Divisions and Departments

FINE ARTS: Art; Music; Speech and Theatre.
HUMANITIES: English; Foreign Languages; Philosophy and Religion.
MATHEMATICAL AND NATURAL SCIENCES: Biology; Chemistry; Mathematics and Computer Science; Physics.
TEACHER EDUCATION: Education, Health and Physical Education; Industrial Technology.

Principles and Objectives

The Getty College of Arts and Sciences is a community with resources and opportunities for learning. Its students come from all colleges of the University, representing individual differences and diverse goals and experiences. The faculty encourages and assists students to use fully their abilities while they are learning, developing personal goals, and discovering means to achieve their goals.

Students learn to understand themselves and their environment by exploring a variety of academic disciplines. These general educational experiences help them perceive relationships among many kinds of knowledge. Students also achieve proficiency in one or more areas of study where they learn skills and cultivate insights enabling them to make beneficial contributions to society through personal relationships, community service, and career employment. Students are prepared for a lifetime of learning in a changing world by learning to reason logically, to communicate effectively, and to apply knowledge thoroughly. The College of Arts and Sciences instills in the student an appreciation for human values and a personal commitment to ethical and religious ideals which are vital throughout life.

Admission Standards

Candidates seeking admission to the College of Arts and Sciences are required to meet the general requirements for admission to the University. The College of Arts and Sciences accepts high school graduates and non-graduates who have 16 acceptable units and who are recommended by their high school counsellor. Twelve of these units are as follows: 4 units in English; 2 units in mathematics (including algebra and plane geometry);
6 units in history, social studies, languages or natural sciences, or any combination thereof. Candidates are encouraged to take a foreign language while in high school. Acceptable scores on the College Entrance Examination Board tests or the American College Test are expected of all candidates. If a candidate takes the CEEB, the mathematics level I achievement test is suggested also for those interested in the sciences.

High school seniors with superior ability and maturity may enroll for a limited amount of course work for credit on campus during their senior year or during the summer preceding their senior year, if they have the recommendation of their high school principal and the approval of the admissions committee.

THE BACHELOR OF ARTS DEGREE PROGRAM

General and Advanced Courses. The first two years of study are usually devoted to the student's general education. These courses furnish the foundation and background for advanced education. Work in the student's major is mostly taken on the advanced level, along with advanced electives.

General Education Requirements: The following list is the prescribed general education courses required of all students. The list is by academic divisions; alternative subject disciplines within each division are indicated.

**FINE ARTS**
- Art 100 or Music 100
- Speech Communication 100
- or Theatre 105

**SOCIAL SCIENCES**
- Psychology 100 or Sociology 105
- History 100 or Political Science 105
- Economics 100

**HUMANITIES**
- English 107, 108, 109
- Philosophy 100 or 234
- or 237 or 238
- Religion 105, 106, 107, or 108
- Foreign Language 100, 101, or 102, 103, or 104, 105

**MATHEMATICS AND**

**NATURAL SCIENCES**
- Mathematics 100 or 142 or 147 or 154 or 163
- Biology 100
- Chemistry 100 or 171 or 181
- or Physics 100

**TEACHER EDUCATION**
- Education 100

All students are required to take three hours of physical education credit. (See Department of Health and Physical Education.)

In-Depth Requirements: The College of Arts and Sciences further requires that each student complete two additional courses (six credit hours) in each academic division to attain the B.A. degree. The purpose is to add depth to the general education courses. These two courses are required to be in the same subject discipline in which the student has completed his general education courses; however, the choice of the discipline belongs to the student. Students with departmental majors do not take additional course requirements in the Teacher Education Division. In the division in which the student has selected his major the two additional courses required are fulfilled as a normal part of his major curriculum.

A student must complete all General Education Requirements to attain the B.S. degree, but in-depth courses are not required.
Completing a Major: The degree candidate is required to complete in a logical sequence a major of not less than 45 quarter hours. The faculty adviser assists the student in planning his major by the third quarter of his sophomore year. Candidates for the degree of Bachelor of Arts who expect to teach in the public school are required to satisfy professional education requirements and will have a member of the Department of Education for a professional adviser.

The following major fields are offered toward the Bachelor of Arts degree in the College of Arts and Sciences:

Art
Biology
Chemistry
College Student Personnel
Computer Science
Elementary Education
English/English Writing
French
Gerontology
History
Industrial Technology
Mathematics
Music
Music Education
Music Performance
Health Education
Philosophy
Philosophy and Religion
Physical Education
Physics
Political Science
Psychology
Public Administration
Public Relations
Religion
Sacred Music
Social Work
Sociology
Spanish
Speech and Theatre

Minors: A formal program of academic minors is available in several of the subject matter areas. Consult the chairman of the department in question for specific procedural instructions.

