OF THE MODERN MIDDLE EAST 3 hours
A study of the social, political, and economic evolution of Turkey, Iran, and the Arab World from 1800 to the present.

351-352. ANCIENT HISTORY 6 hours
The development of civilization from pre-history to the fall of Rome. Emphasis is placed upon the early pre-Greek Oriental civilization and the cultural and political contributions of the period.

353-354. LATIN AMERICA 6 hours
The conditions in Spain and Portugal leading to Latin American colonization, and the growth of the cultural and political institutions of Latin America. The struggle for independence, and the rise of the modern Latin American Republics.

361-362. RECENT AMERICAN HISTORY 6 hours
An investigation and intensive study of some of the major movements of United States history since 1900.
Prerequisite: History 211, 212, 213.

371-372-373. RECENT EUROPEAN HISTORY 9 hours
Europe and its relations with the rest of the world since 1914: imperialism; the alliance system; World War I; the war debt and reparations problems; the rise of the Soviet Union and the fascist powers; the great depression; relations with the Middle-East and the Far-East; World War II; the Cold War.
Prerequisite: 111, 112, 113.

381. THE WESTWARD MOVEMENT IN THE UNITED STATES 3 hours
Territorial expansion from colonial times to the present. Emphasis is placed on Indian relations, land policies, transportation and trade.

382. THE WESTWARD MOVEMENT IN THE UNITED STATES 3 hours
A continuation of the first course; the advance of the frontier. The development of sectionalism; the influence of the West on American ideals and institutions. Emphasis is placed on the Trans-Mississippi West.
Prerequisite: 211, 212, 213 or consent of the instructor.

411, 412, 413. RUSSIAN HISTORY 9 hours
A study of the development of Russia from the time of Peter the Great to the present. The courses place emphasis upon the economic and social development, political and religious traditions, the nationalist, liberal, socialist and revolutionary developments, the post-war developments of the U.S.S.R., and the role of Russia in European affairs.
440. History Problems 3 hours
Individual investigation on a specific problem. Open to qualified Seniors majoring in History.

POLITICAL SCIENCE

The courses in Political Science are designed to prepare the student for the intelligent performance of the functions of citizenship, for entrance into public service, for the study of Law, and for graduate study in this field. Those majoring in Political Science are advised also to pursue courses in Sociology, Psychology, History and Economics.

201-202-203. American Government 9 hours
A study of the origin, development, structure, and functions of national, state and local governments in the United States. Sophomore course.

312. Municipal Government 3 hours
A study of the principal problems of municipal government in the United States.
Prerequisite: Political Science 201, 202, 203.

331-332. Comparative Government 6 hours
A study of the governments of England, France, Germany, and Russia.
Prerequisite: Political Science 201, 202, 203, or consent of the Instructor.

341. American Political Parties 3 hours
A brief survey of the development of political parties in the United States followed by an investigation of the psychological, sociological, and practical aspects of the phenomena of political parties.
Prerequisite: Nine hours of Political Science or the consent of the Instructor.

353. American Political Theories 3 hours
The development of American political theories from the colonial period to the present with a view to providing a basis for rational approach to the solution of our present political problems.
Prerequisite: Nine hours of Political Science or the consent of the Instructor.
363. Public Administration 3 hours
A study of the problems and fundamental principles of administration in modern governments, national, state and local.
Prerequisite: Political Science 201, 202, and 203 or the consent of the Instructor.

371-372. International Relations 6 hours
A study of the forces which determine the foreign policies of the major world powers. An introduction to diplomatic procedures; the sources of power; the organization and functions of the United Nations.

373. Contemporary International Problems 3 hours
An analysis of contemporary problems with a view to methods of pacific settlement. The Department of State problem method is used.

383. European Political Theories 3 hours
A survey of the development of political philosophy from the period of Ancient Greece to modern times.
Prerequisite: Political Science 201, 202, 203, or the consent of the Instructor.

391. Social Forces in American Government 3 hours
An investigation of the part played by interest and pressure groups and ideologies in the determination and execution of public policies.

421. Government of the Soviet Union 3 hours
Demographic, historical and ideological basis of Soviet rule. The social and governmental structure. Nationalism and federalism. The Party. Trade unions and cooperatives. The Church, army, courts, prosecutors, and organs of police. Dynamics of power in the U.S.S.R.

422. Foreign Policy of the Soviet Union 3 hours
The constant factors in Russian foreign policy. Policy of the early years as affected by Marxian ideology, internal conditions and foreign interference. Period of truce and limited cooperation with Western Powers. Second World War and aftermath.

423. Soviet Social and Economic Institutions 3 hours
A comparative study of the Soviet economic structure and legislation; general principles of private law, including family law; industrial and trade relations; labor law; and collective farms.

450. Political Science Problems 3 hours
Individual investigation in the field of political science. Open to qualified seniors majoring in this department.
Industrial Arts

Assistant Professor Kain (Chairman), Mr. Bowling

The courses constituting the Industrial Arts curriculum are organized (1) to provide a diversified program for students who desire to teach industrial and technical subjects in the public schools and who may later wish to continue their specialization through advanced study in graduate school; (2) to offer technical information and practical laboratory experiences to persons interested in preparing for supervisory positions and industrial vocations; (3) to give engineering students an understanding of typical industrial processes and their application; and (4) to assist in the preparation of teachers in elementary and secondary education by providing functional activities in craftwork through the utilization of simple tools and inexpensive materials.

Students concentrating in Industrial Arts are required to complete a minimum of 68 quarter hours of courses in the areas of drawing, woodworking, metalworking, graphic arts and printing, electricity-electronics, ceramics, and automotives. Four years of study in these areas and in the areas of general and professional education qualify the student for the Professional Special Certificate required for teacher certification.

Prospective teachers who do not wish to specialize in Industrial Arts as a major teaching field but desire to obtain experience sufficient to teach courses on a minor basis are required to complete a minimum of 40 quarter hours in the previously mentioned areas. Fulfillment of these requirements and the requirements in the field of concentration leads to qualification for the Provisional Teaching Certificate.

101-102-103 Industrial Arts 9 hours

These three courses constitute one year of Industrial Arts, presenting a basic coverage of the philosophical origins and contemporary practices. The functions of Industrial Arts and insights into the profession are exemplified through public school visitations and visiting speakers. The fundamental procedures, operations, and the special equipment for each of the several areas of Industrial Arts are briefly explored through laboratory activities.

111. Drawing I 3 hours

Use of instruments, applied geometry, lettering, orthographic pro-
jection, and pictorial drawing. This course is offered in the College of Engineering.

112. Drawing II 3 hours
Continuation of 111 Drawing. Developments, intersection, and working drawings. Projects in the main fields of engineering are used. This course is offered in the College of Engineering.
Prerequisite: 111 Drawing.

113. Drawing 4 hours
General drawing for students majoring in either industrial arts or elementary and secondary education. The course includes instrument drawing and sketching in the areas of woodworking, machinery, aeronautics, architecture, advertising, statistics, and cartography; emphasizing orthographic, isometric, perspective, parallel and radial developments, and other types of projections. The course also provides experiences in photocopy work and blueprinting.

200. Wood Turning 2 hours
This is the beginning course in woodworking with emphasis placed upon lathe operation and maintenance and the methods of shaping articles through positioning and use of various turning tools. Included also are sanding, finishing, and polishing procedures. This course may be arranged by permission any quarter.

201. Woodwork I 3 hours
Being a basic course in wood fabrication, the instructional units emphasize the principles of planning, layout, and the elements of design as applied to less complicated projects. The use and care of woodworking hand tools, the characteristics and utilization of furniture woods, and the making of joints and their application to hand constructed projects constitute the laboratory activities.
Prerequisite: 111 Drawing, 101, 102, 103 Industrial Arts.

202. Woodwork II 3 hours
A continuation of Woodwork I but stressing the operation and use of power machinery in pattern, cabinet, and furniture fabrication, including surface decoration and finishing procedures.
Prerequisite: 201 Woodwork.

203. Woodwork III 3 hours
Particular emphasis is placed upon advanced furniture construction procedures, featuring carving, turning, banding, inlaying, fluting, and other types of ornamental surface decoration.
Prerequisite: 202 Woodwork.
210. Handcrafts for Teachers 

The primary purpose of this course is to introduce prospective teachers, both elementary and secondary, to the basic hand tools and their proper manipulation in simple constructional activities. Exemplary projects are chosen to meet typical units of study, their construction utilizing available and inexpensive materials.

212. Finishing Methods and Materials 

A study of finishing materials, their composition, qualities, and characteristics; protective agents and preservatives. Mixing and matching colors. Interior floor and wall treatment and finishes. Experience in the application of various finishes to wood and metal.

221, 222, 223. Ceramics 

Introduction to pottery making. Experiences in forming, glazing and firing. Hand building and use of the potter's wheel. Introduction to the art phases of the ceramic field with emphasis on the decorative processes. Mold making and casting of ceramic ware. Copper enameling.

300. Woodwork IV 

An advanced course in cabinet making with major consideration given to design, style, and finishes. Power machinery, jigs, fixtures, and electric hand machines are employed in rendering decorative effects and in fabrication. Arranged by permission of the department chairman.

Prerequisite: 203 Woodwork.

301. Metalwork I 

Fundamentals of general metalwork. The course provides practice in layout and pattern drafting, bending, forming, seaming, soldering, resistance and oxyacetylene welding and machining. Minor problems in wrought iron work. Construction of fixtures, tools, ornaments, and furniture.

302. Metalwork II 

Machine shop practice and metalwork technology. Precision measuring and layout in metalwork. The study and operation of the engine lathe, shaper, milling machine, grinder, and power hack-saw. Machining of bar stock and castings.

Prerequisite: 301.

311. Industrial Materials and Processes 

The aim of this course is to present a study of industrial materials, their origins, sources, characteristics, uses, and the manufacturing
processes involved in industrial production. Classroom discussions, technical motion pictures, and field trips to refineries, mines, quarries, mills, kilns, foundries, machine shops, and other manufacturing firms assist the student in gaining an understanding of the processing and utilization of many kinds of materials.

320. ARTS AND CRAFTS  3 hours
Laboratory experiences in working with a large selection of craft materials: copper, brass, aluminum, wood, plastics, leather, gemstones, textiles, reed, and others. The essentials of design and ornamentation are considered as they are applicable to the material. Primary emphasis is given to handcraft techniques and the tools and procedures involved.

321-322. LAPIDARY AND JEWELRY  6 hours
Introduction to the fundamentals of the art of lapidary; knowledge of jewelry materials and design. Experiences in working with natural and synthetic stones including the sawing, shaping, polishing, and mounting of jewelry stones.

323. INDUSTRIAL ARTS ORGANIZATION AND METHODS  5 hours
A professional course in the methods of teaching Industrial Arts, featuring the determination of objectives, preparing lesson plans, organizing courses, laboratory procedures, instructional materials, and administrative practices. Visitations are made to representative high school laboratories. Open only to students having 30 hours or more of Industrial Arts courses.

331. GRAPHIC ARTS  3 hours
An introductory course in the manipulative processes of duplicating written communications. Practical experiences in process printing, mimeographing, spirit duplicating, photographics, blueprinting, block printing, etching, and letterpress printing.

332. PRINTING  3 hours
An historical study of printing with typical exercises in composition, typography, imposition, principles of display, platen press and cylinder press operation.
Prerequisite: 331 Graphic Arts or permission of the department chairman.

343. LABORATORY PLANNING AND EQUIPMENT  2 hours
The architectural features, selection, arrangement, and mainte-
nance of equipment of the modern Industrial Arts laboratory. The drawing of floor plans.

*Prerequisite: Same as and to accompany 323 Industrial Arts Organization and Methods.*

**353. Patternmaking and Foundry** 3 hours


**361, 362, 363. Advanced Ceramics** 9 hours

Emphasis on the art and decorative phases of Ceramics.

*Prerequisites: Industrial Arts 221, 222, 223.*

**400. Woodturning II** 3 hours

Continuation of Woodturning 200 on an advanced level. Arranged by permission any quarter.

**403. Metalwork III** 3–5 hours


**411. Fundamentals of Electricity** 3 hours

A study of the principles of electricity: magnetism, current, Ohm’s Law, circuitry, heating effects, and power. Practical calculations and the application of principles to laboratory experiments and to the construction of a variety of electrical devices.

**412. Functional Electronics** 3 hours

An introduction to the field of electronics. Study and experimentation with vacuum tubes, rectifiers, power supplies, amplifiers, oscillators, transmitters, and receivers. Basic lessons in International Morse Code and amateur radio operating techniques and procedures.

*Prerequisite: 411 Fundamentals of Electricity or the equivalent.*

**413. Automotives** 3 hours

The course is designed to provide an understanding of the construction and operating principles of the modern motor vehicle. The laboratory activities provide experiences in the present-day methods of maintaining and repairing automobiles as determined through scientific methods of diagnosing troubles.

*Prerequisites: Metals 302 or the permission of the instructor.*
420. Photography 3 hours
A course designed to present proper picture taking techniques through the study of photographic composition, camera types and accessories, photographic optics, and laboratory methods and materials. Dark room practices in developing and printing negatives are featured in this course.

421, 422. Advanced Arts and Crafts 3 hours each
Continuation of Arts and Crafts 320 on an advanced level.

440. Special Problems in Industrial Arts 1–3 hours
Industrial Arts students of Junior or Senior standing are given special professional assignments dealing with problems not fully explored in the methods courses. Problems in course organization, curriculum content, laboratory equipment maintenance and repair, investigation of research materials, and planned observations are featured on an individual basis.

Time for the course is arranged by permission of the department chairman any quarter.

480. Student Teaching in Industrial Arts Education 6 hours
See Education 480.

Mathematics

Professor Miser (Chairman), Associate Professor Opatowski,
Assistant Professor Bennett, Assistant Professor Kavassay,
Mrs. Roider, Mr. Lhamon, and Mr. Sarkis

The Department offers courses designed primarily as part of a liberal education and as requirements for students in mathematics, science, engineering, education, and pharmacy. In all courses the theory developed is followed by applications to exercises and practical problems.

Students concentrating in mathematics should follow a sequence of courses through Mathematics 222, Calculus III. Beyond this course, a student majoring in mathematics will need twenty or more hours. A reading knowledge of German or French is strongly recommended.

The requirement that all freshman students in liberal arts shall take Mathematics 111-112-113 will begin in September 1960 unless they elect to take Mathematics 121 and 122, or Mathematics 131 and 132, or Mathematics 181 and 182.

The several courses for freshmen are based on the entrance units which are indicated as prerequisite for each course. The following
table and the prerequisites listed with each course should be observed in registering for a course:

<table>
<thead>
<tr>
<th>Freshman Courses</th>
<th>Required of students in</th>
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<tbody>
<tr>
<td>Math 111-112-113</td>
<td>Liberal Arts, Pre-pharmacy</td>
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<tr>
<td>Math 111-112</td>
<td>4 yr. Elementary Education</td>
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<tr>
<td>Math 111</td>
<td>Elementary Cadet Education</td>
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<tr>
<td>Math 121, 122, 132</td>
<td>Science, Mathematics</td>
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<tr>
<td>Math 131, 132, 133</td>
<td>Engineering, Science, Mathematics</td>
</tr>
<tr>
<td>Math 181, 182</td>
<td>Business Administration</td>
</tr>
</tbody>
</table>

100. Preparation for College Mathematics  No Credit, 3 hours
Review of arithmetic; transition to algebra; factoring, fractions, linear and quadratic equations; exponents and radicals.

111-112-113. Fundamental Mathematics  9 hours
A one year terminal course. Logic in mathematics and science, the number concept and number systems, arithmetic, the logic of algebra, exponents and logarithms, definitions and use of trigonometric functions, introduction to analytic geometry, various geometries, some classical problems.
Prerequisite: One year of Algebra.

121. College Algebra  5 hours
Factoring, fractions; equations in one, two and three unknowns; exponents, radicals; quadratic equations. From here the algebra content is the same as in Math 131.
Prerequisite: 1½ units algebra, 1 unit plane geometry.

122. Trigonometry  5 hours
The fundamental principles of the subject are developed and applied to trigonometric reductions and to the solutions of triangles. Numerous exercises in geometry, physics, and mechanics are studied.
Prerequisite: Mathematics 121 or equivalent.

131. College Algebra and Trigonometry  5 hours
Simultaneous quadratics, inequalities, binomial theorem, progressions, complex numbers, theory of equations, and determinants; the trigonometry deals with the formulas for the sum and difference of two angles, for the half angle; sine law, cosine law, law of tangents; solutions by logarithms of general triangles; trigonometric equations, inverse functions.
Prerequisite: 2 units algebra, 1 unit plane geometry, ½ unit trigonometry; and/or successful completion of Engineering 100.
132. Analytic Geometry 5 hours
Straight lines; conics; translation and rotation of axes; higher plane curves; parametric equations; polar coordinates; oblique coordinates; space curves and surfaces; planes; quadrics; spherical coordinates.
Prerequisite: Mathematics 131 or Mathematics 121 and 122.

133. Calculus I 5 hours
Through exponential and logarithmic functions; some integration; applications to geometry and physics.
Prerequisite: Mathematics 132.

181. Mathematics of Finance I 5 hours
Selected portions of arithmetic, elementary algebra, and college algebra, including logarithms and binomial theorem.
Prerequisite: 1 unit algebra.

182. Mathematics of Finance II 3 hours
This course acquaints the student with the mathematical tools of business. It treats simple and compound interest; discounts; installment buying; depreciation; price of bonds; amortization; sinking funds and types of annuities. Required of Business Administration and Secretarial students.
Prerequisite: Mathematics 181 or equivalent.