Generally, minors may cross departmental and college lines; minors require a minimum of 30 quarter hours of approved courses, including some work above the 200 level; minors are for non-majors (whereas concentrations are for majors only).

THE BACHELOR OF MUSIC, BACHELOR OF FINE ARTS, AND BACHELOR OF SCIENCE DEGREE PROGRAMS

The patterns of courses and the policies listed under the Bachelor of Arts degree program are also applicable to the Bachelor of Music, Bachelor of Fine Arts, and Bachelor of Science degree programs, except for the In-Depth requirement which is not applicable.

A candidate for the Bachelor of Music degree may major in music education or in performance. A candidate for the Bachelor of Fine Arts degree may concentrate in painting, printmaking, sculpture, ceramics or graphic design. A candidate for the Bachelor of Science degree may major in biology, medical technology, chemistry, industrial technology, or computer science.
TEACHER CERTIFICATION

Ohio Northern University is vitally concerned with preparing effective and efficient teachers. Complete certification programs are offered within the degree requirements in almost every department. (See the Department of Education listing for details.)

Students preparing to teach are expected to make formal application for admission into the Teacher Education program during the quarter in which they will complete 90 quarter hours of course work if they have completed all prerequisites; have completed all prerequisites. To be accepted, the student must have an overall accumulative point average of at least 2.25 in the major field courses with no grade less than “C”; completed at least three-fourths of the prescribed freshman and sophomore course work; and have favorable recommendations from faculty members (as outlined in the Education Department section of this catalog). The Committee on Teacher Education, representing the five divisions of the College of Arts and Sciences, establishes policies for admission into the program of Teacher Education and considers all applications for admission to the Program.

Students preparing to teach are assigned advisers in the Department of Education to assist them with the scheduling of professional education courses and the completion of clinical/field experiences. The adviser in the student’s major department continues to advise the student on the requirements for his major.

Students with degrees from other accredited universities may qualify for teacher certification by completing the required courses in the Department of Education. The Department of Education permits the completion of degree requirements and/or recommendation for teacher certification only when a student demonstrates qualities indicative of competence in teaching.

PREPROFESSIONAL PROGRAMS

Medical Sciences Programs. A Medical Sciences Advisory Committee with representatives from biology, chemistry, mathematics, physics, pharmacology, and a representative from outside the Division of Mathematics and Natural Sciences advises students in the areas of the medical sciences. The general objectives of the committee are to counsel students preparing for a career in the medical sciences, to serve as a source of information concerning preprofessional education in the medical sciences, and to serve as a source of recommendations to professional schools in the medical sciences.

A representative of the committee meets with all students at summer orientation and regularly during their undergraduate careers. The committee provides a guideline and a time table to help a student pursue his career goals. The first year program usually includes biology, chemistry, English, and mathematics. After the first year, with the exceptions of organic chemistry and physics, the program is a function of the student’s choice of departmental major and the professional schools to which he plans to apply. For further information contact Dr. Howard L. Haight, Chairman, Medical Sciences Advisory Committee.
Medical Technology. Most students in medical technology study three years on campus and spend a fourth clinical year at an accredited Medical Technology School. Forty-five quarter hours are transferred from the medical technology school to Ohio Northern University and applied toward a B.S. degree in Medical Technology. Ohio Northern University is affiliated with St. Rita's Medical Center in Lima.

For additional information see the Biology Department program descriptions in this catalog. For detailed curriculum information contact the Medical Technology Adviser, Biology Department.

Pretheology

The recommendations of the American Association of Theological Schools are followed in counseling the pretheological student in planning his program leading to the Bachelor of Arts degree. An interdisciplinary major in the Department of Philosophy and Religion or a major in another appropriate department may be selected.

The chairman of the Department of Philosophy and Religion serves as adviser to the pretheological student in planning his preprofessional program, along with a departmental adviser in his major, if the student elects a major outside the Department of Philosophy and Religion.

Prelaw

The College of Arts and Sciences in cooperation with the Ohio Northern University College of Law has developed a unique prelaw program which offers an excellent opportunity for superior students preparing for a career in law. At the present time Ohio Northern is unaware of any other comparable program in the United States which prepares undergraduate students for law school and then guarantees them preferential treatment in admission to law school after they have successfully completed the program.

Students in the prelaw program select a major and complete the necessary requirements as do other liberal arts students. It is open to students enrolled in any academic department of the College of Arts and Sciences. There is a "prelaw core" for each department comprised of 36 hours of courses to be taken outside the major in addition to general education courses (or their equivalents) prescribed at the 100 level. Courses in the prelaw core may count toward in-depth requirements.

Students are required to take at least one course from each of the prescribed lists of recommended courses. They then are free to select any other courses as prelaw electives from the recommended courses for a total of 36 hours. Prelaw students are encouraged to have a minor or a second major in one of the core disciplines. In that event, the same courses can be counted both toward the prelaw core and the second major or minor.