221. Calculus II 5 hours
Mean value theorems; indeterminate forms; formulas of integration; areas, volumes; applications; centroids.
Prerequisite: Mathematics 133.

222. Calculus III 5 hours
Moments of inertia; fluid pressure work; series, power series; approximate integration; partial differentiation; double, triple integrals; hyperbolic functions; applications.
Prerequisite: Mathematics 221.

223. Differential Equations and Vector Analysis 5 hours
Equations of first order and degree; trajectories; homogeneous and extended linear equations with constant coefficients; operational methods; applications. Vector algebra; application to mechanics; differential operator del; divergence, curl; integration; work, potential.
Prerequisite: Mathematics 222.
College of Liberal Arts

283. ELEMENTARY STATISTICS  3 hours
This course deals with the concepts and practices commonly used in statistical problems of business, economics and education.
Prerequisite: Mathematics 121 or 181 or equivalent.

300. ANALYTIC GEOMETRY OF SPACE  4 hours
This offering is planned to give the student a good working knowledge of coordinate geometry in three dimensional space. Equations of the first and second degree of two and three unknowns are stressed.
Prerequisite: Mathematics 133.

302. COLLEGE GEOMETRY  4 hours
This Course is designed to meet the needs of those who expect to teach Mathematics in the public schools. General methods leading to the solution and construction of geometric problems are studied.
Prerequisite: Mathematics 133.

320. THEORY OF EQUATIONS  4 hours
Roots of polynomials; equations of higher degree; methods of solution; Sturm's theorem; symmetric functions of roots; resultants, discriminants; introduction to matrices; geometric constructions.
Prerequisite: Mathematics 133.

322. ADVANCED CALCULUS  3 hours
Mean value theorems; series; partial differentiation, geometric interpretation; line integrals; gamma functions; introduction to La Place transforms; theory of complex variables; conformal transformations.
Prerequisite: Mathematics 222.

324. ADVANCED CALCULUS  3 hours
Continuation of Mathematics 322.

330. BASIC STATISTICAL CONTROL  3 hours
An advanced course in statistics, presenting fundamental statistical aspects such as variability multiple correlation and measures of functions of distribution; control charts; tests for significance; fundamentals of the theory of probability and sampling.
Prerequisite: Mathematics 222, 283.

401. HISTORY OF MATHEMATICS  3 hours
A study of the development of mathematics with emphasis on number systems as well as basic topics in mathematics. Planned also to give prospective teachers of mathematics a survey of the historical development of the subject.
Prerequisite: Mathematics 133.
410. **Introduction to Modern Algebra** 3 hours
Integers, rational, real and complex numbers, elementary group theory, rings, fields, determinants and matrices.
*Prerequisite:* Mathematics 133.

**Music**

**Professor Roider (Chairman), Associate Professor Matthews, Assistant Professor Hill, Mr. Grigsby**

Instruction is provided for those who desire to become teachers and supervisors of Music, and an opportunity is afforded to those who wish to devote themselves to the literature of music, and those who desire a background in choosing music as a profession. Because training in music should be based upon a broad and thorough general education, the curricula have been so constructed as to secure a symmetrical balance between musical and academic subjects.

**Bachelor of Arts with Major in Music**

A field of concentration of forty-five (45) hours of Music is required for the degree of Bachelor of Arts. The field of concentration consists of the following courses:

The Structure of Music, The History of Music, Applied Music and Ensemble participation. The Structure of Music should constitute about eighteen hours in this field of concentration.

The courses are not inflexible and may be changed to meet the requirements of the individual by consulting the Dean and the Head of the Department.

**Public School Music**

This curriculum is approved by the State Department of Education for the training of teachers and supervisors of Public School Music. The degree of Bachelor of Science in Education is granted to students completing the Public School Music curriculum, and such persons are granted the state four-year Provisional Certificate.

**Applied Music**

20a. **Voice** 1–2 hours *per quarter*

The courses in voice aim to establish correct physical and mental poise, the principles of breathing and breath control, proper diction.
and articulation using the best of various methods from the old Italian classic of the bel canto period to the modern scientific theories. Repertoire, interpretation, and presentation are stressed, and opportunities are afforded each student to present vocal works before an audience through recital and student assembly. Students are encouraged to study songs in the modern languages, Italian, French, and German.

20b. Piano 1–2 hours per quarter

The special needs of each individual student guide the approach to instruction in piano playing. Technical studies and selections are carefully chosen to develop the student’s ability to recreate the desire of the composer. As music is a means of intellectual culture and artistic enjoyment, the works of the masters are stressed through all grades. Recitals and public appearances give the student an opportunity to gain poise and develop self-assurance.

20c. Organ 1–2 hours per quarter

No student will be accepted unless he has reached a grade in piano playing sufficient to warrant organ instruction. The course of study provides for thorough training in preparation for church and concert work including the best organ literature and the principles of modulation, accompaniment, and improvisation.

20d. Strings 1–2 hours per quarter

20e. Woodwinds

20f. Brasses

20g. Percussion

After a thorough preparation in the fundamentals, instruction includes not only the systematic development of adequate technical facility but also definite emphasis on such phases as intonation, tone production, and style, all necessary to artistic performance and interpretation. The course of study is flexible and depends upon the individual needs and qualifications of the student.

35. Chorus-Choir 1 hour per quarter up to 6 hours

Students of any College of Ohio Northern University interested in singing in the Chorus-Choir have the opportunity to try out for this organization. Music of all types, accompanied and a cappella, is used throughout the year. Sacred and secular music for concerts at the University and outside the community are a part of the program.

40. Band 1 hour per quarter up to 6 hours

All University students who play band instruments are given the op-
portunity to play in the University Band. A wide variety of material is used throughout the year. The Band appears in concert as well as at many school and community functions. Band members may participate in woodwind and brass ensembles.

45. **Orchestra**
   
   1 hour per quarter up to 6 hours
   
   All university students who play orchestral instruments are given the opportunity to participate in the Lima Symphony Orchestra. Enrollment is subject to audition.

50. **Vocal Ensemble**
   
   1 hour per quarter up to 6 hours
   
   Enrollment by permission of instructor.

55. **Instrumental Ensemble**
   
   1 hour per quarter up to 6 hours
   
   Enrollment by permission of instructor.

**MUSIC FEES**

All students who register for private instruction in voice, piano, organ or other instrument are required to pay the following fees:

- One lesson each week (30 min.) $25.00 1 credit hour
- Two lessons each week $45.00 2 credit hours

**COURSES IN MUSIC**

101-102-103. **The Structure of Music**

9 hours

Including the singing, reading, and writing of scales, intervals, triads and simple part-writing from melodies and figured bases. As the course progresses, seventh chords, modulation and the non-harmonic tones are added. Original work includes the hymn tune and simple two and three part song-forms.

111. **Music for the Elementary Classroom Teacher** (Primary)

2 hours

Summer and Evening Division Course

Music activities, music materials, and literature, unit planning and teaching methods and skills for the elementary classroom teacher—grades 1-3 including kindergarten. This includes the use of the auto-harp, melody bells, rhythm instruments, records, and creativity.

112. **Music for the Elementary Classroom Teacher** (Intermediate)

2 hours

Summer and Evening Division Course

Music activities, music materials, and literature, unit planning and teaching methods and skills for the elementary classroom teacher—
grades 1-3 including kindergarten. This includes the use of the auto-
harp, melody instruments, records, and creativity.

113. ADVANCED MUSIC METHODS FOR THE CLASSROOM TEACHER 2 hours

Summer and Evening Division Course 3 hours

Concentration on further development of the elementary music program.

200. THE STUDY OF MUSIC 3 hours

A survey type course stressing listening experience rather than the
technicalities of musical development in history. Each quarter covers
material inclusive of the seventeenth century, eighteenth and early
nineteenth centuries, and from the Romantic period to the present
time. Each quarter includes rudiments in musical analysis and score
reading. The aim of the Course is to equip the student with the
tools necessary to a more full and intelligent enjoyment of good mu-
sical literature. Meets the Liberal Arts music requirement.

211-212-213. THE STRUCTURE OF MUSIC 9 hours

Altered chords, non-harmonic tones, chromatics, and advanced mod-
ulation are added to the previous year of the Structure of Music.
Analytical technique of music compositions and the study of Musical
Form from the motive and song-form to the sonata and contrapuntal
forms.

Prerequisite: The Structure of Music 103.

301-302-303. CONDUCTING 6 hours

Courses in principles of conducting concluding with conducting
choral, band and orchestra scores.

311. PRIMARY MUSIC METHODS (Music Teachers) 3 hours

The study of music techniques, teaching procedures, and the use of
materials in the primary grades. This course is designed for music
teachers and supervisors.

312. INTERMEDIATE MUSIC METHODS (Music Teachers) 3 hours

The study of music techniques, teaching procedures, and the use of
materials and instruments in the intermediate grades. This course is
designed for music teachers and supervisors.

313. JUNIOR AND SENIOR HIGH SCHOOL METHODS (Music Teachers) 3 hours

The study of music techniques, teaching procedures and the use
of materials and instruments in the junior and senior high school. This
includes the study of band, orchestra, and chorus organization and management, high school repertoire, competition—festival and public performance participation.

320. Class Voice 2–6 hours

330. Functional Piano 1 hour

Group instruction designed to prepare the music specialist and general student in the piano literature appropriate to the primary and secondary school situations. Improvisation, the extemporaneous harmonization of melodies and experience in vocal and instrumental accompaniment are included in the course of study.

340. Music in Worship 3 hours

A consideration of the form and symbols of the service of worship. A course designed to aid the Pre-Theological student to an understanding of the traditional and modern trends in all forms of worship with special emphasis on the ties between music, other arts, and the litany of a service.

350. Technics and Materials for Church Choirs 3 hours

A study of methods and materials for church choirs. The study of practical problems of mounting a church service, chanting, procession, etc., with consideration of anthem selection and performance, with observation of choirs.

Prerequisite: At least 30 quarter hours of music courses.

351-352-353. History of Music 9 hours

These courses deal with the origin and development of music, studied from an appreciative basis.

420. Instrumentation and Orchestration 1–3 hours

Designed to give the public school music instructor in the instrumental field of music a thorough knowledge of the instruments of the orchestra and band, and the arrangements of music for complete school orchestras and bands.

430. Counterpoint and Choral Arranging 1–3 hours

Courses designed to give the public school music instructor in the vocal field of music the technique of contrapuntal writing, and the arranging of music for the school choir, glee clubs, and vocal organizations.

440. Special Problems 1–3 hours

Open only to seniors who are majors in music.
441. Teaching of Brass and Percussion Instruments 2 hours
442. Teaching of Woodwind Instruments 2 hours
443. Teaching of Stringed Instruments 2 hours
Courses designed to give the prospective teacher a general knowledge of the playing technique of the instruments in the band and orchestra.
480. Supervised Teaching in Elementary, Junior, and Senior High School 6–12 hours

Philosophy and Religion

Professor Tinsler (Chairman), Assistant Professor Hodges
Assistant Professor Tsambassis

Field of Concentration (Major)
An interdisciplinary concentration of 52 hours, exclusive of the core course, C-31, 32, 33, required of all students, shall constitute a field of concentration in philosophy and religion and shall include the following courses: Religion 241, 242, 243 (Bible History), Philosophy 201, 202, 203 (Logic and Introduction to Philosophy), Religion 301, 302, and 313 (St. Paul, Church History and Comparative Christianity), and Philosophy 301, 302, 303 (Ethics, Aesthetics, and Philosophy of History), together with a basic course in Sociology and General Psychology, Problems in Religion (440) or Problems in Philosophy (440) in the senior year; plus electives in either philosophy or religion or both to total at least 52 hours.

C-31, C-32, C-33. Historical Study of Philosophy and Religion 3 hours

A study of religion and philosophy as a developing body of convictions by which man has attempted, in every age, to solve the problems and mysteries of life. A one-year unit of study designed and recommended for meeting the Philosophy-Religion requirements for graduation.

Philosophy
In the Department of Philosophy a search is made for a comprehensive view of the universe and of man's place in it. Assumptions are examined and conclusions evaluated. The goal is the achievement of principles of sound reasoning in connection with the living issues of both personal and social life.
College of Liberal Arts

201. Logic
A study of the principles and methods of reasoning with the purpose of improving skill in reasoning. Examines the relations of truth and validity, the uses of language, the sources of fallacies, and the structure of deductive arguments.

202-203. Introduction to Philosophy
A two quarter course initiating the student into the perennial problems of philosophy—its living issues—by means of firsthand acquaintance with the writings of prominent philosophers through the ages.

301. Ethics
A critical study of the various moral theories developed in the Western world in its attempt to formulate a standard for moral behavior applicable to individuals and social groups.

302. Aesthetics
A study of the theories relating to the creation, appreciation and critical evaluation of objects of art. Discusses the various theories of the concept of beauty and related subjects of aesthetic valuation.

303. Philosophy of History
A study of the principles and methods used by historians in their writing of history. Critical discussion of the suggested theories of the meaning of recorded events of human social development.

401. Philosophy of Science
Discussion of the concepts and assumptions of the scientific method of approach to empirical knowledge. Study of the relations of philosophy and science with special attention to the impact of modern scientific developments on metaphysical speculations.

402. Science and Values
Attempts to orient the student towards an integral understanding of life and the appreciation of its possibilities beyond the limited realm of strict scientific investigation. Examines the place of moral, aesthetic, and religious values in a world of facts and technology.

403. American Philosophy
Reading and discussion of selected writings of modern American philosophers, beginning with C. S. Peirce and including W. James, J. Dewey, G. Santayana, A. N. Whitehead and some influential contemporary philosophers.

300 and 400 courses in philosophy have the 200 series in philosophy or the Core course as prerequisites.
440. PROBLEMS IN PHILOSOPHY
1–3 hours
Research or special projects for Seniors prepared to do special work in Philosophy. By arrangement.

RELIGION
Believing that anything which existed in history can be studied historically, the historical (or objective) approach to the study of Religion is used, presenting the figures of Bible History and Religion as real people in real life situations, facing real problems and finding real solutions through their religious insights. The courses are neither sectarian nor dogmatic but, instead, aim to give the student the factual background for his own interpretation of a vital faith.

201. BIBLE CUSTOMS AND MANNERS
3 hours
A study of the social, political and religious customs and folkways of the peoples of the Near East, to provide a background and local color for understanding of the Bible.

202. INTRODUCTION TO RELIGION
3 hours
Presenting religion as the vital experience and growing conviction of real people facing real problems in real life situations, with a careful examination of the contrast between the religion of primitive and of advanced cultures.

203. THE MESSAGE OF JESUS CHRIST
3 hours
The teachings of Jesus Christ, as recorded in the New Testament Gospels, with special attention to their personal and social application of everyday life.

241, 242, 243. BIBLE HISTORY
9 hours
A study of the history of the Hebrew and early Christian peoples of Old and New Testament times, with special reference to the scriptural record, and in relation to the cultural, political and religious influence of their Near East neighbors. The fall quarter traces this history from early times to the reign of Solomon; the winter quarter, from the period of the Divided Kingdom through the Exile and Restoration with special attention to the prophets; the spring quarter, from the Maccabean Period through the times in which Jesus lived and taught, the work and writings of St. Paul, the beginnings of the Early Church, and the writing and selection of the New Testament Scriptures.

301. THE LIFE AND LETTERS OF ST. PAUL
3 hours
A study of the development of the early Church and the relation of St. Paul to this work as revealed in the Book of Acts and in the Letters of Paul.
302. The Christian Church in History 3 hours
A study of the Church in history, with consideration of the significant individuals and events in the Christian Church from the Apostolic Age to the present day and their relation to the course of general history.

313. Comparative Christianity 3 hours
A study of Roman Catholicism, Greek Orthodoxy, and the chief denominations of Protestantism to ascertain their key concepts, chief emphasis and doctrines which distinguish them and constitute their peculiar contribution to Christianity in its current phases.

401. Psychology of Religion 3 hours
A study of the religious behavior of mankind; the need of the spiritual in man’s adjustment to his world, and the close correlation of many religious teachings with the tenets of modern scientific psychology. Applicable toward the field of concentration in either Religion or Psychology.

Prerequisite: Appropriate background in Psychology or Religion or consent of instructor.

402. Philosophy of Religion 3 hours
A constructive study and discussion of the philosophy underlying such religious concepts as God, soul, freedom, prayer, destiny, evil, and immortality. Credit applicable to either Philosophy or Religion.

403. Christian Ethics 3 hours
A study of the theories of value in the field of conduct which have been recognized as “Christian ethics,” with special attention to the presuppositions which underly it. Ethics relating to the individual, the family, society, economics, the state, international relations, war and the like will be studied in the light of the Christian presuppositions.

440. Problems in Religion 1-3 hours
Research or special projects for Seniors prepared to do special work in the field of religion. By arrangement.

Physical Education

Professor Lamb (Chairman), Associate Professor English,
Assistant Professor Nettleton,
Mrs. Pickering, Mr. Gobin

Some form of physical activity is required of all students during their first two years in the University. The nature and amount of work to be taken depends upon physical condition as revealed by a careful
examination and by efficiency tests given at the beginning of the school year. A varied program of elective and required activities is provided, which aims to secure and maintain the highest degree of individual and social efficiency both during and after college life.

The elective courses are both theoretical and practical. A strong intramural sports program is designed to provide some form of activity for nearly every student on the campus.