Prelaw students need a 3.30 G.P.A. overall to qualify for automatic admission to the Ohio Northern University College of Law; transfer students are required to complete at least 75 hours at Ohio Northern with a G.P.A. of 3.40 or better in Ohio Northern courses in order to be automatically admitted to the Ohio Northern College of Law. Students cannot take prelaw core courses on a S-U basis, except where the course is not offered on a
letter grade basis. Those students who qualify for guaranteed admission to the ONU College of Law and have at least a 600 LSAT score will be awarded a $500 scholarship to the ONU College of Law.

Additional information is available from Dr. David Saffell, Chairman of the Prelaw Advisory Committee, or from the department chairman of the student’s major.

COMBINATION CURRICULA

Four and Five Year Combination Curricula

Students pursuing a four-year dual major program in two departments within the College of Arts and Sciences are required to meet each department’s requirements for the major in that discipline. Students pay tuition at the College of Arts and Sciences rate.

The Arts-Engineering, Arts-Pharmacy programs are five year curricula for the student challenged by the rewards of in-depth study in both the Arts and Sciences and the professional fields of Engineering or Pharmacy. The student pursues degrees simultaneously in the College of Arts and Sciences and Engineering or Pharmacy and Allied Health Sciences, pays tuition at the Engineering or Pharmacy College rate, has an adviser in each college, and receives an appropriate degree in each college upon graduation.

Students taking the dual degree in the College of Arts and Sciences and Engineering are required to take advanced mathematics in the first year. The curriculum outline is listed in the Engineering section of this catalog.

Students taking a dual degree in the College of Arts and Sciences and College of Pharmacy and Allied Health Sciences are required to meet the three-year residency requirement to qualify for graduation from the College of Pharmacy and Allied Health Sciences. Students meet all requirements in each college in the same way as students graduating with one degree.

GENERAL REGULATIONS

1. A student may not register for more than 19 hours of academic work unless he achieved a grade point average of 3.00 or better in the preceding quarter, in which case the dean may grant permission for extra hours. A normal program consists of 12 to 19 scheduled hours including physical education.

2. All new students in the College of Arts and Sciences are required to take Freshman Orientation in their major field, normally in the fall quarter.

3. A student indicates his choice of a major field by filling out a declaration of major card available in the office of his department chairman. The faculty adviser assists a student in planning his major not later than the last quarter of his sophomore year.

4. No course for which a student has received a “D” is acceptable toward a major, minor, or area of concentration.

5. A senior student selecting “100” courses is required to consult his department chairman and the dean of the college for permission.
6. A sophomore student is not permitted to take 300/400 courses unless recommended by his adviser and approved in writing by the chairman of the department concerned.

7. Juniors and seniors are expected to schedule a majority of their courses from the “300” and “400” group.

8. With the permission of the instructor and the department chairman, any course prerequisite may be waived.

9. Except where noted, credit hours earned in repeated courses may be counted only one time among the total hours required for graduation.

10. The freshman English courses—English 107, 108, 109—must be taken in sequence and not more than one course may be taken at the same time. One of the three courses must be scheduled every quarter until the student has received credit in all three (unless the student is specifically excused by the academic dean).

S/U Grade Option

Sophomores, juniors, seniors, and post-graduate students in the College of Arts and Sciences are given the opportunity to register for one course per quarter on an S/U option basis, with the following stipulations:

1. The student must be a full-time student in Arts and Sciences.
2. The student must have sophomore, junior, senior or post-graduate standing.
3. The requested course cannot be in the department of the student’s major.
4. The requested course cannot be a 100 level general education course.
5. The requested course cannot be a cognate.
6. The grade of “S” is to be equated with A, B, C. The grade of “U” is equated with D or F.
7. The student cannot change his mind about the grading system after the second week of class.
8. Divisional “in-depth” courses may be taken S/U under the above guidelines.

CLASSIFICATION OF STUDENTS

For purpose of classification the minimum requirement for sophomore standing is 45 quarter hours of academic work; for junior standing, 90 quarter hours with all freshman and sophomore requirements completed; for senior standing, 135 quarter hours.

ACADEMIC PROBATION

A grade point average of 2.0 is required for graduation. If a student’s accumulative grade point average falls below 2.0 within a given quarter, that student is placed on probation and participating in extra-curricular activities is reviewed by his/her advisor, by the Dean of Student Services, and by the dean of the college. If a student’s accumulative grade point average falls below 1.6 within a given quarter, that student cannot participate in extra-curricular activities unless approval is granted by the dean of the college.
Any student on probation whose work for the following quarter continues below a 2.0 will have his/her record reviewed by the Committee on Academic Qualifications of the College and may be recommended to the dean for suspension or dismissal.