REQUIRED COURSES

Physical Education two hours a week. One credit each quarter for the first six quarters.

_First Year._ This work is given both out-of-doors and in the gymnasium. It is systematically graded and arranged to fit the needs and interest of the individual. Corrective work, for those who need it, and the fundamentals of natural gymnastics and games are stressed.

_Second Year._ A continuation of the first year program, with greater emphasis on play activities.

101-102-103. **Physical Education** 1 hour each
   Men—Gymnasium and outdoor classes in season, natural gymnastics, informal play. _Freshmen_.
   Women—A course in natural gymnastics including games and sports in season, dancing. _Freshmen_.

201-202-203. **Physical Education** 1 hour each
   Men—Continuation of Course 103 with team games and apparatus added. _Sophomores_.
   Women—A continuation of Course 103. _Sophomores_.

ELECTIVE COURSES

_Intramural Sports._ Ample athletic fields and a splendid gymnasium afford exceptional facilities for an intramural program that is sufficiently broad and varied to offer some form of activity for practically all University students. In their proper seasons, the following sports are offered: football, basketball, free throwing, baseball, speedball, handball, playground ball, volleyball, tennis, wrestling, boxing, track, touch football, golf, horseshoes and swimming.

PROFESSIONAL CURRICULUM FOR TEACHERS

For students who wish to specialize in the field of Health and Physical Education, a four-year professional curriculum is offered, leading
to the degree of Bachelor of Science in Education, and to a special state four-year Provisional Certificate.

101a-102a-103a. PHYSICAL EDUCATION FOR MAJORS 2 hours each

201a-202a-203a. PHYSICAL EDUCATION FOR MAJORS 2 hours each

Courses 101a to 203a inclusive are required of all students majoring or minoring in Physical Education in place of Courses 101 to 203. These Courses consist of natural activities in season, including games, stunts, tumbling, clogging, folk and character dancing, natural dancing, pageantry for women and combat activities for men. These Courses apply toward Physical Education major. Men.

110. PERSONAL AND GENERAL HYGIENE 3 hours

A course designed to cover the various phases of personal hygiene and health from the individual aspect, with emphasis on preventive measures. Each quarter.

112. FIRST AID AND SAFETY 3 hours

Lectures, discussion and practice in the giving of first aid in cases of emergency. Methods of scientific training and conditioning of athletic teams. The American Red Cross First Aid Certificate may be obtained by students who pass a satisfactory examination. (Formerly 158).

113. ADVANCED FIRST AID 3 hours

This is a course designed to give instruction and advanced training in first aid. Upon satisfactory completion of this Course the Advanced First Aid Certificate and Instructor Training Certificate will be awarded.

Prerequisite: First Aid and Athletic Training 212.

120. NUTRITION FOR NURSING 2 hours

A course designed to teach the nurses the importance of nutrition to her own health and that of her patient. Lecture: the study of the role of food in the body, the nutritive requirements of individuals and the modifications required during the stages of development from infancy to later life. Laboratory: theoretical and practical knowledge in meal planning and the selection, care, preparation and service of basic foods.

121. HEALTH EDUCATION 3 hours

The relation of hygiene to home and community life, including a study of sewage disposal, refuse disposal, transmission and control of diseases.

122. HEALTH EDUCATION 3 hours

This Course deals with the health program of the public schools,
and the teaching of habits, attitudes and knowledge conducive to good health.

123. Health Education 3 hours
A course for the special teacher and supervisor of Physical Education, dealing with the sanitation of school buildings, surveys of various school systems, teachers’ health, and other health problems arising in a school system.

133. Theory and Practice of Plays and Games 3 hours
The need, purpose, and function of play in education are studied. Activities adaptable to various levels of the elementary and secondary schools are studied. Two hours of theory and two hours of laboratory per week.

223. Body Mechanics 3 hours
This Course deals with the general body mechanics of the human organism, furnishing the student an opportunity to study and analyze the activities of the physical education program in their relation to coordination and the proper body mechanics.

Prerequisite: Physiology and Anatomy 331 and 332.

301-302-303. Principles and Methods of Physical Education 4 hours
Lectures, demonstrations, and practice. An examination of the principles underlying modern practices in physical education, from the standpoint of general education. The methods used in the natural program of physical education, such as the teaching of fundamental skills of tumbling and stunts, basketball, indoor baseball, speedball, volleyball, handball. Class, three hours; practice, two hours.

321a. Methods in Coaching Football 3 hours
A course covering in detail, equipment, fundamentals of the game, kicking, passing, handling the ball, tackling, blocking, etc.; individual position play; discussion of various types of offensive and defensive formations now in use, and the merits of each; strategy and generalship.

321b. Methods in Coaching for Women 3 hours
This Course is to prepare major and minor students in Physical Education to coach Athletics in secondary schools. The Course covers presentation of technique, basic principles, team play and methods for instruction of hockey, soccer, and speedball.

322. Methods in Coaching Basketball 3 hours
Men—Special emphasis is given to the fundamentals, passing, shoot-
ing, dribbling, feinting, and pivoting; to the various styles of offense and defense used by leading coaches; to equipment; to the conditioning of a team; and to the handling of a team in games. Lectures, reports, demonstration and practice.

Women—Volleyball, basketball, and handball.

323a. Methods in Coaching Baseball 2 hours

This Course covers pitching, catching, batting, fielding, baserunning, individual position and team play in baseball. It takes up the best methods and forms for all of the events in track and field. Lectures, reports, demonstrations, and practice.

Women—Baseball, tennis, track, and field sports.

323b. Methods in Coaching Track 2 hours

This course covers the methods and theory of successful track coaching. It takes up the best methods and forms for all of the events in track and field. Lectures, reports, demonstrations and practice.

Women—Baseball, tennis, track, and field sports.

331-332-333. Advanced Coaching Practice 3—9 hours

These Courses are designed to give students who have had Courses 321, 322 and 323 an opportunity to do actual coaching under supervision, in all sports in season. Hours arranged.

341. Football Officiating 3 hours

This course includes the study of the football rules from the standpoint of the player, coach and official.

342. Basketball Officiating 3 hours

Same description as Course No. 341 except as it applies to basketball officiating.

343. Athletic Training and Conditioning 3 hours

Designed to meet the need of the high school coach. It deals with the training procedures and conditioning of athletic teams for all sports. Special emphasis is placed upon treatment of athletic injuries.

401. Organization and Administration of Physical Education—Men and Women 3 hours

A course dealing with the objectives, principles, and methods of organization and administration of Physical Education in elementary and secondary schools and colleges. It includes management of athletic sports, games, and contests, and intramural athletics.

402. Normal Diagnosis 3 hours

This Course includes recording of personal and family history, methods of making general health examinations, including special
methods of examining the eyes, ears, nose, throat, spine, feet; weighing and measuring, and a limited study of corrective exercises for various postural defects.

403. HISTORY OF PHYSICAL EDUCATION  2 hours
This Course traces the evolution and development of physical education through ancient and modern times. It demonstrates the close relationship existing between certain elements in civilization and the status of physical education in that civilization.

440. PROBLEMS IN PHYSICAL EDUCATION  1-3 hours
This Course deals with specific problems in physical and health education and is open to properly qualified students. Time to be arranged.

480. STUDENT TEACHING  9 hours
See Education 480.

Physics

PROFESSOR BENEDICT (Chairman), PROFESSOR ABELE, MR. MESSICK

The primary aim of the Physics Department is to offer courses that will stimulate scientific thought, train the student to reason from fundamental experimental facts, further the student's desire to continue scientific investigation, and meet the needs of those students who are interested in physics for its cultural or its vocational value. Emphasis is placed on clear concepts, accurate thinking, and the complementary nature of experiment and theory.

The Department aims to give a training sufficiently broad to enable the student to appreciate the physics of popular scientific articles, to teach Physics in the public school, to apply physics in Engineering, Medicine and other sciences, and to pursue graduate work to the best advantage.

The Physics field of concentration must include Courses 301, 303, 313, 333 and at least two hours each of 310, 320, and 330. For those contemplating graduate work in Physics, thirty-five hours of Mathematics should be completed. An introductory course in Philosophy and a reading knowledge of German are strongly recommended. A year of Economics is recommended and a year of general chemistry and physical chemistry should be completed.

221. GENERAL PHYSICS: MECHANICS OF SOLIDS AND FLUIDS  4 hours
222. GENERAL PHYSICS: ELECTRICITY AND MAGNETISM  4 hours
223. GENERAL PHYSICS: SOUND, HEAT AND LIGHT  4 hours
These Courses are open to any persons except Engineers. They are
required for pre-Medical and pre-Dental students. Course 221 and either 222 or 223 are required for pre-Pharmacy students. Three class periods and two hours of laboratory. 221 should precede 222 and 223.

Prerequisite: 1 year of college Mathematics, or permission of instructor.

241. General Physics: Mechanics of Solids and Fluids 5 hours
242. General Physics: Electricity and Magnetism 5 hours
243. General Physics: Sound, Heat and Light 5 hours

A series of courses designed for Engineers and Science majors. Four class periods and two hours of laboratory. 241 should precede 242 and 243.

Prerequisite: High school Physics and Mathematics 133, Calculus to be taken concurrently.

250. Descriptive Astronomy 3 hours

Study of the celestial bodies including distance, motion, size, distribution of planets, stars, spiral nebulae, and modern theories regarding their origin and evolution. Three class periods and one hour of laboratory.

301. Analytical Mechanics 5 hours

A course covering the principles of mechanics as applied to statics; also a study of dynamics of particles and bodies.

Prerequisite: Physics 221 or 241 and Calculus 222. Offered in 1958 and alternate years.

303. Modern Physics 3 hours

A lecture and quiz course involving fundamental questions on the nature of things, such as atomic structure, electron theory, quantum theory, and the theory of relativity etc.

Prerequisite: General Chemistry and Physics 221, 222, 223, or 241, 242, 243.

310. Theory and Advanced Laboratory: Mechanics 1–3 hours

313. Electricity and Magnetism 5 hours

A study of electric and magnetic fields, dielectrics, inductance, capacitance, direct and alternating current circuits and their applications. (Offered in 1954-55 and in alternate years).

Prerequisite: 221, 222 or 241, 242 and Calculus.

320. Theory and Advanced Laboratory: Light, Heat, Sound 1–3 hours

323. Electronics 5 hours

Electron ballistics, thermionic emission, vacuum tubes and charac-
teristics, rectifiers, amplifiers, oscillators, modulators, demodulators, and electron tube instruments. Four class periods and two hours of laboratory.

Prerequisite: Calculus and Physics 241, 242, 243.

330. THEORY AND ADVANCED LABORATORY: ELECTRICITY 1–3 hours
Credit is given in Courses 310, 320, and 330 according to the amount of work done. A quiz is given on assigned readings for each experiment. Not more than three hours credit may be earned in any one of the three quarters. Offered every quarter.

Prerequisite: 241, 242, 243, and Calculus.

333. LIGHT 5 hours
The laws of physical and geometric optics; optical instruments, reflection, refraction, absorption, dispersion, interference, and polarization. A study of lenses, prisms, mirrors, gratings, and instruments used in the study of light. (Offered in 1953-54 and in alternate years)

Prerequisite: Physics 223 or 243 and Calculus.

353. ASTRONOMY 4 hours
Study of the celestial bodies including distance, motion, size, distribution of planets, stars, spiral nebulae, and modern theories regarding their origin and evolution. Four class periods and one hour of laboratory. For students who are interested in a mathematical treatment of the fundamentals of astronomy. The applications of physics to astronomy are stressed.

Prerequisite: One year each of college Physics and Mathematics.

400. ADVANCED LIGHT 3 hours
An Honor Course in physical optics and spectroscopy. There are no regular class recitations. Reports are made by the student in individual conferences. Only superior students may register for this Course. Consent of the Head of the Department is necessary.

Prerequisite: Physics 241, 242, 243, and Calculus.

403. NUCLEAR REACTOR PRINCIPLES 3 hours

Prerequisite: Thermodynamics 301 or equivalent.

410. ADVANCED ELECTRICITY 3 hours
An Honor Course in electricity and magnetism. Requirements the same as for Course 402. Only one Honor Course open each year.
Sociology and Psychology

Professor Markle (Chairman), Professor Barker

Mr. Wire

The purpose of this Department is to give its students an understanding of human relationships, institutions, and social processes; to familiarize them with the nature and causes of social problems; to acquaint them with the facts and laws of behavior and mental life, primarily of man; to enable its students to develop wholesome personalities and to make adequate social adjustments; and to give the students deeper insight into the requirements of intelligent citizenship and useful participation in community life.

In order to complete a field of concentration in this department in the area of Sociology-Psychology, the student shall complete forty-eight hours in sociology and psychology. Twenty-four hours are to be taken in psychology as follows: General Psychology, Applied Psychology, Abnormal Psychology, and Social Psychology. Twenty-four hours are to be taken in sociology as follows: Courtship, Marriage and the Family, Social Factors in Marriage Adjustment, Life and Family Relationships, and fifteen additional hours in sociology chosen from among the other sociology courses. Additional hours in either or both fields may be taken up to a maximum of sixty hours in the department.

In order to complete a field of concentration in this Department with emphasis in Sociology the student must complete forty-five hours in Sociology. In addition fifteen hours must be completed within the Division of Social Sciences, in departments other than the Department of Sociology.

In order to complete a field of concentration in this Department with emphasis in Psychology, the student must complete forty-five hours in Psychology. Psychology majors must complete one year of General Biology.

PSYCHOLOGY COURSES

201-202. General Psychology (a two-quarter unit) 6 hours

A general survey of psychological facts and principles stressing human experience and behavior. Open to qualified freshmen with the consent of the instructor.

203. Experimental Psychology 3 hours

A course designed to acquaint the student with the important areas of experimentation in psychology, with emphasis upon methodology and problems of experimental design.

Prerequisite: Psychology 201, 202.

124
213. Educational Psychology 3 hours
Interpretation of the fundamental psychological facts, principles, and theories applying to education; pupil growth, development and adjustment; problems of learning; relative influence of nature and nurture, statistical procedures.
Prerequisite: Psychology 201, 202 or consent of instructor.

241-242. Psychology for Nursing 5 hours
A general survey of psychological facts and principles stressing human experiences and behavior.

300. Child Psychology 3 hours
Characteristics of the child at different levels of maturity; physical, mental and emotional growth; growth and organization of meanings; control of social and ethical behavior; development of personality.
Prerequisite: Psychology 201, 202 or consent of the instructor.

311-312. Psychology of Personality (a two-quarter unit) 6 hours
A study of the nature and development of personality, and methods of adjustment; discussion of the various theoretical approaches to the psychology of personality.
Prerequisite: 201, 202.

313-314. Tests and Measurements 6 hours
A study of the basic principles, purposes, and psychological problems involved in all areas of psychological tests and measurements.

321-322. Social Psychology (a two-quarter unit) 6 hours
A study of social behavior and social adjustment. The effect of the social environment upon the development of personality. The relation of social and psychological laws to problems of the community.
Prerequisite: Psychology 201, 202.

323. Psychology of Business and Industry 3 hours
A study of the principles and applications of psychology as used in business, industry, and personnel work.
Prerequisite: Psychology 201, 202.

332-333. Applied Psychology 6 hours
The application of psychological principles to problems of modern life; clinical practice; personnel work, home life; education; industry; business law and criminology; medicine; social reform.
Prerequisite: Psychology 201, 202.

411-412. Counseling and Guidance 3 hours
A study of the basic psychological principles involved in educational, vocational, and personnel counseling. The application of these principles to a sound guidance program.
421-422. Abnormal Psychology (a two-quarter unit) 6 hours
Study of behavior pathology; the neuroses and psychoses; various theoretical approaches to the problem of etiology.
Prerequisite: Psychology 201, 202.

423. Psychology of the Exceptional Child 3 hours
The classification of the non-typical school child; the use of the school and other resources for meeting his needs.
Prerequisite: Psychology 201-202 and 300 or 213.

424. Psychology of the Gifted Child 3 hours
An analysis of the psychological problems of the gifted child.
Prerequisite: Psychology 201-202 and 300 or 213.

440. Psychological Problems 1-3 hours
Minor investigation. Open only to qualified seniors. By arrangement.

Sociology Courses

201. Courtship, Marriage, and the Family 3 hours
A practical course in the study of adjustment in courtship, preparation for marriage and family living.

202. Social Factors in Marriage Adjustment 3 hours
An analysis of the factors in modern life affecting the stability of the family. A critical study of the biological and social factors in marital adjustment.

203. Life and Family Relationships 3 hours
A study of the effects of early family relationships and the individual’s day by day experiences upon the child in American society.

241-242. Sociology for Nursing 5 hours
A study of the phenomena of human relations, including the nature and import of sociology, socialization, social ideals and social control.

300. Population Problems 3 hours
The composition of population according to sex, age, color; its distribution in the territory of the U.S.; fertility, mortality. The problems of mate selection, birth control, standard of living, and migrations are discussed.

301. Social Disorganization 3 hours
The impact of social change and major lags leading to social breakdown; population, race, family, rural and urban problems.

302. Social Pathology 3 hours
Social pathology, as it concerns our own society, including the study
of such problems as poverty, mental disease, crime, prostitution, narcotics, alcoholism, public health and suicide.

303. Sociology of Conflict  3 hours
   A study of conflict in human behavior and in social change; class, race, and industrial conflict in contemporary society; sociological aspects of war.

321. Criminology  3 hours
   A consideration of the problems of crimes and criminals. Special attention is given to the factors conducive to the making of criminals.

322. Penology  3 hours
   An analysis of the theories of punishment; historical and modern treatment of criminals; modern policies for prevention of crime, probation and parole.

323. Juvenile Delinquency  3 hours
   A study of the factors associated with juvenile delinquency, characteristics of delinquents, juvenile court procedures, correctional training in institutions, plans and programs for the prevention of delinquency.

331. Cultural Anthropology  3 hours
   A study of preliterate culture, its relation to geography, biology, and psychology. Study of primitive religion, family patterns, and cultural variations.

400. Human Geography  3 hours
   The interaction of man and his physical environment.

402. Social Control  3 hours
   A study of the methods and agencies of social control in contemporary society.

403. Race Relations  3 hours
   A study of the phenomena which arise when groups of people who differ radically or culturally come into contact with one another.

411. Rural Sociology  3 hours
   Composition of rural population, the rural family and standards of living, rural institutions and social processes, fundamental differences between rural and urban groups.

412. Urban Sociology  3 hours
   A study of cities, their growth, ecology, population trends, personality types, characteristics, attitudes and institutions.
413. **Industrial Sociology** 3 hours
A study of the social organization of industry and human relations in the work plant. Problems of conflict and cooperation in the work group and the relation between the work group and the community are emphasized.

421. **Public Opinion and Propaganda**
An analysis of the nature and sources of contemporary public opinion and the nature, extent, and direction of propaganda in contemporary society.

422. **Marriage and Family Counseling: Premarital** 3 hours
A course dealing with the development of premarital counseling together with the details of its practice. Emphasis upon role playing in a counseling situation. This course is open only to students with the approval of the instructor.

*Prerequisite:* 201.

423. **Marriage and Family Counseling: Marital** 3 hours
A course dealing with the development of marital counseling together with the details of its practice. Emphasis upon role playing in actual counseling situations. This course is open only to students with the approval of the instructor. *(Formerly 404)*

*Prerequisites:* 202 and 422.

430. **Conference Leadership in Human Relations**
A course designed to aid participants in better use of conference leading techniques by furnishing them with basic information regarding techniques and by offering them an opportunity to lead supervised practice discussion.

440. **Problems in Sociology** 1–3 hours
Minor investigation. Open only to qualified Seniors by arrangement.

**GEOGRAPHY COURSES**

400. **Human Geography** 3 hours
A study of the adaptation of man to his environment.

431, 432, 433. **Global Geography** 3 hours
The study of world geography to the end of discovering the relationship of the physical environment to the economic, social and political problems of mankind.

Emphasis in 421 is upon Latin America; in 422, United States and Canada; in 423, U.S.S.R.
CIVIL ENGINEERING
Freshman Drawing (above)
Testing Materials – Torsion (below)

Engineering Building (above)
Engineering Lab (below)
College of Engineering

LAWRENCE HARRY ARCHER, Dean

ACADEMIC RECOGNITION

The College of Engineering of Ohio Northern University is on the list of approved engineering colleges of the Ohio State Board of Registration for Professional Engineers and Surveyors. All of the departments, Civil Engineering, Electrical Engineering, and Mechanical Engineering, of the College are accredited by the Engineers' Council for Professional Development.

PURPOSE

In keeping with the avowed purpose of Ohio Northern University, it is the aim of the College of Engineering to develop in the student a high standard of undergraduate proficiency in the areas of subject matter basic to all engineering together with such technical information and education in the essentials of his chosen branch of the profession as will enable him to meet the highest standards of professional performance and citizenship rightfully to be expected of the engineering graduate.

HISTORY

The history of the College of Engineering of Ohio Northern University dates from the graduation of its first class in 1882 when one man was graduated with the degree of Civil Engineer. From that date the growth was rather irregular with graduates fairly constant running above and below twenty but growing slightly until 1898 when an additional department, the Electrical Engineering Department, graduated its first "Electrical Engineer." In that year the total enrollment was 63 with a graduating class of eleven, nine Civil Engineers and two Electrical Engineers. In 1904 the present Department of Mechanical Engineering had its first graduate.

During the seventy-five years of its existence the College of Engineering of Ohio Northern University has had more than twenty-four hundred graduates. Always has the student been in small classes where individual attention was received. Today this policy is continued. The interests of the student are the first consideration of staff and faculty at Ohio Northern University.
ADMISSION

An applicant for admission to the College of Engineering should write for application forms to the Admissions Office of the University or to the Dean, College of Engineering. See "How to Apply for Admission," page 13 of this bulletin.

Candidates of good moral character may apply for admission upon one of the following plans:

1. Certificate. Each applicant must have the following course distribution or the equivalent from an accredited high school or academy.

   English ........................................... 4 years
   Mathematics .................................... 4 years
   Science .......................................... 4 years
   Latin or other language ..................... 2 years
   Others .......................................... 2 years

In this distribution in mathematics, two units must be in algebra; one and one-half, geometry; and one-half, trigonometry. The sciences should include general science, biology, chemistry, and physics, with chemistry and physics required.

Those people who meet the general University admission requirement and are found to be deficient in mathematics whether it be in actual units or in background, will be required to make up the material without college credit. This will take at least one Summer School above the normal requirement and in most cases result in a five-year program.

So that proper placement according to background and ability can be made, a refresher course in mathematics and science will be held each year for first year students. See the University calendar for specific dates. All entering first-year students are urged to attend.

2. Examination. Candidates who are not graduates of accredited high schools or are deficient in some of the units for admission may be admitted upon examination. At least one summer session will be required of the students who must make up deficiencies in entrance credits.

3. Advanced Standing. An applicant from another college seeking advanced standing must present evidence of honorable dismissal and an official transcript of his college record. Some credit may be allowed for practical experience in Drafting and Shop Work. Applicants for such credit must submit a satisfactory statement from their
employer giving time of service, nature of work, name and address of employer.

Advance credit from other institutions of higher learning will not be given for more than 162 quarter hours (108 semester hours). The work must be "C" level or better.

4. Special Student. Mature persons not candidates for a degree may be admitted, if on consultation the Dean is satisfied that they have sufficient preparation to pursue the work successfully. Such applicants are classified as Special Students. Upon successful completion of their work, a certificate showing the course of study pursued and the amount of work covered is presented to them.

The standard load in the College of Engineering is listed under each department. Extra hours based upon scholarship attainments may be granted by the Dean upon recommendation of the student's advisor.

PROBATION

Any student making less than 2.0 quality points per scheduled hour for the quarter is warned of his low academic standing. If the student should again fail to meet this standard in the quarter for which he is put on warning, he is put on probation for the following quarter of residence with a reduced schedule. Failure to meet this academic requirement of 2.0 for such reduced schedule may subject the student to dismissal.

CLASSIFICATION

The minimum requirements for Sophomore standing are forty-six credit hours of which fifteen hours must be in freshman mathematics and an accumulative point average of 2.0; for Junior standing, ninety-seven credit hours of which thirty hours must be in mathematics, fifteen hours in physics which presupposes calculus either concurrently or as a prerequisite, and an accumulative point average of 2.0; for Senior standing, 162 credit hours and an accumulative point average of 2.0.

GRADUATION AND DEGREES

Two hundred thirty-eight hours of which six are in physical education and six in chapel are required for graduation. Each student must participate in his professional and technical student organization while
in attendance. He must have a scholarship rating of at least two quality points for each credit hour scheduled. A student is not permitted to be a candidate for more than one degree at any one time.

A student must spend his Senior year in residence and must take at least forty-five quarter hours for final credit toward graduation.

The University is empowered to grant the customary academic degrees, which in the College of Engineering are Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, and Bachelor of Science in Mechanical Engineering.

REGISTRATION AS A PROFESSIONAL ENGINEER

In order to practice as a Professional Engineer after graduation it is necessary to become registered by the state. Complete information on this subject can be obtained by corresponding with the College of Engineering of Ohio Northern University or by writing to the Secretary of the Board of Registration for Professional Engineers and Surveyors, 21 West Broad Street, Columbus, Ohio.

Since four years of practical experience in Engineering are required beyond the college education before full registration as a Professional Engineer can be obtained, this item necessarily becomes an important factor in choosing Professional Engineering as a career.

ENGINEERING BUILDING

The College of Engineering, staff, and faculty are housed in a three story, thirty-eight room brick structure. The building has special provision for well-equipped drafting rooms, laboratories, and classrooms.

Some of the laboratories, rooms, and shops are as follows: Testing Materials Laboratory, Fluid Mechanics Laboratory, Concrete Laboratory, Soils Laboratory, Steam Laboratory, Internal Combustion Engine Laboratory, Air-Flow Laboratory, Heating and Ventilating Laboratory, Electronics Laboratory, A.C. Power Laboratory, D.C. Power Laboratory, Surveying Supply, Senior Design Room, Visual Aid Room, Freshmen Drawing Room, Machine Shop, Carpenter Shop, and Tool Crib.

PROFESSIONAL AND TECHNICAL ORGANIZATIONS

All engineering students are expected to participate in the professional society and their technical organization in order to complete the graduation requirements. Satisfactory completion of this portion of the graduation requirement is certified by the respective organization advisor.

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The student branch of the Ohio Society of Professional Engineers embraces all departments of the College of Engineering. Professional Standards, Professional Registration, Ethics and the Engineer's place in the community are some of the things inculcated by the student branch of the Ohio Society of Professional Engineers which is an affiliate of the National Society of Professional Engineers.

The Ohio Northern Student Chapter of the American Society of Civil Engineers holds monthly meetings. All Civil Engineering students are eligible for membership. Activities of A.S.C.E. are helpful in rounding out the student's program. This group is affiliated with the Toledo Section of the American Society of Civil Engineers.

The Institute of Radio Engineers—American Institute of Electrical Engineers Joint Student Branch holds monthly meetings. Topics pertinent to the field of Electrical Engineering are presented and discussed at their meetings. All students interested in Electrical Engineering are eligible for membership. The student chapter enjoys a very close association with the Lima Section of the American Institute of Electrical Engineers.

The Ohio Northern Student Section of the American Society of Mechanical Engineers is organized to sponsor the discussion of mechanical engineering and its allied fields. Meetings are held once each month. Members are urged to join one or more of the several national and international technical societies in this field. The student section is allied with the Toledo Section of the American Society of Mechanical Engineers.

PRE-ENGINEERING CURRICULA

Since the first two years of any particular curriculum in engineering are practically the same, it is possible to offer pre-engineering in all fields. As soon as the pre-engineering student decides where he or she will get his or her degree, the program is varied so that it will conform to the schedule as listed in the catalog of that institution. All pre-engineering students are enrolled in the College of Engineering.

FRESHMAN AND SOPHOMORE ENGINEERING CURRICULUM

PROFESSOR ARCHER, ASSISTANT PROFESSOR HILLERY,
LIBERAL ARTS FACULTY

During the first one and two-third years all Engineering students follow the same general program. All beginning Sophomores and
transfer students who have not had the first course in Surveying are required to attend the Surveying Camp. Except for advisory purposes, it is not necessary for the student to select a branch of Engineering until the start of the third quarter of the Sophomore year.

No sharp line of distinction can be drawn in the fundamental training of Civil, Chemical, Electrical and Mechanical Engineers for the reason that the sciences basic to Engineering — Mathematics, Physics, Chemistry, and some Engineering Science — are essential in all branches of Engineering.

**FRESHMAN YEAR**

<table>
<thead>
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<th>Course</th>
<th>FALL</th>
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<tr>
<td>Physical Education (P.E. 101, 102, 103)</td>
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<td>(1)</td>
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<tr>
<td>Math (131, 132, 133)</td>
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<td>Chemistry (111, 112, 113)</td>
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<tr>
<td>English (C-1, 2, 3)</td>
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<tr>
<td>Social Science or Humanities**</td>
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<td>3</td>
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<tr>
<td>Orientation (E. 101, 102, 103)</td>
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<tr>
<td>Engineering Graphics (E. 111, 112, 113)</td>
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**SURVEYING CAMP**

Surveying I (C.E. 211)

**SOPHOMORE YEAR**

<table>
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<tbody>
<tr>
<td>Physical Education (P.E. 201, 202, 203)</td>
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<td>Math (221, 222, 223)</td>
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<td>Engineering Physics (241, 242, 243)</td>
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<td>Philosophy (C-31, 32, 33)</td>
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<td>Professionalism (E. 201, 202)</td>
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<td>Shop (E. 211, 212, 213)</td>
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<tr>
<td>Elective or Geology (C.E. 221 for C.E.)</td>
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<td>3 or 3 or 3</td>
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<tr>
<td>Speech (271)*</td>
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<td>Surveying II (C.E. 213) for C.E.</td>
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<tr>
<td>Electric and Magnetic Circuits (E.E. 213) for E.E.</td>
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<tr>
<td>Manufacturing Processes and Metallurgy (M.E. 202, 203) for M.E.</td>
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<td><strong>Total</strong></td>
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* E.E. students take speech in Fall; C.E., Winter; M.E., Spring.
** See page 142 for details.
CIVIL ENGINEERING

PROFESSOR ARCHER, ASSISTANT PROFESSOR HILLERY,
DR. GUNAJI, DR. SCHADLER

Although many of the former divisions have grown into separate departments, Civil Engineering offers greater opportunities than ever before. The Civil Engineer conceives, designs, and supervises the building of projects, coordinating and utilizing all resources for all types of developments. He works in many broad fields of specialization such as: Structural Engineering, Construction Engineering, Highway and Transportation Engineering, Sanitary Engineering, Soil Engineering, Surveying, Mapping, City Managing, Consultant in Engineering, etc.

The Department is supplied with high grade instruments and appliances necessary for first class instruction and practice. The laboratories are well equipped, the drafting room large and modern, the scientific library excellent.

The Civil Engineering Department offers laboratory work in Testing Materials, Concrete, Soil Mechanics and Fluid Mechanics, as well as field work in Surveying.

In the testing of materials, laboratory equipment is available which enables the student to perform a wide variety of standard ASTM tests. This laboratory has screw gear universal testing machines, hydraulic testing units, a pendulum type torsion machine, a universal impact tester, a high speed rotary fatigue testing machine, hardness testers, and other equipment including extensometers, compresometers and SR-4 strain gages.

The Concrete Laboratory provides for the conducting of many of the tests, standardized by ASTM and AASHO, for concrete materials, cement and mortars. A high and low temperature humidity chamber, a sieve shaker with standard sieves, a motor driven concrete mixer, concrete beam and cylinder testing machines, and a flow table together with the usual small pieces of equipment are located in this laboratory.

The Soil Mechanics Laboratory has a portable unconfined compression machine, drying oven, water bath, soil dispersion apparatus, C.B.R. apparatus, sampling equipment, permeameter, compaction outfit, direct single shear apparatus, double shear equipment, triaxial apparatus with pore pressure attachment, and Proctor and Howard miniature moisture density apparatus.

In the Fluid Mechanics Laboratory, water under constant head is supplied from a standpipe to weirs, venteri meters, orifices, displace-
ment meters, a friction board, a flume and other equipment. Pumps of various designs are available for use on a pump test stand.

A great number of varied field exercises in surveying is provided by numerous transits, levels, plane tables, alidades, theodolites and the smaller equipment necessary for such work.

The Senior Design Room has a Friden electric calculator and several models of trusses.

The aim of this Department is to give the student a well-rounded Engineering education and to instill within the student the idea of knowing how, knowing why, and doing the best engineering job possible for his client for the least amount of money, always abiding by the Code of Ethics of the Professional Engineer.

See page 136 for the program of the Freshman and Sophomore years.

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**JUNIOR YEAR**

<table>
<thead>
<tr>
<th>Course</th>
<th>FALL</th>
<th>WINTER</th>
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<tr>
<td>Statics and Mechanics of Materials I, II (C.E. 301, 302, 303)</td>
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<tr>
<td>Theory of Structures I (C.E. 313)</td>
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<tr>
<td>Geology, Fluid Mechanics, and Highways (C.E. 321, 322, 323)</td>
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<tr>
<td>Route Surveying (C.E. 331)</td>
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<td>Engineering Analysis and Plain Concrete (E. 301, C.E. 333)</td>
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<td>Thermodynamics and Dynamics (M.E. 301, 322)</td>
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**SENIOR YEAR**

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<th>FALL</th>
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<tbody>
<tr>
<td>Theory of Structures II, III (C.E. 401, 402)</td>
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<tr>
<td>Structural Design I, II, III (C.E. 411, 412, 413)</td>
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<tr>
<td>Reinforced Concrete Theory I, II, III (C.E. 421, 422, 423)</td>
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<tr>
<td>Reinforced Concrete Design I, II (C.E. 422a, 423a)</td>
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<td>2</td>
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<tr>
<td>Soil Mechanics, Sanitary Engineering, and Cost Analysis (C.E. 431, 432, 433)</td>
<td>4</td>
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<tr>
<td>Electrical Engineering I, II, III (E.E. 301, 302, 303)</td>
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<tr>
<td>Engineering Law (E. 403)</td>
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<td>Social Science or Humanities**</td>
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</table>

** See page 142 for details.

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ELECTRICAL ENGINEERING

Professor Klingebenger, Professor Alden, Mr. Geyer

Electrical Engineering is that segment of engineering whose core is built around the science of electricity and magnetism. The science of electricity and magnetism treats of the laws governing the generation, transmission, and utilization of electrical energy in either very large or minute amounts for useful purposes. Among others, the applications may take the form of radio, telephone, telegraph, television, radar, sonar, electric computers, electric control, heating, lighting, and versatile development of mechanical motion.