SENIOR COMPREHENSIVE EXAMINATION
The requirement of a Senior Comprehensive Examination is a matter of departmental policy. Each department has the authority to decide and to determine all policies regarding senior comprehensive examinations.

Students should consult the departmental sections of this catalog and the department chairman in order to determine the existing policy for senior comprehensive examinations within the respective departments.

GRADUATION
To graduate with a Bachelor of Arts, a Bachelor of Fine Arts or a Bachelor of Science degree, a student is required to complete a minimum of 182 quarter hours which includes the prescribed 16 general education courses, appropriate divisional electives, 3 quarter hours in physical education, and have an accumulative point average of at least 2.0.

To graduate with a Bachelor of Music degree, a student is required to complete a minimum of 182 quarter hours for the concentrations in performance or sacred music or 193 quarter hours for the concentration in music education. The minimum includes the 16 general education courses and 3 quarter hours of physical education; however, no in-depth courses are required.

The minimum residency requirement for all students is the last three quarters and the completion of at least 45 quarter hours with at least 90 quality points elected mostly from 300 and 400 level courses.

Arts and Sciences Courses—General
(Department 100)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>000 ORIENTATION</td>
<td>Familiarization with college requirements, programs and academic services; exploration of academic and career goals; planning program of courses. Required of students who have not declared a major.</td>
<td>1 hour</td>
</tr>
<tr>
<td>121 Career Planning</td>
<td></td>
<td>1 hour</td>
</tr>
<tr>
<td>290 Special Topics</td>
<td></td>
<td>1-3 hours</td>
</tr>
<tr>
<td>101 Military Science - Introduction to ROTC &amp; National Defense</td>
<td>2 hours</td>
<td></td>
</tr>
<tr>
<td>102 Military Science - Rappelling</td>
<td></td>
<td>2 hours</td>
</tr>
<tr>
<td>103 Military Science - Land Navigation</td>
<td></td>
<td>2 hours</td>
</tr>
<tr>
<td>201 Military Science - Individual &amp; Organizational Leadership</td>
<td>2 hours</td>
<td></td>
</tr>
<tr>
<td>202 Military Science - Management Simulation Program</td>
<td>2 hours</td>
<td></td>
</tr>
<tr>
<td>203 Military Science - Management Simulation Program</td>
<td>2 hours</td>
<td></td>
</tr>
</tbody>
</table>
301 Military Science - Ethics & Professionalism 3 hours
302 Military Science 3 3 hours
303 Military Science 3 3 hours
401 Military Science - American Military History 3 hours
402 Military Science 4 3 hours
403 Military Science 4 3 hours

101. AEROSPACE STUDIES I 1 hour
Organization of United States Air Force; mission, function, and employment of U.S. strategic offensive forces; leadership laboratory activities.

102. AEROSPACE STUDIES II 1 hour
United States Air Force doctrine; mission, function, and employment of U.S. strategic defensive forces; general purpose forces; mission, resources, and operation of tactical air forces; capabilities of Army in limited war and counterinsurgency; Navy and Marine Corps; leadership laboratory activities.

103. AEROSPACE STUDIES III 1 hour
United States general purpose forces continued; structure and mission of aerospace support forces; leadership laboratory activities.

201. AEROSPACE STUDIES I 1 hour
Development of air power to 1941. Various concepts of employment of air power and factors which have prompted research and technological change; examples of impact of air power on strategic thought; leadership laboratory activities.

202. AEROSPACE STUDIES II 1 hour
Development of air power 1941-1965. Various concepts of employment of air power and factors which have prompted research and technological change; examples of impact of air power on strategic thought; leadership laboratory activities.

203. AEROSPACE STUDIES III 1 hour
Development of air power 1965 to present. Various concepts of employment of air power and factors which have prompted research and technological change; examples of impact of air power on strategic thought; leadership laboratory activities.

301. AIR FORCE MANAGEMENT I 3 hours
Integrated management course emphasizing individual as manager in Air Force milieu. Oral and written communicative skills; military writing and briefing formats; human behavior; individual behavior within formal organizational and historical development of management thought; leadership laboratory activities.
302. AIR FORCE MANAGEMENT II 3 hours
Continuation of 100-301. Air Force leadership, discussion of classical leadership theory, i.e., trait, situational, interactional, likert, 3-D, etc. Planning, organizing, coordinating, directing, and controlling functions of management; emphasis on Air Force application; command and staff concept; leadership laboratory activities.

303. AIR FORCE MANAGEMENT III 3 hours
Continuation of 302. Junior officer as administrative leader; Air Force personnel system; use of civilian personnel in Department of Defense; management of change; organization and personal value conflicts; managerial strategies in changing world; leadership laboratory activities.

362. AEROSPACE STUDIES: FLIGHT INSTRUCTION PROGRAM I 2 hours
Theory of flight; aerodynamics; federal aviation regulations; aviation map and chart interpretation; flight computer; radio communication procedures; aircraft operation; flying safety. Required of AFROTC category 1P student.

363. AEROSPACE STUDIES: FLIGHT INSTRUCTION PROGRAM II 2 hours
Study and application of dead-reckoning and pilotage navigation; radio navigation; weight and balance; meteorology; aircraft performance and instruction in basic flight maneuvers. Required of AFROTC category 1P student.

411. AEROSPACE STUDIES I 3 hours
National security forces in contemporary American society; armed forces as integral element of society; American civil-military relations and environmental context in which defense policy is formulated; leadership laboratory activities.

412. AEROSPACE STUDIES II 3 hours
The formulation and implementation of United States defense policy; the framework of defense policy to include the domestic and international system; the evolution of U.S. strategy from Truman to Carter; leadership laboratory activities.

413. AEROSPACE STUDIES III 3 hours
Strategy and the management of conflict; arms interaction and control; limited war, insurgency, counterinsurgency, and international terrorism. Uniform Code of Military Justice. Initial Active Duty (IAD) Orientation. Leadership laboratory activities.

461. AEROSPACE STUDIES: FLIGHT INSTRUCTION PROGRAM I 2 hours
Aircraft operation, flight safety, rules of the air, instruction in advanced flight maneuvers, navigation techniques. Limited to and required of AFROTC 1P student.
THE DEPARTMENTAL COURSES

ART
(Department 151)

Professors Gordon (Chairman), DeVore, J. West; Associate Professor Chesser (On leave 1981-82); Instructor Albert.

The department seeks to develop within the student an understanding of the fine arts, to foster within the university an awareness of art as an essential ingredient of an educated person, and to provide the opportunity for the student to develop proficiency in various art media.

The artist should be educated comprehensively through a program combining professional training and broad study in the liberal arts. It is on this premise that the student majoring in art: (1) receives as broad an understanding of art as possible; (2) becomes acquainted with historical and cultural knowledge of the past and present; (3) develops a working proficiency through mastery of the tools and skills of his profession; (4) develops personal modes of expression in the media of the visual arts; and (5) acquires an awareness of any competency in other academic disciplines.

A student seeking a Bachelor of Arts degree with a major in Art must complete 76 hours for the major including 151, 152, 161, 162, 210 (6 hours) 255, 350, 265, 489, 6 hours selected from 270, 280, 370, 380, 9 hours selected from 250, 251, 355, 420, and 9 hours selected from 325, 335, 344, 345, 346, 347.

A candidate for the Bachelor of Fine Arts degree must complete 97 hours for the major including 151, 152, 161, 162, 210 (9 hours), 222, 255, 350, 265, 360, 489, 9 hours selected from 270, 280, 370, 380, 9 hours selected from 250, 251, 355, 12 hours selected from 325, 335, 344, 345, 346, 347. Students concentrating in Ceramics, Painting, Printmaking or Sculpture must complete a minimum of 24 hours in the area of major concentration. Students concentrating in Graphic Design must complete 15 hours of 471.

A student may obtain a minor in art by completing 151, 152, 161, 162, and 18 quarter hours of art electives. Students are urged to confer with a faculty advisor in order to make an appropriate selection of course work.

Professional education requirements are listed by the Department of Education.

A comprehensive examination in art and a public exhibition of the student’s studio work are required for graduation with a major in art.

Portfolios are required for all applications for scholarships as well as for all applications for admission with advanced standing. While portfolios are not required of entering freshmen, their submission tends to expedite admission.

000. ORIENTATION 1 hour
Familiarization with the department, requirements for majors, planning program of courses, university catalog, and library. Required of all majors in the department.

100. ART 3 hours
Analysis of the visual arts through selected works from the past and present. Illustrated lecture.
114. ART FOR ELEMENTARY TEACHERS  3 hours
For prospective classroom teachers with emphasis on theory, media, and techniques. Open only to elementary majors.

115. ART FOR ELEMENTARY TEACHERS  3 hours
Continuation of Art 114.

151. DRAWING I  3 hours
Introduction to methods and media of drawing. Required of all art majors.

152. DRAWING II  3 hours
Extended problems of rendering in line and tone, studies in perspective.

161. DESIGN I  3 hours
Introduction to and application of the elements and principles of plastic and graphic design. Required of all Art majors.

162. DESIGN II  3 hours
Organization of elements and principles in three dimensions.

210. FIGURE DRAWING  3 hours
Drawing and anatomical study of the human figure. May repeat for credit to total of 12 hours.

221. JEWELRY  3 hours
Use of a variety of materials in the making of jewelry. Emphasis on design and the development of technical skills. May repeat for credit once. 3 hours.

222. GRAPHIC DESIGN  3 hours
Basic letter forms, emphasis on proportion, theory, rendering technique and applications of lettering in commercial art. May repeat for credit once.