The Electrical Engineering curriculum is arranged in a manner to offer a coordinated program of study whereby the student may obtain both a mental understanding and scientific working habits which will enable him to embark upon a successful professional career. In the third quarter of the sophomore year, the student embarks upon the Electrical Engineering sequence by studying the fundamentals of electricity and magnetism. From this and subsequent foundation courses which cover the basic principles of electric circuits, electronics, and machinery, the sequence branches into more specialized courses in communication and power.

The class activities are supplemented by experimental work in the laboratories. The two phases of study program are closely correlated so that one will augment the other.

The Electrical Engineering laboratories occupy three large adjoining rooms on the main floor of the Engineering Building. Each of the three laboratories is equipped with the most modern power-supply switchboards. The instrument room for the Electrical Engineering laboratories is equipped with an abundance of the newest and finest indicating instruments and other testing and measuring equipment. The Power Laboratory contains a number of transformers of convenient size, duplicate AC and DC generators and motors of various types, including those of the newest designs. The Communication Laboratory is equipped with a wide variety of test equipment, numerous bridge-type instruments, portable cathode ray oscillographs, and 4-element recording oscillographs.

Graduates of the Electrical Engineering curriculum may find employment in any of the following fields: radio communications, television, telephone and telegraph systems, electronics, development of
electrical equipment and controls for aircraft, construction and operation of generating stations and electric power systems, installation and operation of equipment in industrial plants, design of power apparatus, manufacture and sale of electrical equipment, rural electrification, application of Electrical Engineering to agriculture, geophysical exploration in the petroleum industry, research in any of these specialized fields and teaching Electrical Engineering.

See page 136 for the program of the Freshman and Sophomore years.

### JUNIOR YEAR

<table>
<thead>
<tr>
<th>Course Description</th>
<th>FALL</th>
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<tr>
<td>Alternating Current Circuits I, II and Communication Circuits I (E.E. 311, 312, 313)</td>
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<tr>
<td>Electronics I (E.E. 323)</td>
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<tr>
<td>Statics &amp; Mechanics of Materials I (C.E. 301, 302)</td>
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<tr>
<td>Thermodynamics &amp; Heat Transfer (M.E. 301, 303)</td>
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<td>Engineering Analysis (E. 301)</td>
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<tr>
<td>Dynamics (M.E. 322)</td>
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<td>Nuclear Physics (403)</td>
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### SENIOR YEAR

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<th>Course Description</th>
<th>FALL</th>
<th>WINTER</th>
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<tr>
<td>Communication Circuits II and Electric and Magnetic Waves (E.E. 411, 412)</td>
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<td>Electronics II, III, and IV (E.E. 421, 422, 423)</td>
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<td>Electrical Machinery I, II, and III (E.E. 431, 432, 433)</td>
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<td>Transient Circuits, Automatic Control Systems I &amp; II (E.E. 441, 442, 443)</td>
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<td>Technical Elective</td>
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** See page 142 for details.
Mechanical Engineering is a general term which may include the specialized fields of Applied Mechanics, Automotive Engineering, Heat Transfer, Machine Design, Materials Handling, Power, Production Engineering, and many others.

The mechanical engineer today is faced with such vital problems as space flight, automation, ever greater demands on the use of existing materials and mechanisms in missiles, automotive, electronic, and other fields, and the design of equipment necessary to produce them.

In order to meet this challenge, the mechanical engineer must have a thorough knowledge of fundamental scientific principles and be adept in the use of mathematics. In addition, he must develop his creative ability. To complete his technical education, he must acquire knowledge of certain manual arts such as materials processing and the instrumentation and testing of a wide range of materials, machines, and equipment such as internal combustion engines, heat transfer apparatus, etc.

The laboratories are well equipped to supplement the classroom instruction in the fundamentals involving the uses of energy and power. They also provide instruction in the proper procedures and techniques in instrumentation, the development of test and research projects, as well as the development of accurate technical reporting.

The Steam Power Laboratory has a steam boiler, pump, engine, and two turbines with other necessary accessories for tests of each unit. The Engine Laboratory contains dynamometers for automotive engines and a single cylinder test engine. In addition, there are several Diesel-generator sets available for testing and research work. The Heating and Ventilating Laboratory contains space heating systems and accessories. The Fluids Laboratory consists of fans, blowers, compressors, and pumps; fuel and lubricant test facilities are also provided.

See page 136 for the program of the Freshman and Sophomore years.
College of Engineering

JUNIOR YEAR

<table>
<thead>
<tr>
<th>Course</th>
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<th>WINTER</th>
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<tr>
<td>Thermodynamics, Fluid Mechanics and Heat Transfer (M.E. 311, 312, 313)</td>
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<tr>
<td>Statics, Mechanics of Materials (C.E. 301, 302, 303)</td>
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<td>Dynamics, Kinematics of Machines (M.E. 322, 323)</td>
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<td>M.E. Laboratory I, II, III (M.E. 331, 332, 333)</td>
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SENIOR YEAR

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<th>FALL</th>
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<td>Design of Machine Elements I, II, and</td>
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<td>Machine Design (M.E. 411, 412, 413)</td>
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<td>M.E. Laboratory IV, V, VI (M.E. 431, 432, 433)</td>
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<td>Fluid Dynamics and Turbomachines (M.E. 441, 442)</td>
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<td>Electrical Engineering I, II, III (E.E. 301, 302, 303)</td>
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<tr>
<td>Social Science or Humanities**</td>
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* Majority of the M.E. seniors or 10 (whichever is smaller) must choose one of the M.E. courses in order for it to be offered.

** Social Science, Humanities, or Elective should be taken at the 100 or 200 course level for the first year; 200 for the second year; 200, 300, or 400 for the third and fourth years. No more than 9 hours can be taken from any one department as an elective. Eighteen of these hours must be in social science and nine, in humanities outside of Philosophy and Religion.
DESCRIPTION OF COURSES

GENERAL ENGINEERING

100. High School Refresher for Beginning Engineering Students.  
No credit

For a period of three weeks, five days per week, eight hours per day, a review of high school mathematics, that which is necessary to start the college mathematics, is offered previous to the opening of the fall quarter. All beginning freshmen find the systematic review of value in getting started in the college mathematics. The course includes topics in algebra, geometry, and trigonometry.

Students who do not place sufficiently high on mathematics placement tests during Freshman Week are required to take this course during the fall quarter.

101. Orientation of Engineering Students. (1+0)*  1 hour

102. Orientation of Engineering Students. (1+0)  1 hour

103. Orientation of Engineering Students. (1+0)  1 hour

Schedules, irregularities in schedules, graduation requirements, class preparations, problem solutions, taking of tests, slide rule, background of various branches of engineering, technical and professional organizations, and professionalism are covered. The purpose of this course is to help the student to make the transition from high school to college as well as the proper orientation in the profession.

111. Engineering Graphics I. (1+6)  3 hours

Use of instruments, applied geometry, lettering, orthographic projection, sketching, pictorial drawing, dimensioning.

112. Engineering Graphics II. (1+6)  3 hours

Continuation of E. 111. Machine elements, working drawings, welding symbols, nomographs. Projects in the main fields of engineering are used.

Prerequisite: E. 111.

113. Engineering Graphics III. (1+6)  3 hours

Descriptive Geometry, advanced orthographic projections, problems of point, line, plane and curved surfaces, developments, intersections and perspective.

Prerequisite: E. 111.

*Note: (1+0) indicates one hour lecture per week and 0 indicates the number of hours spent in laboratory per week.
201. **Professionalism I.** (1+0)  
1 hour  
Continuation of Orientation of Engineering Students supplemented with lectures by practicing Professional Engineers.

202. **Professionalism II.** (1+0)  
1 hour  
Continuation of Engineering 201 supplemented with staff lectures on the various branches of the engineering profession.

211. **Pattern Making and Foundry.** (0+3)  
1 hour  
Basic foundry processes; making a pattern, making a mold, pouring a casting, cleaning, and finishing.

212. **Sheet Metal and Welding.** (0+3)  
1 hour  
Sheet metal fabrication and welding as applied to welded fixtures, etc.

213. **Machine Shop.** (0+3)  
1 hour  
Machining operations and practice, a complete project involving drilling, shaping, turning, milling, and finishing.

300. **Engineering Economy.** (3+0)  
3 hours  
The importance of engineering economy is emphasized. Principles of cost comparison are illustrated by discussing particular cases. Planning economy studies, investigating the time element in economy, and techniques are covered.

301. **Engineering Analysis.** (3+0)  
3 hours  
The professional method of dealing with engineering problems; application of professional method; the understanding of principles fundamental to engineering; translation into mathematics; solution of some ordinary differential equations; checking and interpretation of the mathematics are covered.  
Prerequisite: Physics 243 and Mathematics 223.

403. **Engineering Law.** (3+0)  
3 hours  
Legal principles of vital interest to engineers. General nature of law and the working of the judicial system. Contracts, agencies, sales, negotiable instruments, workmen's compensation, mechanics liens, property, patents, and expert testimony are included.
CIVIL ENGINEERING

211. SURVEYING I. (3+6) (Surveying Camp) 5 hours
Prerequisite: Mathematics 131.

213. SURVEYING II. (3+6) 5 hours
Land surveys, advanced topographic surveys with transit, stadia and plane table, control surveys. Use of co-ordinate systems. Triangulation and precise leveling; descriptions of aerial survey methods. Hydrographic surveying.
Prerequisite: C.E. 211.

221. GEOLOGY. (3+0) 3 hours
Prerequisite: General Chemistry.

301. STATICs. (4+0) 4 hours
A course covering the principles of mechanics as applied to statics. The course includes definitions and general principles, systems of coplanar concurrent forces, coplanar parallel forces, coplanar non-concurrent forces, concurrent forces in space, three force members, parallel forces in space, non-concurrent non-parallel forces in space, friction, centroids and centers of gravity, and moments of inertia of areas.
Prerequisite: Mathematics 223 and Physics 241.

302. MECHANICS OF MATERIALS I. (4+3) 5 hours
General principles of stresses, elastic limit, shear, riveted joints, torsion, beams, shear and moment diagrams for beams, stresses in beams, deflection in beams by Double Integral and Area-Moment methods. Column theory and column formulas used by engineers. Laboratory.
Prerequisite: Mathematics 223 and C.E. 301.

303. MECHANICS OF MATERIALS II. (5+0) 5 hours
Beams with more than two supports, shear in beams, special beams, bending combined with tension or compression, resilience in bending
or shear, combined stresses, theory of elastic limit or failure, curved beams and hooks.

Prerequisite: C.E. 302.

313. Theory of Structures I. (3+0) 3 hours
An introductory course covering by analytical methods the determination of reactions, moments, shears, and stresses in simple trussed structures for fixed and moving loads. Introduction to influence lines.

Prerequisite: C.E. 303 or concurrent therewith.

322. Fluid Mechanics. (4+3) 5 hours
Mechanics of compressible and incompressible liquids, fluid statics, flow and measurement of fluids in pipes and open channels, and hydraulic machines. Laboratory.

Prerequisite: Physics 243, Mathematics 223, and C.E. 301.

323. Highways and Transportation. (3+0) 3 hours
Design, construction, and maintenance of earth roads, paved roads, and streets. Administration and organization of highway systems. Introduction to Traffic Engineering, airports, waterways, docks and harbors.

Prerequisite: C.E. 213 and C.E. 321.

331. Route Surveying. (3+6) 5 hours
Highway and railroad location, simple curves, compound and reverse curves, spiral curves, vertical curves, earthwork measurement, and computations. Formerly C.E. 333.

Prerequisite: C.E. 213.

333. Plain Concrete. (1+3) 2 hours

401. Theory of Structures II. (3+0) 3 hours
An extension of C.E. 313. Covering the theory of uniform moving loads and determining the stresses in highway bridges. Analytical methods of determining stresses due to fixed and moving loads in simple span railway bridge trusses, use of influence lines.

Prerequisite: C.E. 303 and C.E. 313.

402. Theory of Structures III. (3+0) 3 hours
Statically indeterminate structures.

Prerequisite: C.E. 401.
411. STRUCTURAL DESIGN I. (0+6) 2 hours
An introductory course covering by graphical methods the determination of reactions, moments, shears, and stresses in simple trussed structures. Design steel roof truss and make drawings of same.
Prerequisite: C.E. 303 and C.E. 313.

412. STRUCTURAL DESIGN II. (0+6) 2 hours
A continuation or extension of C.E. 411 covering the determination of stresses due to fixed and moving loads on a plate girder railway bridge with design and drawings of the same.
Prerequisite: C.E. 401 and 411.

413. STRUCTURAL DESIGN III. (0+6) 2 hours
A continuation of C.E. 412. Design multi-story building including wind effect. Framing plan and design of a school or other appropriate building. Willot-Mohr diagrams for truss deflection.
Prerequisite: C.E. 402 and 412.

420a THEORY OF STRUCTURES IV. (3+0) 3 hours
A general course dealing with movable and long span bridges. Covering bascule, vertical-lift, swing bridges; also continuous, cantilever, and suspension bridges.
Prerequisite: C.E. 402.

421. REINFORCED CONCRETE I. (3+0) 3 hours
Theory of concrete beams, girders, slabs, columns, and footings.
Prerequisite: C.E. 303.

422. REINFORCED CONCRETE II. (2+0) 2 hours
Continuation of C.E. 421.
Prerequisite: C.E. 421.

422a REINFORCED CONCRETE DESIGN I. (0+6) 2 hours
Design of Concrete Structures.
Prerequisite: C.E. 421.

423. REINFORCED CONCRETE III. (2+0) 2 hours
Prerequisite: C.E. 422.

423a REINFORCED CONCRETE DESIGN II. (0+3) 1 hour
Continuation of C.E. 422a with further designs in concrete.
Prerequisite: C.E. 422 and 422a.

431. SOIL MECHANICS. (3+3) 4 hours
An introduction to soil engineering, physical properties of soils as affecting engineering design and construction, soil sampling, mechan-
Physics of soil masses, stability, settlement, types of foundations, and laboratory soil tests.

Prerequisite: C.E. 303 and C.E. 321.

432. Water Supply and Sanitary Engineering. (4+0) 4 hours

General course on sewerage systems, disposal of sewage, requisites of a water supply, quality of water, studies of rainfall and runoff, water treatment, and inspection trip.

Prerequisite: C.E. 322.

433. Cost Estimating. (2+3) 3 hours

Specifications, economical construction methods, quantity take-offs, cost analysis, and cost estimating as applied to various engineering projects.

Prerequisite: C.E. 412, 422a for senior C.E. students. All others, permission of instructor.

450a Projects. 1–5 hours

Practical projects involving calculation, design, drafting, engineering judgment, and skill in construction or repair work. Reference work is used to a great extent.

a: Taught upon sufficient demand.

ELECTRICAL ENGINEERING

213. Electric and Magnetic Circuits. (4+3) 5 hours

A study of the fundamental laws of electricity and magnetism and their application to electric and magnetic circuits. Topics studied include: resistance, Ohm's and Kirchhoff's laws, batteries, electrical instruments and measurements, magnetic fields, electromagnetic forces, magnetic circuits, inductance, electric fields, and capacitance. Lectures, recitations, computing, and laboratory periods.

Prerequisite: Physics 242.

301. Electrical Engineering I. (2+3) 3 hours

For students not majoring in Electrical Engineering. The study of the principles of electric and magnetic circuits and the principles of operation of direct-current machinery. Lectures, recitations, computing, and laboratory demonstration periods.

Prerequisite: Physics 242.

302. Electrical Engineering II. (2+3) 3 hours

For students not majoring in Electrical Engineering. This course comprises a study of the principles of single and polyphase circuits and
the principles of alternating-current machinery. Lectures, recitations, computing, and laboratory demonstration periods.

Prerequisite: E.E. 301.

303. ELECTRICAL ENGINEERING III. (2+3) 3 hours
For students not majoring in Electrical Engineering. A study of electronic and control devices. Lectures, recitations, computing, and laboratory demonstration periods.

Prerequisite: E.E. 302.

311. ALTERNATING CURRENT CIRCUITS I. (4+3) 5 hours
A fundamental course in alternating current theory. Phasor representation, the calculation of impedance in series and parallel circuits, and network theorems are studied. Lectures, recitations, computing, and laboratory periods.

Prerequisite: E.E. 213.

312. ALTERNATING CURRENT CIRCUITS II. (4+3) 5 hours
A continuation of Alternating Current Circuits I. Balanced and unbalanced polyphase circuits, power measurements by n-1 wattmeters, synthesis of non-sinusoidal waves, and symmetrical components. Lectures, recitations, computing, and laboratory periods.

Prerequisite: E.E. 311.

313. COMMUNICATION CIRCUITS I. (4+0) 4 hours
Theory and operation of transmission lines and circuits at communication frequencies. Topics covered include standing waves, traveling waves, resonance, infinite lines, reflections, transmission line charts, open-circuited, and short-circuited stubs. Lectures and recitations.

Prerequisite: E.E. 312.

323. ELECTRONICS I. (4+3) 5 hours
This is a course in the theory of electron flow in vacuum tubes and solid state devices. Electron ballistics, the cathode-ray tube, charge behavior in materials, emission of electrons, diodes, power supplies, four terminal networks, the triode, the pentode, the transistor, and equivalent circuits are studied.

Prerequisite: E.E. 312.

411. COMMUNICATION CIRCUITS II. (3+3) 4 hours
A continuation of Communication Circuits I. The following topics are studied: measurements and impedance matching at radio frequencies, special consideration for power lines, and theory and design of
filters. Lectures, recitations, computing, and laboratory periods.

Prerequisite: E.E. 313.