250. PAINTING I  3 hours
An introduction to techniques and modes of painting. Emphasis on theory and use of color.

251. PAINTING II  3 hours
Techniques and modes of painting in oil. May repeat for credit to a total of 6 hours. Prerequisite: painting I

255. CERAMICS I  3 hours
Methods and techniques of forming clay products with emphasis on hand construction. Introduction to work on the potters wheel. Decorating, glazing and firing of ceramic ware.

265. SCULPTURE I  3 hours
An introduction to the design and rendering of sculptural form in a variety of media and techniques. Emphasis on organizational problems of form and space.
270. RELIEF PRINTMAKING 3 hours
Woodcut, linocut, wood engraving and other relief techniques. May repeat for total of 6 hours.

280. SERIGRAPHY 3 hours
Methods and techniques. May repeat for total of 6 hours.

290. SPECIAL TOPICS IN ART 1-3 hours

305. ANCIENT AND MEDIEVAL ART 3 hours
Art forms and styles from prehistoric times through the 14th century. Not available to students who have received credit for 344 or 345. Offered alternate years.

315. RENAISSANCE AND BAROQUE ART 3 hours
The development of European Art and architecture from the 15th through the 18th century. Not available to students who have received credit for 346 or 347. Offered alternate years.

325. IMPRESSIONISM-POST IMPRESSIONISM 3 hours
Emphasis on developments in French art between the Revolution of 1784 and 1900. Offered alternate years.

335. CONTEMPORARY TRENDS 3 hours
Emphasis on formation and development of basic artistic movements from the beginning of the 20th century to the present. Offered alternate years.

350. CERAMICS II 3 hours
Methods and techniques of forming, decorating, glazing and firing clay bodies. Emphasis on wheel throwing. May repeat for a total of nine 9 hours credit. Prerequisite: Art 255.

355. WATERCOLOR 3 hours
Techniques and modes of painting in aqueous media. May repeat for credit to a total of 6 hours.

360. SCULPTURE II 3 hours
The design and rendering of sculptural forms in a variety of media and techniques. May repeat to total of 9 hours. Prerequisite: Art 265.

370. LITHOGRAPHY 3 hours
Methods and techniques. May repeat to total credit of 6 hours. Prerequisites: Art 152, 162, and 210.

380. INTAGLIO PRINTMAKING 3 hours
Methods and techniques of etching and engraving. May repeat to total credit of 6 hours. Prerequisites: Art 152, 162, and 210.
410. ADVANCED CERAMICS  3 hours
Directed study. May repeat to total credit of 12 hours. Prerequisite: 9 hours of Art 350.

415. ADVANCED PRINTMAKING  3 hours
Directed study. May repeat to total credit of 12 hours. Prerequisite: 6 hours of printmaking.

420. ADVANCED PAINTING  3 hours
Directed study. May repeat to total credit of 12 hours. Prerequisite: 6 hours of Art 251.

425. ADVANCED SCULPTURE  3 hours
Directed study. May repeat to total credit of 12 hours. Prerequisite: 9 hours of Art 360.

457. ART EDUCATION METHODS  3 hours
Laboratory-seminar dealing with materials, techniques, and methods of secondary classroom instruction in art. Meets professional education requirement in methods area.

471. INTERNSHIP  15 hours
Supervised field experience in an approved commercial art studio, agency, or design department; full time five days a week. Prerequisite: senior rank; 6 hours of Art 222, 500-372, 142-322, 142-330, permission of the department. Application for this course must be made through the student's advisor to the department chairman not later than one full quarter in advance of enrollment.

489. SENIOR THESIS  1 hour
Required of all art majors. Preparation for and evaluation of the comprehensive examination and exhibit. Arrangements for this course must be made one quarter in advance with the student's advisor and the department chairman.

490. SPECIAL TOPICS IN ART  1-3 hours

494. SEMINAR IN ART  1-3 hours

497. INDEPENDENT STUDY IN ART  1-3 hours

BIOLoGY
(Department 121)
Professors Butler, Nelson; Associate Professors Keiser, Laing, Moore (Chairman); Assistant Professor Mayer; Instructor McGraw; Adjunct Faculty, St. Rita's Medical Center, H. Cheng, J. Evans.
The objectives of the department are to develop in each student an understanding of the nature and content of the biological sciences. Biology 100 is a principles course with a major emphasis on the study of the cell and
genetics. It provides generalizations by which advanced courses in biology can be related to one another and is therefore a prerequisite to all other courses in the curriculum. Students desiring further knowledge of general biology may take biology 112 and 113 which develop an understanding of microbial, plant and animal life, evolution and ecology. These courses also provide a firm foundation for advanced work in biology and the related applied sciences.