412. Electric and Magnetic Waves. (5+0) 5 hours
General vector fields, Maxwell’s equations, wave guides, and radiating systems are treated. Lectures and recitations.

Prerequisite: E.E. 411.

421. Electronics II. (3+0) 3 hours
A continuation of Electronics I. The topics studied include small-signal amplifiers, feedback, direct-coupled amplifiers, and the audio-frequency amplifier with large signals.

Prerequisite: E.E. 323.

422. Electronics III. (3+3) 4 hours
A continuation of Electronics II. The topics studied include the radio frequency amplifier, oscillators, modulation, and demodulation.

Prerequisite: E.E. 421.

423. Electronics IV. (3+3) 4 hours
A continuation of Electronics III. The topics studied include qave-shaping circuits, gaseous conduction, power rectification, gaseous control tubes and circuits, and photoelectric devices.

Prerequisite: E.E. 422.

431. Electrical Machinery I. (3+3) 4 hours
This is a course in the theory, application, operating characteristics, and control of direct-current machinery. Lectures, recitations, computing, and laboratory periods.

Prerequisite: E.E. 213.

432. Electrical Machinery II. (3+3) 4 hours
A comprehensive study of the theory and performance of the alternator, the induction motor, and the transformer. Lectures, recitations, computing, and laboratory periods.

Prerequisite: E.E. 312.

433. Electrical Machinery III. (4+3) 5 hours
A continuation of Electrical Machinery II comprising a study of induction motors of special types, induction regulator and related control apparatus, the synchronous motor, and the synchronous converter.
all in theory, construction, and performance. Lecture, recitations, computing, and laboratory periods.

Prerequisite: E.E. 432.

441. Transient Circuits. (4+0) 4 hours
Prerequisite: E.E. 312 and E. 301.

442. Automatic Control I. (3+0) 3 hours
This is a course in closed-loop systems performance from equations and transfer-function plots. Lectures and recitations.
Prerequisite: E.E. 441.

443. Automatic Control II. (2+3) 3 hours
A continuation of Automatic Control I. Topics studied include: gain adjustment, series compensation, parallel compensation, and logarithmic method of analysis. Lectures, recitations, computing, and laboratory periods.
Prerequisite: E.E. 442.

450b Projects. 1–5 hours
Practical projects involving calculation, engineering judgment and skill in construction or repair work. These projects may vary from armature winding and motor repairing to the design and construction of laboratory apparatus. Individual assignments are used for each student.

462b and 463b Advanced Electrical Laboratory I & II. 3 hours
Senior year. Special laboratory problems and investigations are intricate and more advanced than those included in regular courses. Minor research projects may be undertaken. Hours to be arranged to suit balance of schedule.

b: Taught upon sufficient demand.

MECHANICAL ENGINEERING

202. Manufacturing Processes. (3+0) 3 hours
The manufacturing synthesis, equipment, methods, materials; foundry, welding, and fabricating processes; machine tools, gear cutting, abrasive processes, gaging and inspection. (Formerly M.E. 203).
Prerequisite: E. 211, E. 212, and E. 213 or concurrent therewith.
203. Metallurgy. (3+0) 3 hours
   Introduction to structure and properties of metals and alloys. Effects of diffusion, corrosion, heat treatment, et cetera. (Formerly M.E. 213).
   Prerequisite: Chemistry 113 or 123 and Physics 241.

301. Thermodynamics. (4+0) 4 hours
   For non-mechanicals. Fundamentals and basic applications of thermodynamics.
   Prerequisite: Chemistry 113, Mathematics 223, and Physics 243.

303. Heat Transfer. (3+0) 3 hours
   For non-mechanicals. Fundamentals and basic applications of heat transfer.
   Prerequisite: M.E. 301.

311. Thermodynamics. (5+0) 5 hours
   Fundamentals of thermodynamics applied to heat engines, turbines, refrigeration, et cetera.
   Prerequisite: Chemistry 113, Mathematics 223, and Physics 243.

312. Fluid Mechanics. (5+0) 5 hours
   Principles of incompressible and compressible fluid flow and flow measurement.
   Prerequisite: M.E. 311.

313. Heat Transfer. (5+0) 5 hours
   Introduction to heat transfer by conduction, convection, and radiation with numerical methods of computation.
   Prerequisite: M.E. 312.

322. Dynamics. (5+0) 5 hours
   Friction, rectilinear and rotary motion, kinetics of bodies under uniform and variable rectilinear and rotational acceleration, work; energy, momentum, impulse, and impact.
   Prerequisite: C.E. 301.

323. Kinematics of Machines. (3+3) 4 hours
   The study of mechanisms and their motion. Methods of determination of displacement, velocity, and acceleration of elementary machine components including gears, cams, etc.
   Prerequisite: M.E. 322.
331. Mechanical Laboratory I. (0+3) 1 hour
First course of a series of six. Measurements, instrumentation, calibrations, testing of materials and equipment, preparation of technical reports. Concurrent with M.E. 301 or 311.
Prerequisite: Physics 243.

332. Mechanical Laboratory II. (0+3) 1 hour
Continuation of M.E. 331. Fluid Mechanics Laboratory.

333. Mechanical Laboratory III. (0+3) 1 hour
Continuation of M.E. 332. Instrumentation and materials testing.

400. Projects. 1–5 hours
Practical studies or investigations involving the application of original thought, the determination of new information, or new applications of known information or equipment. (Formerly M.E. 450).

411. Design of Machine Elements I. (3+3) 4 hours
Calculation and analytical study of the design of functional machine elements such as shafts, bearings, fasteners, gears, clutches, couplings, etc., as well as the preparation and execution of drawings according to professional standards.
Prerequisite: M.E. 323 and C.E. 303.

412. Design of Machine Elements II. (3+3) 4 hours
A continuation of M.E. 411.
Prerequisite: M.E. 411.

413. Machine Design. (3+6) 5 hours
Complete design and layout of a machine or unit as used in a particular industrial branch of mechanical engineering including in the design the previously studied elements and mechanisms, in order to develop engineering judgment and professional proficiency from the original conception of an idea to the finished product.
Prerequisite: M.E. 412.

421. Internal Combustion Engines. (4+0) 4 hours
Fundamentals of spark—and compression—ignition engines and internal combustion processes.
Prerequisite: M.E. 313.

422. Mechanical Vibration. (3+0) 3 hours
Fundamentals of free, damped and forced vibration of single degree of freedom systems. Multidegree of freedom systems and introduction to vibration of elastic bodies and analogs.
Prerequisite: M.E. 322.
AUTOMOTIVE ENGINEERING. (3+0)  3 hours
Optional. A study of automotive vehicles including steering and suspension, transmission, final drive, etc. (Formerly M.E. 422).
Prerequisite: M.E. 412 and M.E. 422.

MECHANICAL LABORATORY IV. (0+3)  1 hour
Laboratory periods of 3 hours each applied to tests of blowers, compressors, pumps, engines (steam, gasoline, Diesel), steam turbines, heating and refrigeration units, steam power plants, and related equipment.

MECHANICAL LABORATORY V. (0+3)  1 hour
Continuation of M.E. 431.

MECHANICAL LABORATORY VI. (0+3)  1 hour
Continuation of M.E. 432.

FLUID DYNAMICS. (3+0)  3 hours
Emphasis on the forces involved in fluid motion and the use of total coordinates.
Prerequisite: M.E. 312.

TURBOMACHINES. (3+0)  3 hours
Application of similarity relations and dimensional analysis to turbomachines: fans, pumps, compressors, turbines and torque converters.
Prerequisite: M.E. 441.

REFRIGERATION. (3+0)  3 hours
Optional. Compression, absorption and other refrigerant systems. Cooling loads, multiple component and low temperature systems.
Prerequisite: M.E. 311.

HEATING & VENTILATING. (3+0)  3 hours
Optional. Heating loads, warm air, hot water and steam systems, radiant heating. (Formerly M.E. 443).
Prerequisite: M.E. 311.

HEAT POWER. (3+0)  3 hours
Optional. Power plants and allied equipment. (Formerly M.E. 441).
Prerequisite: M.E. 313.
473c  Tool Engineering. (2+3)  3 hours

Optional. An engineering study involving economic principles in the design, building and use of tools, dies, jig and fixtures, including measuring and gaging devices as used in mass production. Emphasis is also given to estimating and processing of simple and complex production parts, as well as the preparation of conventional shop drawings. (Formerly M.E. 341).

Prerequisite: M.E. 412.

c: Taught upon sufficient demand.
College of Pharmacy

ALBERT C. SMITH, Dean

AIMS AND OBJECTIVES

In addition to the general objectives set forth by the University, the College of Pharmacy proposes the following among its aims and purposes:

To prepare its students so that they will be able to meet satisfactorily the professional and cultural demands expected of pharmacists, and to carry their share of the responsibility of public health, welfare, and education in their respective communities.

Moreover, the students of the college are entreated to develop self-reliance, character, and ethics to the end that they will, with confidence and satisfaction, render safe and efficient pharmaceutical service to all who seek it.

Furthermore, they are made acquainted with the need for and value of membership in the local, state, and national pharmaceutical associations and in civic, social and religious bodies of the communities in which they live. As students, they are urged also to affiliate with the student branch of the American Pharmaceutical Association and other groups that promote worthwhile activities on the campus.

To accomplish these scholastic, professional, and social goals, students are advised concerning their plans of study and are encouraged to maintain high standards of scholarship. Participation in a reasonable number of campus activities, not deterrent to good academic record, is greatly encouraged. It is believed this gives breadth to the student's college experience and better prepares him for life after college.

REQUIREMENTS FOR ADMISSION TO PRE-PHARMACY

Students entering pre-pharmacy should have at least three years but preferably four years of English, two years of mathematics (algebra and plain geometry) but preference will be given to students with advanced credit. Two to three years of science (biology, general science and chemistry or physics or both) preference will be given to students with four years of science subjects.
REQUIREMENTS FOR ADMISSION TO THE
COLLEGE OF PHARMACY

1. The applicant must have at least forty-five (45) term hours or thirty (30) semester hours of credit with an accumulative point average of 2.0 (C average) to enter the College of Pharmacy.

2. ADVANCED STANDING. A student desiring to transfer from another college must present a transcript of his record and a certificate of honorable dismissal from the college he is leaving. He should submit a catalogue of his college. Full credit will be given for work satisfactorily completed in recognized institutions of higher learning, provided such work is parallel to the requirements for graduation in this institution, but credit will not be allowed for a course in which the lowest passing grade was received.

Advanced credit is given for not more than 135 quarter hours (ninety semester hours) exclusive of physical education.

Persons who meet the requirements for admission as indicated in the preceding paragraphs are issued a Permit to Enter the College of Pharmacy. To enter any of the regular courses of study the candidate, after being granted a Permit to Enter, must prepare a schedule of studies with the aid of an adviser and approval of the Dean, and pay tuition and fees as stated elsewhere in this catalog.

Students who are entitled to advanced standing may enter at the time approved by the Dean. Write for further information.

3. SCHOLARSHIP RATING AND PROBATION. To remain in good standing a student must maintain a 2.0 (C) average. If the accumulative point average of the student falls below 2.0, he is then placed on warning and allowed to carry a full schedule. If the student fails to bring his accumulative average up to 2.0, the student will be placed on probation. After one quarter on probation, the student who fails to improve his standing will be subject to dismissal.

A student must maintain an accumulative point of average of 2.1 in all major courses in the professional area. (Pharmaceutical Chemistry, Pharmacognosy, Pharmacology, Pharmacy and Pharmacy Administration.

To calculate the accumulative point average a three credit hour course with a grade of A gives twelve quality points. A five credit hour course with a grade of B, gives fifteen quality points, etc.
REQUIREMENTS FOR GRADUATION

Each person upon whom a degree is conferred must be of good moral character and have satisfactorily completed all the prescribed work. Under the five year plan a total of two hundred and twenty term hours plus six quarters of physical education are required for graduation. Note under scholarship rating the quality point requirements. A 2 quality point average is needed for graduation. The candidate must be present at the commencement exercises unless officially excused.

Each candidate for a degree must successfully pass an English Proficiency Test.

QUALIFICATIONS FOR EXAMINATION AND REGISTRATION AS A PHARMACIST

Every pupil shall:

A. Be a citizen of the United States, or shall have made application therefor;
B. Be not less than twenty-one years of age;
C. Be of good moral character and habits;
D. Be a graduate from a school or college of pharmacy or a department of pharmacy of a university recognized and approved by the State Board of Pharmacy and have completed at least the minimum course in pharmacy as outlined by the American Council on Pharmaceutical Education;
E. File proof to the Board, substantiated by proper affidavits of a minimum of one year's internship under the personal supervision of a registered pharmacist. Credit for internship may be granted only if obtained when the intern is not enrolled and in attendance in a college or university. Internship credit may not be given until the completion of one year in a college or university.

LIBRARY

The facilities of the main library are at the disposal of the pharmacy students. In this building will be found many of the current books and classics along with books, periodicals and journals in physics, biology and related sciences. All books pertaining to pharmacy, medicine and related sciences are in the main library as well as bound periodicals on
pharmacy and related sciences. Current issues of journals in pharmacy and related sciences are found in the pharmacy reading room.

**THE CURRICULUM**

Many courses are required to obtain satisfactory background in any field of endeavor and pharmacy is no exception. The curriculum thus is made flexible enough to allow preparation in specialized activities in the profession. All subjects are listed in a logical sequence so that the student will be better prepared for each ensuing course.

**PROPOSED FIVE YEAR PHARMACY PROGRAM**

On and after April 1, 1960 all students entering college and planning to receive the Bachelor of Science in Pharmacy degree will be required to follow a five year program.

The following proposed plan is suggested for this degree at Ohio Northern:

Total hours required for graduation are: Two hundred and twenty (220) term hours plus six (6) terms or quarters of physical education.

### FIRST YEAR

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### SECOND YEAR

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<td>Physical Education</td>
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<td>Chemistry 211</td>
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<tr>
<td>Philosophy Core C-31*</td>
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*or* Philosophy 201*        | 3        |          |

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<tr>
<th>WINTER</th>
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<tbody>
<tr>
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<tr>
<td>Philosophy Core C-32*</td>
<td>3</td>
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</tr>
</tbody>
</table>

*or* Logic 202*              | 3        |          |

|                          | 16       | 16       |
College of Pharmacy

SPRING
Philosophy Core C-33* or Ethics 203* 3
Physical Education 1
Chemistry 213 4
Physics 223 4

* If either of these programs, that is, Philosophy Core C-31, C-32 and C-33 or the sequence of Philosophy 201, Logic 202 and Ethics 203 are once started the student must continue in the same sequence for the full year to receive credit.

THIRD YEAR

FALL
Pharmacognosy 211 5
Pharmaceutical Chem. 321 4
Accounting 131 3
Elective 3 or 4 15

SPRING
Pharmacognosy 213 5
Pharmaceutical Chem. 323 4
Pharmacy 210 4
Speech 271 3

WINTER
Pharmacognosy 212 5
Pharmaceutical Chem. 322 4 16

Note: Pharmacy 220, Accounting 131, First Aid 112, and Speech 271 will be offered each term. Classes will be limited in number.

FOURTH YEAR

FALL
Pharmacy 301 4
Physiology 331 4
Bacteriology 321 4
Biochemistry 341 2
Pharmacy Admin. 310* 2 or 3 16 or 17
Elective

SPRING
Pharmacy 320 3
Physiology 333 4
Bacteriology 323 4
Biochemistry 343 2
Pharmacy Admin. 420* 3
Elective

WINTER
Pharmacy 302 4
Physiology 332 4
Bacteriology 322 4
Biochemistry 342 2 16

* Pharmacy Administration 310 must be taken during the fourth year. All Pharmacy Administration courses 310, 410, and 420 will be scheduled each quarter.

FIFTH YEAR

FALL
Pharmacy 401 4
Pharmacology 421 5
Pharmaceutical Chem. 431 4
Elective 3 16

SPRING
Pharmacy 403 4
Pharmacology 423 5
Pharmaceutical Chem. 433 4
Pharmacy 440 3

WINTER
Pharmacy 402 4
Pharmacology 422 5 16

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Electives: All elective courses prior to the third term of the fourth year in college must be elected either from the divisions of humanities, natural sciences, or social sciences in the liberal arts college and approved by the department involved and Dean of the College of Pharmacy.

Students planning to enter graduate school should elect a modern language (German, French, Russian); if a major in chemistry is desired, more mathematics should be elected.

Professional Electives may be selected from the following group:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Prerequisite</th>
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<tbody>
<tr>
<td>Advanced First Aid 113</td>
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<td>Pharmacology 431</td>
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<tr>
<td>Pharmacognosy 411</td>
<td>2</td>
<td>Pharmacy 411</td>
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<tr>
<td>Pharmacognosy 412</td>
<td>2 or 3</td>
<td>Pharmaceutical Chemistry 410</td>
</tr>
<tr>
<td>Pharmacognosy 413</td>
<td>2 or 3</td>
<td>Virology 423</td>
</tr>
<tr>
<td>Pharmacognosy 420</td>
<td>2</td>
<td>Parasitology 413</td>
</tr>
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</table>

All 450 courses are "Problem Courses" and are given in Bacteriology and five divisions of the Pharmacy College. These courses are open to seniors only and a total of 3 hours credit may be taken each term. All courses ending in "0" are generally taught each quarter, provided a sufficient number of students require the course.

**DESCRIPTION OF COURSES**

For detailed description of the basic pre-professional courses such as freshman English, biology, chemistry, mathematics, et cetera, see these Departments as listed elsewhere in this catalogue.