The biology department offers majors in both the B.A. and the B.S. degree with the opportunity to specialize in pre-medical sciences, field biology or secondary education. Requirements for both degrees are biology 100, 112, 113, 195, one advanced systematic survey course such as biology 204, or biology 233, one advanced organismic course such as biology 205, 301, 331 or 351, one field biology course such as biology 213, 251, with 252, 355, 383, 423 and one course in genetics 430 with 431 and 495. A minimum of 16 hours is to be elected from among the following courses, excluding those which have been taken as required courses: biology 204, 205, 213, 223, 231, 232, 233, 244, 251, 252, 290, 297, 300, 301, 321, 331, 332, 333, 343, 351, 355, 383, 423, 424, 425, 441, 481, 490, 497. In addition, from the College of Pharmacy and Allied Health Sciences 361, 362, 372, and 462 are accepted as electives. No student may receive biology credit for both 231 and 331, nor 232 and 332 nor 233 and 333. A minimum of forty-five hours of biology courses is required. Required cognates include 3 quarters of chemistry, 2 quarters of mathematical sciences, one quarter of physics or one additional quarter of mathematics, which may be satisfied by a course in computer programming. A minimum of 25 quarter hours is required in the departments of chemistry, mathematics and physics.

The requirements for the B.S. degree include all of the preceding requirements for the B.A. degree plus twenty additional hours to be taken in the Division of Mathematical and Natural Sciences in The College of Arts and Sciences and/or The College of Engineering and Pharmacy and Allied Health Sciences. These twenty hours are subject to the approval of the advisor and replace the six in-depth courses required by the Arts and Sciences College for the B.A. program.

These courses are subject to the approval of the advisor.

A student may wish to minor in biology. A minimum of thirty quarter hours of biology is required. Required courses are the same as for a major in biology with the exception of 195 and 495 which are not required. Two to three hours of biology electives will be required to complete the requirement of thirty quarter hours of biology. Required cognate courses include twelve quarter hours in the Division of Mathematical and Natural Sciences, not including biology.

The Biology Department offers an established medical technology program in affiliation with St. Rita’s Medical Center of Lima. The program consists of three pre-technical years on campus, during which time the following curriculum will be completed: biology 100, 112, 113, 195, 223, 301, 321, 331, 343, 430, 431, 495 and microbiology 362 offered in the College of Pharmacy and Allied Health Sciences. Preparation in other areas of natural science include chemistry 171, 172, 173, 231, 232, 233 and biochemistry 341
offered in the College of Pharmacy and Allied Health Sciences, eight quarter hours of mathematics, including computer programming, and basic electronics offered in the physics department. Upon the successful completion of the clinical year the student graduates with a B.S. in Medical Technology from Ohio Northern University. The medical technology student may also choose to graduate with a B.S. degree with a major in biology, and then after graduation complete the clinical year. The sixteen courses taken during the clinical year at St. Rita’s Medical Center are listed below and numbered from 460 to 475.

Department advisors will aid students who have selected biology as a major in choosing relevant electives.

The Biology Department has developed an internship program and has formed working relationships with several organizations and institutions. Juniors and seniors, with faculty approval, have the opportunity of gaining practical experience in ecology, environmental testing, zoo care, wildlife management, laboratory research, forestry, hospital and allied health areas. The student will be given 15 hours credit for one quarter of such field experience.

Before embarking on such a program the student will have taken at least two years’ work in the fundamentals of biology and related areas.

100. BIOLOGY (4 + 1)  4 hours
Biological principles and concepts of plant and animal life with emphasis on life at the cellular level and genetics. Laboratory material is made available and discussed when appropriate.

112. GENERAL BIOLOGY (4+1)  4 hours
The diversity that exists among living organisms and exemplified by the major groups of living organisms: prokaryotes, protists, fungi, plants and animals. Evolution and ecology are considered. Laboratory material is made available and discussed when appropriate. Prerequisite: Biology 100.

113. GENERAL BIOLOGY (4+1)  4 hours
Biological principles and concepts of the reproduction, development, growth, anatomy and physiology of plants and animals. Laboratory material is made available and discussed when appropriate. Prerequisite: Biology 100.

195. SEMINAR (1 + 0)  1 hour
Readings, discussions and reports on problems of historical and current interest in biology. Required of all prospective biology majors. Graded S-U.

204. BOTANY AND MYCOLOGY (2 + 4)  4 hours
Plant and fungal relationships including phylogeny and classification. The morphology, physiology, development and life cycles of selected taxa. Prerequisites: Biology 112 and 113.

205. ANGIOSPERM BOTANY (2 + 4)  4 hours
Relationships within the flowering plant division including phylogeny and classification. The morphology, physiology, development and life cycles of the flowering plants. Prerequisites: Biology 112 and 113.
213. NATURAL HISTORY (1 + 6) 3 hours
Recognition and identification of local biotic communities and their inhabitants. Field study emphasized. Prerequisites: Biology 112 or permission of the instructor.