**BACTERIOLOGY**

123. INTRODUCTORY BACTERIOLOGY. 3 + 2

A course in the fundamentals of general and medical microbiology for students in the nursing program.  

**Dr. Lepovetsky**

321. GENERAL BACTERIOLOGY. 3 + 3

A general course in the fundamentals of microbiology with emphasis on bacteria. The history of the field is considered, the biology of microorganisms is discussed, the specialized fields in bacteriology are surveyed and the principal methods used to control micro-organisms are studied.  

**Dr. Lepovetsky**

322. PATHOGENIC BACTERIOLOGY. 3 + 3

The basic principles of immunity and pathogenicity are considered. Infections of man and domestic animals are discussed together with methods used to prevent and treat them.  

**Dr. Lepovetsky**

413. PARASITOLOGY

The principal helminthic infestations of man and domestic animals are discussed.

*Prerequisite:* Bacteriology 322.

Given in odd years only.  

**Dr. Lepovetsky**
423. Virology (el) 2 hours
Viral and rickettsial infections of man are studied.
Prerequisite: Bacteriology 322.
Given in even years only.
Dr. Lepovetsky

450. Bacteriology Problems (el) 1 to 3 hours
A minor investigation course designed to familiarize qualified juniors and seniors with research methods. The student will review the literature pertaining to his problem and perform laboratory experiments designed to solve the problems, and write a report summarizing his work.
Prerequisites: An adequate training in bacteriology and organic chemistry.
Dr. Lepovetsky

BIOLOGY

All students who are candidates for graduation from the College of Pharmacy are required to complete at least one year of biology or its equivalent.
A description of these courses is listed elsewhere in this catalog.

CHEMISTRY

All students who are candidates for graduation from the College of Pharmacy will be required to complete Chemistry 111, 112, 123, 211, 212 and 213 or the equivalents. Additional courses in chemistry may be elected upon approval of the Dean.
A description of the courses taught in the chemistry department is listed elsewhere in this catalog.

ENGLISH

The pharmacist must use both oral and written English. In order to communicate clearly and adequately with the wholesaler, manufacturer, medical practitioner, layman, state boards, the government, and to prepare papers for clubs, articles for magazines and local newspapers, or advertising, the ability to speak and write English is essential.

English C-1, C-2, and C-3 or their equivalent are required of all pharmacy students. Public Speaking, English Grammar and Business Communications may be elected. A description of these courses will be found elsewhere in this catalog.
HEALTH AND PHYSICAL EDUCATION

Some form of physical activity is required of all students during the first two years of residence in the University. The nature of the work will depend upon the needs of the individual as revealed by a careful examination.

The pharmacist should learn the fundamentals of personal and general hygiene that he may be able to maintain a high degree of efficiency during and after college life and to assist in the promotion of public health as outlined by the United States Public Health Service. Courses 110, 121, and 212 in Health and Physical Education may be used as electives on approval of the Dean. A complete description of these courses will be found under courses of Health in another part of this catalog.

MATHEMATICS

Mathematics is of the utmost importance to a pharmacist; inaccuracies in computations have led to serious results. All pharmacy students are required to take Mathematics 111, 112, and 113 or their equivalents and a specially designed course in Pharmacy Arithmetic described as Pharmacy 220.

Students desiring to pursue a major in chemistry should take additional courses in mathematics, subject to approval by the Dean. A description of the required courses and other suitable electives in this field will be found elsewhere in this catalog.

MODERN FOREIGN LANGUAGES

Many texts and periodicals on pharmacy and the allied sciences are published in a foreign language. In order to meet the demand of students who desire a knowledge of a foreign language for reading, conversational, or business purposes, appropriate courses are offered. If a student expects to do graduate work, he should have a reading knowledge of at least two foreign languages, French and German.

PHARMACEUTICAL CHEMISTRY

321. PHARMACEUTICAL ANALYSIS. 3 + 3 4 hours

A course involving the theories and methods utilized in gravimetric assay procedures of inorganic chemicals of the U.S.P. and N.F., and some of the more common procedures using organic precipitants. The latter part of the quarter introduces volumetric theories.

Prerequisites: Chemistry 111, 112, 123. DR. YODER

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322. **Pharmaceutical Analysis. 3 + 3** 4 hours
   A continuation of the theories and methods involved in volumetric procedures. The latter part of the quarter is devoted to physical methods employed in determining the purity of substances by refractometric, alcoholumetric, colorimetric and polarimetric means. Laboratory exercises are used to emphasize these determinations.
   **Prerequisites:** Chemistry 111, 112, 123.
   Dr. Yoder

323. **Pharmaceutical Analysis. 3 + 3** 4 hours
   A continuation of both physical and chemical constants carried out on organic material of the U.S.P. and N.F. A study of the proximate assays of official drugs and preparations being emphasized. Laboratory procedures to correlate the above discussions are made.
   **Prerequisites:** Chemistry 211, 212, and Pharmaceutical Chemistry 321 and 322.
   Dr. Yoder

431. **Inorganic Chemicals. 4 + 0** 4 hours
   A study of the preparation, reactions, solubility, test for purity and identity of the inorganic chemicals of the U.S.P. and N.F. A brief discussion of the more important non-official chemicals is made, incompatibilities, action and uses given.
   **Prerequisites:** Chemistry 113, Pharmaceutical Chemistry 321 and 322.
   Dr. Smith

432. **Inorganic and Organic Chemicals. 4 + 0** 4 hours
   The inorganic chemical study is completed, then the study of the U.S.P. and N.F. alkaloids and alkaloidal salts is made. Trade names are listed for any preparation or substance found in this group.
   **Prerequisites:** Chemistry 113, 213, and Pharmaceutical Chemistry 322.
   Dr. Smith

433. **Organic Chemicals. 4 + 0** 4 hours
   A study of the non-alkaloidal organic chemicals, vitamins, hormones, antibiotics, fixed and volatile oils is made as to synthesis, preparations, reactions, solubility, identity, action and dose. Trade names are listed and studied.
   Dr. Smith

450. **Chemistry Problems** (el) 1 to 3 hours
   The title and character of the course is dependent upon the problem. This course is designed to stimulate introductory research work. Open to seniors only.
   Dr. Smith

410. **Chromatographic Analysis** (el) 2 hours
   A study of the various types of Chromatographic Analysis.
   Dr. Lepovetsky or Dr. Yoder
PHARMACOGNOSY

211. General Pharmacognosy 1. 3 + 3  
4 hours
The content of the course is based upon biochemical classification. It includes the study of nomenclature, descriptions, sources, production, preservation, constituents, and therapeutic properties of the official and of some important non-official vegetable and animal drugs and their derivatives. The course includes a study of the basic plant cells and tissues and non-protoplasmic cell inclusions. In the laboratory microscopical studies are supplemented with histological examinations and microscopical examinations of important powdered drugs as well as with chemical tests.

Prerequisites: Biology 111, 112, 123 and Chemistry 111, 112, and 123.

Dr. Koffler
Mr. Weinstein

212. General Pharmacognosy 2. 3 + 3  
4 hours
A continuation of General Pharmacognosy 211.

Dr. Koffler
Mr. Weinstein

213. General Pharmacognosy 3. 3 + 3  
4 hours
A continuation of General Pharmacognosy 211 and 212. In addition, the fundamentals of antibiotics, herbicides, insecticides and rodenticides are studied.

Dr. Koffler
Mr. Weinstein

411. Review of Current Pharmacognosy Literature. 2 + 0  
(el) 2 hours
A review of recent literature, books, and articles in the field of Pharmacognosy.

Dr. Koffler

412. Drug Plants of Economic Importance. 2 + 0 or 2 + 3  
(el) 2 or 3 hours
Commercial sources of crude drugs and vegetable products especially gums, waxes, vegetable dyes, spices and cereals. The problems of storage, infestation, etc. are studied. Two lectures a week. Laboratory work may be elected giving an additional credit.

Dr. Koffler

413. Allergenic Plants, Allergy and Allergens. 2 + 0 or 2 + 3  
(el) 2 or 3 hours
A study of pollens, pollen-bearing plants, food allergies and allergenic molds. Field identification, pollen and mold spore counts as well as types of allergies studied.

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420. Insecticides, Fungicides and Herbicides. 2+0  (el) 2 hours
A study of the composition, uses and standards of important synthetic and natural products used as insecticides, fungicides and weed-killers.

450. Pharmacognosy Problems  (el) 1 to 3 hours
A special problems course. Small research projects in Pharmacognosy are carried out. Students may also work on problems of cultivation of medicinal plants Dr. Koffler

PHARMACOLOGY

133. Pharmacology. 3+0  3 hours
An elementary general course in Pharmacology for students in the nursing program.

421. Pharmacology 1. 4+3  5 hours
Introduction, vocabulary, and terminology used in pharmacology are discussed. The cathartics, cholagogues, choleretics, antacids, digestants, anthelmintics, local anti-infectives, sulfonamides and related compounds, antibiotics, and biological preparations are considered. Experiments shall be related to the lectures of this quarter.

Prerequisite: Physiology 331 and 332, Chemistry 211, 212, and 213, and Bacteriology 322. Dr. Ferguson

422. Pharmacology 2. 4+3  5 hours
A study of local anesthetics, drugs acting on the central nervous system, drugs acting on the autonomic nervous system, and drugs acting on striated muscle. Experiments shall be related to the lectures of this quarter.

Prerequisite: Pharmacology 421. Dr. Ferguson

423. Pharmacology 3. 4+3  5 hours
A study of histamine and anti-histaminics, drugs acting on blood and hematopoietic system, hormones and drugs acting on the endocrine glands, cardiovascular drugs, diuretics, vitamins, diagnostic aids and amebicides. Experiments shall be related to the lectures of this quarter.

Prerequisite: Pharmacology 422. Dr. Ferguson

430. Pharmacology (Toxicology). 2+0  (el) 2 hours
The general Principles of Toxicology. The toxic effects, symptoms and antidotal treatment of the currently used Therapeutic agents.
College of Pharmacy

450. Pharmacology (el) 1 to 3 hours
A special problems course to stimulate interest in research in this field. Open to Seniors only.
Prerequisite: Pharmacology 402.
Dr. Ferguson

PHARMACY

Pharmacy Orientation 1 and 2 1 hour per term
This course is designed to assist new students in orientating themselves into college courses, to understand the value and use of the library. It also will acquaint the student with the pharmacy curriculum so that he becomes more interested in the profession as well as explains the value of choosing the proper electives so that he will be better prepared for the area of the profession he plans to follow.

The course will also help to acquaint the students with the various national associations and try to develop an interest as well as the value of becoming an active member in state and local associations.

The student will also be instructed as to the value of continuing his education for advanced degrees and the value of continuing his education by attendance at refresher courses.

An introduction as to the legal and professional responsibilities will be discussed.

210. Introduction to Pharmacy. 3+3 4 hours
This is a beginning professional course which is designed to acquaint the student with the theories, techniques, and terminology essential to an understanding of the science and art of Pharmacy.
Dr. Lee

220. Pharmacy Arithmetic. 3+0 3 hours
A course in calculations pertaining to pharmacy. The student is taught current weights and measures, applications of proportions, alligation, specific gravity, specific volume, thermometer scales, percentage solution, commercial discounts and elementary chemical problems common to pharmacy.
Staff

301. Pharmaceutical Preparations 1. 3+3 4 hours
The course includes the study of aqueous, hydro-alcoholic, alcoholic, and suspension products of the U. S. Pharmacopoeia and National Formulary.
Dr. Lee

302. Pharmaceutical Preparations 2. 3+3 4 hours
A continuation of Pharmacy 301 and includes the making of a variety of solid and semi-solid preparations including ointments, powders and suppositories.
Dr. Lee

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320. **History of Pharmacy.** 3 + 0  
A survey of the ancient, medieval and modern practices and ideals of the profession of Pharmacy. This course is mainly cultural, and is composed of lectures, discussions and library assignments. **Dr. Lee**

401. **Prescription Practice.** 3 + 3  
The Prescription; technology of powers (tablets, capsules, pills, etc.); percentage solutions. **Dr. Araujo**

402. **Prescription Practice.** 3 + 3  
Isotonic and buffered solutions; ophthalmic solutions; ointment, emulsion and suspension technology; chemical, physical, and therapeutic incompatibilities. **Dr. Araujo**

403. **Prescription Practice.** 3 + 3  
Prescription specialties and commercial products. General principles of hospital and industrial pharmacy. **Dr. Araujo**

411. **Animal Pharmacy.** 2 + 0  
A study of the medicinal substances used in Veterinary Medicine and the relationship of the Pharmacist to the Veterinarian. **Dr. Ferguson**

440. **Advanced Survey.** 3 + 0  
A technical survey of the latest U.S.P. and N.F. prerequisites. The correlation and use of general chemistry, qualitative and quantitative analysis, organic chemistry, pharmacognosy, pharmacology and pharmacy as used in the U.S.P. and N.F.  
**Prerequisites:** Senior standing. **Dr. Smith and Staff**

450. **Pharmacy Problems**  
Minor investigations for qualified students. A course designed to interest students in research in Pharmacy. Open to seniors only. **Dr. Lee and Dr. Araujo**

**PHARMACY ADMINISTRATION**

131. **Principles of Accounting.** 3 + 0  
See Department of Economics, College of Liberal Arts for description. **Mrs. Ritz**

310. **Pharmacy Laws.** 3 + 0  
A study of the federal, state and local acts, and regulations governing the practice of Pharmacy and the sale of potent and habit forming substances. **Dr. Lee and Dr. Araujo**
drugs. Government bulletins and pamphlets are issued to students so that they will become acquainted with said laws.  

**Mr. Benton**

### 410. Business Management. 3 + 0

A course in drug store business methods. Attention is given to arrangement of fixtures and stock, sources of supplies, distribution to the physician, dentist, veterinarian, the public hospitals, and to other phases of business essential to successful drug store management.  

**Mr. Benton**

### 420. Drug Marketing. 3 + 0

A study of the marketing of drugs and drug products. Emphasis is from the manufacturer’s and wholesaler’s standpoint rather than from the retailer’s point of view. The laws governing commercial manufacture, distribution, and the various fair practices acts, as they pertain to pharmacy, are discussed.  

**Mr. Benton**

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**PHYSICS**

It is impossible to comprehend many of the changes which occur in the manufacture of pharmaceutical preparations without having a knowledge of the science of physics. All pharmacy students under the five-year plan will be required to take Physics 221, 222 and 223 or their equivalents. For a complete description of these courses see the descriptions under “Physics” in another section of this catalog.

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**PHYSIOLOGY**

All students are required to complete at least two terms of Physiology. A description of these courses is listed under Biology elsewhere in this catalog.
College of Law

EUGENE N. HANSON, Dean

AFFILIATIONS

The College of Law is fully approved by the American Bar Association.

The College also holds membership in the League of Ohio Law Schools, and is fully approved by the League.

PURPOSE

The courses in the College of Law are planned primarily to prepare students for the practice of law. However, such courses may also be pursued advantageously by anyone desiring to acquire a knowledge of the principles and history of law, either as a part of a liberal education, or as part of a foundation for a career in government or in business.

Courses are offered in all subjects included in the Ohio Bar Examination, and various electives may be pursued in the course of study.

Tuition rates are reasonable and by reason of the location of the school in a small community, the living costs are comparatively low.

Among the advantages offered by Ohio Northern's Law College are small classes, opportunity for frequent class participation, individual contact with instructors both in and out of the classroom, and a small community environment conducive to good study habits.

In training students for the practice of law, the College of Law has four chief objectives:

1. To inculcate the principles of legal ethics and of the lawyer's public responsibility, so that the student, as a lawyer, may be worthy to take his place as a trusted leader and counselor in his community.

2. To inculcate a systematic and complete grounding in the history and fundamental principles of the common law and statute law including the more important statutes and decided cases of Ohio.

3. To develop proficiency in the application of the principles of law to the complicated relations, rights and duties arising in modern society through the training of the powers of analysis, discernment and judgment.

4. To show the place, importance, and aims of the law in society.
SCHOLARSHIPS AND STUDENT AID

Scholarships, grants-in-aid, loans and some prizes for worthy students are available to all law students. For a more detailed statement, refer to page 21 of this catalogue.

BEGINNING LAW STUDENTS

Students who are commencing the study of law are admitted only at the beginning of the fall quarter.

ORIENTATION WEEK

All beginning law students attend a series of lectures during Orientation Week, which is the week preceding the first day of classes in the fall quarter. These lectures are designed to orient the student to the study of law before he is actually faced with the study of law. He will learn something of the nature of the profession into which he proposes to enter, and the nature of the studies through which he must go to accomplish this. There will be a study of the process of trying a case and appealing it, so that the student will be able to understand the functions of the trial court and the appellate opinion in the judicial process. The lectures commence at nine o'clock on Wednesday morning of Orientation Week. Details may be obtained from the dean's office.

LAW SCHOOL ORGANIZATIONS

All students, upon admission to the College of Law, become members of the Junior Bar Association, an organization which undertakes student activities of general interest and importance to the College of Law and its program. Yearly dues are five dollars. The organization has full membership in the American Law Student Association, affiliated with the American Bar Association.

Delta Theta Phi and Sigma Delta Kappa, national law school fraternities, are represented by chapters in the College of Law.

NATIONAL MOOT COURT COMPETITION

The College of Law is eligible to enter a team each year in the National Moot Court Competition, and encourages such competition.
SCHOOLS REPRESENTED

Ever increasing numbers of our law students have secured their pre-legal education at colleges and universities other than Ohio Northern University. Many of these are coming with the Bachelor's degree or its equivalent. Among the colleges and universities contributing to the pre-legal education of our students in the past are the following: Amherst, Ashland College, Baldwin-Wallace, Bowling Green, Brown, Colgate, Defiance, Denison University, Depauw, Duquesne University, De Sales College, Fenn College, Geneva, Harvard, Heidelberg, Hillsdale, Hiram, John Carroll University, Kenyon, Kent State, Marshall College, Miami, Missouri, Mt. Union, Muskingum College, Northwestern, Ohio University, Ohio State University, Ohio Wesleyan University, Pittsburgh, Purdue, Rio Grande, Swarthmore, Toledo University, University of Cincinnati, University of Dayton, University of Kentucky, University of Michigan, Michigan State University, University of Southern California, University of Virginia, University of West Virginia, University of Wisconsin, Vincennes University, Virginia Military Institute, George Washington University, Washington and Lee University, Western Reserve University, Western State Teachers College, Wilmington College, Wittenberg College, Wooster, Youngstown College, and Yale University.

THE JAY P. TAGGART MEMORIAL LAW LIBRARY

The Law Library draws much of its support from a permanent endowment established in memory of the late Jay P. Taggart, one-time Dean of the College and long-time trustee of Ohio Northern.

The Law Library is up-to-date, modern, and well selected. It contains the reports of the courts of last resort of the States, the United States Supreme Court reports, the Federal reports, the Reporter System, a complete set of English reports, the more important series of special reports and selected cases, a collection of the latest editions of standard text books, leading legal periodicals, digests, the leading encyclopedias of law, and other works of reference. The Library is accessible each week day, the students being allowed free access to the books.

The material included in the Library complies with law library requirements of the American Bar Association.
METHODS OF INSTRUCTION

Instruction is based upon the case-book method. To the cases found in the case-book are added selected cases from Ohio and other jurisdictions. The lecture hour includes a thorough questioning of the students upon the cases studied and informal discussions by instructors and students upon the underlying and distinguishing principles illustrated by the cases.

ADMISSION

For admission procedure, see pages 13-15.
Candidates of good moral character may be admitted upon satisfying the following requirements:

(1) Graduation from a first-grade high school and

(2) An undergraduate bachelor's degree from an approved college.

(3) The submission of the applicant's score on the Law School Admission Test which is given periodically by the Educational Testing Service of Princeton, New Jersey.

In no case may a deficiency in pre-law study be made up concurrently with the work in the College of Law.

A student desiring to enroll in the College of Law applies to the Admissions Counsellor or to the Dean of the College of Law for an application blank.

ADVANCED STANDING. Upon approval of the Dean of the College of Law, advanced credit is given for not more than two years of satisfactory law study in residence at any law school approved by the American Bar Association.

SPECIAL STUDENT. Persons who have sufficient education and experience to study law with profit may enter the College of Law as special students with the approval of the Dean, even though they cannot meet the entrance requirements. Anyone desiring to enter as a special student or to secure fuller information in regard to preliminary education should write to the University Admissions Counsellor or the Dean of the College of Law. Such special students may not be eligible for the bar examination in Ohio and many other states.

REGISTRATION FOR THE OHIO BAR

Residents of the State of Ohio are required to register with the Supreme Court of Ohio at the time they commence the study of law. Others who intend to acquire residence in the state and to take the
Ohio Bar examination should also register with the Supreme Court. The fee for this registration is $10.00 payable to the Clerk of the Supreme Court. Forms for this registration can be obtained in the office of the College of Law at the beginning of the fall quarter. The Supreme Court fee for taking the Ohio Bar examination is $30.00, which is payable shortly before the examination.

PRE-LAW COURSES

The College of Liberal Arts offers favorable opportunities to the student in preparing for the study of law.

The pre-law course offered not only meets the requirements set by the Supreme Court of the State of Ohio as to the preliminary education that every student must have before beginning the study of law, but is especially planned to help the student to prepare properly for such an undertaking.

For further information about these courses, the student is referred to the Liberal Arts section of this catalog.

GRADUATION

The degree of Bachelor of Laws is conferred on students who have completed satisfactorily a total of 119 quarter hours including all the prescribed courses, and in addition certain required courses for which no credit hours are given, or who have received credit therefor in accordance with the section entitled Advanced Standing and who have studied in residence at this college for at least three quarters immediately preceding graduation, and who have at least a two quality point average for every credit hour or an accumulative average of 66 beginning with the graduating class of 1961.

Beginning with the entering class of 1958 an average of 66 for each year of work is required to remain in attendance and an accumulative average of 66 is required for graduation. An exception will be made in the case of a senior who fails to make an average of 66 in his senior year's work. He will not be dismissed, but he will be permitted to take further work in order to bring his average for his senior work, plus the additional work, up to 66. This must be done within a reasonable time.

GENERAL REGULATIONS

1. A full-time student is any student who carries twelve hours or more per quarter.
2. Students may select from the courses offered such subjects as they desire, with the approval of the Dean, not to exceed a maximum of 16 credit hours per quarter except in unusual cases.

3. In the section of the general catalog dealing with Administration are found rules and regulations pertaining to chapel and class attendance, registration, and preregistration, government, withdrawing courses, warning and probation, eligibility for extra-curricular activities, examinations, grade marks and quality points.

4. Expenses, tuition, fees, living costs, and housing are likewise described in an earlier section of this catalog.

5. The Board of Trustees and Faculty of the University reserve the right to make such changes as they deem necessary without published notice.

CLASSIFICATION

The minimum requirements for second year standing are thirty-eight credit hours and an average of 66; for third year standing, eighty credit hours and an average of 66.

SUMMER QUARTER

The College of Law offers no courses during the Summer quarter.

COLLEGE OF LAW CURRICULUM

The work of the first year is all required. Second and third year courses are all required except those separately designated as electives, which are open to both second and third year students subject to the provision that a student may not elect to exceed sixteen hours in any quarter in which elective courses are open to him, unless approved by the Dean. The right is reserved to make such changes in the curriculum and the order in which courses may be given as may be necessary.

FIRST YEAR

<table>
<thead>
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<td>Real Property I</td>
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<td>Torts II</td>
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<td>Legal Bibliography</td>
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<td>Torts I</td>
<td>3</td>
<td>Criminal Law</td>
<td>5</td>
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<td>WINTER QUARTER</td>
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*Courses are required for graduation but no credit hours are given toward the 119 hours required for graduation.
DESCRIPTION OF COURSES

FIRST YEAR

ALL COURSES REQUIRED

BUSINESS ASSOCIATIONS 5 hours

The nature, formation and purpose of agency and partnership relations; the duties and liabilities arising from the relationships; the marshalling of assets in equity and the priorities between individual and firm creditors; consideration of Workman's Compensation legislation and other phases of the subject of master and servant. Latty, *Introduction to Business Associations*.

CONTRACTS I 4 hours

CONTRACTS II 5 hours

Fundamental courses dealing with the nature of a contract; the capacity of the parties, offer and acceptance; consideration; the performance of contracts, including conditions and impossibility of performance; the discharge of contracts; rights of beneficiaries, joint and several contracts; assignment of contracts; illegal contracts and the statute of frauds. Shepherd and Wellington, *Contracts and Contract Remedies* (4th Edition).

CRIMINAL LAW 5 hours

This course treats of the theories of crime and punishment; the criminal act and mental element in crime; specific offenses at common law and as developed by statutes; appropriate defenses in relation to the specific crimes; parties. Perkins, *Cases On Criminal Law and Procedure*.

LEGAL HISTORY 3 hours

The course will cover essential points of the history of the development of common law and equity, including the origin of the system of writs, the post-conquest history of the judicial system, the position of the chancellor, the contributions of commentators and the growth of law in England with respect to the general context of the growth of the executive, administrative and legislative system. The forms of action at common law will receive particular attention and cases illustrating the various forms of action at common law will be studied. McBaine, *Introduction to Civil Procedure*.

LEGAL BIBLIOGRAPHY 1 hour

This course is required but no credit is given for it toward gradu-
ation. The purpose is to give the student training in the use of law books and in finding the law. The course must be completed to the satisfaction of the Instructor. Pollack, *Fundamentals of Legal Research*.

**PERSONAL PROPERTY**

4 hours


**REAL PROPERTY I**

5 hours

This course deals with air and water rights, support, easements, covenants running with the land, rents, profits, waste, and public rights. Casebooks same as in Personal Property.

**REAL PROPERTY II**

5 hours

This course treats of the historical origin of land law, tenure, seisin, the differentiations of estates in land, titles and their transfer by act of the parties and operation of law. Casebook same as in Real Property I.

**TORTS I**

3 hours

**TORTS II**

5 hours

This course includes a consideration of the bases and extent of legal liability for invasions of various interests of personality and property with especial attention given to wrongs, such as assault, battery, false imprisonment, trespass upon realty and personality, conversion, defamation, malicious prosecution, injuries resulting from negligence, injuries intentionally inflicted and liability without fault. An analysis is made of the various concepts of importance in this field of law, such as intention, malice, legal right and wrong, negligence and proximate causation. Smith and Prosser, *Cases and Materials on Torts* (2nd Edition).
SECON DON YEAR

Required Courses

Civil Procedure Courses
The courses in adjective law are designed to convey information, to
develop critical thinking, and to turn out lawyers reasonably compe-
tent in the skills of trial practice. To secure these ends, the field of
procedure is treated as a unit. For convenience in presentation, how-
ever, the subject matter is grouped into areas of study so that related
material will be taught together. The courses are, therefore, divided
as follows and are presented in consecutive quarters in the second year:

Procedure I — Jurisdiction and Judgments 4 hours
A series of related problems form the basis for this course: jurisdic-
tion of state courts over the subject matter, the special problems of
federal court jurisdiction, territorial extent of jurisdiction and venue,
the steps to be taken to invoke the jurisdiction of the court, collater-
ally attacking a judgment for want of jurisdiction, the effect of judg-
ments on the same or different causes of action, and the control exer-
cised by the court over its judgments. Blume and Joiner, Jurisdiction
and Judgments.

Procedure II — Pleading and Joinder 4 hours
The course is divided into four parts. Part One deals with the rules
of pleading currently in force under statutes and court rules. Part Two
deals with four systems of joinder of claims and parties: common law,
equity, code, and federal. Part Three relates to pre-trial objections to
pleadings and joinder. Part Four contains text and cases on the forms
of action. Blume and Reed, Pleading and Joinder.

Procedure III — Trials and Appeals 4 hours
This course considers the relationship between the judge and jury,
and the problems arising therefrom — selection of the jury, direction
of the verdict, instructions, and the setting aside of the verdict. It also
treats the problem of review — the parties, the foundation for review,
the methods of review, and the steps in the review process. In addition,
a serious attempt to teach the student how to try a lawsuit is made.
Joiner, Trials and Appeals.

Constitutional Law I 3 hours

Constitutional Law II 3 hours
Courses include the interpretation of the constitutional limitations
for the protection of life, liberty and property, police power, taxation,

**Equity**

5 hours

This course involves the consideration of the rise of the court of equity, the powers of the court, the principles governing the exercise of equitable jurisdiction, and the equitable remedies of injunction, bills of peace, bills of interpleader, bills to remove cloud from title, declaratory judgments, and specific performance. Cook, *Cases on Equity* (4th Edition).

**Evidence**

5 hours

An examination of contemporary rules of evidence relating to burden of proof and presumption, judicial notice, the examination of witnesses, competency and privilege, and illegally obtained evidence, followed by a careful development of the opinion rule, the hearsay rule and its exceptions, and the best evidence rule. McCormick, *Cases on Evidence* (2nd Edition).

**Legal Problems**

3 hours

Training will be had in legal research, in writing office memoranda, trial briefs and appellate court briefs, and in making oral arguments on the appellate level. This course is required but gives no credit toward graduation.

**Private Corporations**

5 hours

This course treats of the characteristics of private corporations, including their formation, powers, rights, and liabilities, the rights and liability of stockholders, and of officers and directors, and the rights of creditors against the corporation and its officers. Lattin and Jennings, *Cases and Materials on Corporations* (3rd Edition).

**Restitution**

3 hours

This course deals with a study of the remedies of quasi-contract, equitable accounting, constructive trust, equitable lien, rescission and reformation, and the legal and equitable remedies available in cases of misrepresentation, fraud, partially performed agreements, mistake, illegality, defective capacity and duress. Durfee and Dawson, *Cases on Restitution*. 

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THIRD YEAR

Required Courses

CONFLICT OF LAWS  5 hours
This course treats of the principles of private international law, jurisdiction of courts; the choice of law governing torts, contracts, divorce, transfers of property by deed, will and intestate succession; marriage, adoption, domicile, foreign judgments and such procedural matters as statutes of frauds and of limitations. Stumberg, Cases on Conflicts.

DOMESTIC RELATIONS  4 hours
A course dealing with the legal aspects involved in the organization and disorganization of the family with particular emphasis upon marriage, separation, divorce, annulment, and the rights and duties of spouses and infants. Compton, Cases on Domestic Relations.

FEDERAL TAXATION I  3 hours

FEDERAL TAXATION II  4 hours
This course deals with the major sources of federal revenue with particular emphasis on income and estate taxes. Bittker, Federal Income, Estate and Gift Taxation.

LEGAL ETHICS  1 hour
This course treats of the rules of conduct governing the lawyer in the practice of his profession. This course must be completed to the satisfaction of the Instructor, although no credit toward graduation is given. Pirsig, Cases on the Legal Profession.

NEGOTIABLE INSTRUMENTS  5 hours
This course involves the consideration of the general principles governing bills of exchange, promissory notes and checks, and the uniform negotiable instruments law. Britton, Cases on Bills and Notes (4th Edition).

PRACTICE COURT I  1 hour

PRACTICE COURT II  1 hour
The first quarter consists of participation by the class in problems dealing with various phases of the trial, such as examining a witness, giving a closing argument to the jury, etc. Each class session takes up a different portion of the trial process, which is illustrated and discussed by members of the class and the Instructor.

The second quarter consists of preparing and trying a case from the interviewing of the witnesses, who have witnessed a film portraying the
incident on which the trial is based, to the verdict of the jury. These
courses are required but give no credit toward graduation. Keeton,
*Trial Tactics and Methods*.

**Trusts**
This course treats of the origin and development in courts of equity

**Wills and Administration of Estates**
This course treats of the nature of testamentary disposition and in-
testacy, and administration of estates. Mechem and Atkinson, *Cases

**ELECTIVE COURSES**
Because of the number of courses required to be taken, the student
does not have the opportunity to take all of the electives. He is given
elective courses from those listed and may or may not have the oppor-
tunity to take a specified course.

**Administrative Law**
This course deals with the powers and procedure of administrative
agencies in this country. It includes a consideration of the nature of
the power vested in administrative bodies, distinction between legisla-
tive, judicial and executive powers, conclusiveness of administrative
determinations, the requirement of due process, and the extent of
judicial control over administrative action. Casebook to be announced.

**Creditors' Rights**
This course includes a study of fraudulent conveyances, creditors'
agreements, receiverships and the administration of bankrupt estates.
Hanna and McLaughlin, *Cases on Creditors’ Rights* (Consolidated

**Damages**
In this course the rules governing the measure of damages in actions
founded on contract and tort are considered. Crane, *Cases on Damages*.

**Legal Drafting**
Designed to give the student practice in the drafting of the more
common legal instruments. Cook, *Legal Drafting*.

**Future Interests**
A study of future interests, vested and contingent, in real property.

**Insurance**
This course includes the nature and requisites of the contract, par-
ties, insurable interest, premiums, representations and warranties, agents and their powers, waiver and estoppel, rights under the policy, a study of the standard fire policies, life insurance, marine and accident. Gable, *Cases on Insurance* (2nd Edition).

**Labor Law**

This course includes a study of the right to organize the union; the process of collective bargaining; the legality of strikes, lockouts and boycotts; the interest of the public in labor disputes; legislative intervention, with emphasis on the National Labor Relations Act, including the Taft-Hartley Law, and the Labor Management Disclosure Act of 1959. Cox, *Cases on Labor Law* (4th Edition).

**Real Estate Transactions**

This course deals with the legal concepts and institutions of the marketing of land. It cuts across other fields such as equity, conveying, vendor and purchaser, landlord and tenant, and mortgages, in covering material revolving about a central theme—the marketing of land use. Dunham, *Modern Real Estate Transactions* (2nd Edition).

**Sales**

A study of the legal incidents connected with the sale of goods viewed in the contemporary commercial context, with analysis of various concepts such as passage of property, estoppel and fraud, warranties, remedies of buyer and seller, and sales financing. The following uniform laws and cases construing these statutes are studied in detail: Uniform Sales Act; Uniform Conditional Sales Act; Uniform Warehouse Receipts Act; Uniform Bills of Lading Act; Uniform Trust Receipts Act; Uniform Commercial Code. Bogert and Britton, *Cases on Sales* (3rd Edition).

**Municipal Corporations**

This course treats of the formation of and legislative control over public corporations (primarily cities and villages), the powers of such corporations with respect to public welfare, appropriations, indebtedness, contracts and special assessments, and the liability of such corporations in tort and contract. Stason and Kauper, *Cases and Materials on the Law of Municipal Corporations* (3rd Edition).

**Suretyship**

This course includes the creation of the relationship, the contract, the statute of frauds, the rights and remedies, the defenses, guaranty contracts, and letters of credit, private and corporate sureties, and incidentally a consideration of the different kinds of bonds. Simpson, *Cases on Suretyship*. 188
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