223. INVERTEBRATE ZOOLOGY (2 + 4) 4 hours
Invertebrate relationships including morphology, physiology, life cycles and taxonomy. Prerequisite: Biology 112.

231. ANATOMY AND PHYSIOLOGY (4 + 2) 4 hours
Basic principles of human body structure and function, including the physiology of exercise. The courses must be taken in the indicated sequence. Each course is a prerequisite for the succeeding course. Prerequisite: Biology 113.

232. ANATOMY AND PHYSIOLOGY (4 + 2) 4 hours
Continuation of 231.

233. ANATOMY AND PHYSIOLOGY (4 + 2) 4 hours
Continuation of 232.

244. THE ENVIRONMENT OF MAN (2 + 0) 2 hours
The interactions of man and his surroundings with emphasis on the problems arising from increasing human population.

251. PRINCIPLES OF VERTEBRATE ECOLOGY (3 + 0) 3 hours
Consideration of vertebrate populations, evolution, geography and of vertebrate roles in ecosystems and biotic communities. Prerequisites: Biology 112 and 113. Offered alternate years.

252. PRINCIPLES OF VERTEBRATE ECOLOGY LABORATORY (0 + 3) 1 hour
Field work on populations and habitat distribution of vertebrates. Collected data is analyzed. Prerequisite or corequisite: Biology 251.

290. SPECIAL TOPICS IN BIOLOGY 1-3 hours
Grading system at the discretion of the instructor.

297. INTRODUCTION TO BIOLOGICAL INVESTIGATIONS 1-3 hours
Minor investigations for qualified freshmen and sophomores. Graded S-U.

300. HUMAN ANATOMY AND HISTOLOGY (2 + 4) 4 hours
A study of the organs and tissues that comprise the systems of the human body. Prerequisite: Biology 113.

301. DEVELOPMENTAL ANATOMY (2 + 4) 4 hours
A study of the human embryonic and fetal development supplemented by laboratory studies of chick, pig and rat embryonic development. Prerequisite: Biology 113.
321. IMMUNOLOGY (3 + 0) 3 hours
Basic anatomical, physiological, and genetic principles of immunology with some reference to clinical application. Prerequisites: Biology 100,113; one year of chemistry.

331. PHYSIOLOGY (3 + 3) 4 hours
A structural and functional approach to the human body including physiological principles at the cellular, tissue and organ-system level. Prerequisites: Biology 113 and one year of chemistry. Corequisite: Chemistry 231.

332. PHYSIOLOGY (3 + 3) 4 hours
Continuation of 331. Corequisite: Chemistry 232.

333. PHYSIOLOGY (3 + 3) 4 hours
Continuation of 332. Corequisite: Chemistry 233.

343. MICROTECHNIQUE (2 + 3) 3 hours
Principles and procedures used in the preparation of biological specimens for microscopic study. Open to sophomores majoring in Biology.

351. CELL BIOLOGY (3 + 3) 4 hours
Function and structure of cells. Bioenergetics, enzyme action, and subcellular entities (their structure, function, origin and development). Some consideration of interaction between cells. Prerequisites: Biology 112,113; Chemistry 173. Offered alternate years.

355. INTRODUCTION TO MARINE BIOLOGY 3 hours
The various marine environments and the organisms that inhabit them. A two-week field trip to a marine environment is required. May repeat for credit four times. Prerequisites: Biology 112 and permission of the instructor.

383. ANIMAL BEHAVIOR AND ETHOLOGY (2 + 2) 3 hours
Basic principles of the behavior and ethology of invertebrates and vertebrates, stressing observational and descriptive techniques. Prerequisites: Biology 112,113 and 223. Offered alternate years.

423. ECOLOGY (2 + 2) 3 hours
Populations, communities and biomes. The composition, morphology, ecology chorology or geography, chronology or history and taxonomy of populations, communities and biomes. Prerequisites: Biology 112 and 113.

424. VEGETATION OF THE GREAT SMOKY MOUNTAINS (1 + 2) 1 hour
A three-day field study of the regional vegetation patterns in relation to altitude and topography. Prerequisites: Biology 100, 112, 113 and 213 or Biology 423. Corequisites: Either Biology 213 or 423. Biology 100, 112, and 113 must be offered as a prerequisite if Biology 213 is offered as a corequisite. A special travel fee is assessed. Permission of the instructor.
425. VEGETATION OF THE SOUTHERN LAKE MICHIGAN REGION (1 + 2)
A three-day field study of regional vegetation patterns in relation to glacial and coastal lacustrine landforms. Emphasis on concepts of regional secession. Prerequisites: Either Biology 100, 112, 113 and 213 or Biology 423. Corequisites: Either Biology 213 or 423. Biology 100, 112 and 113 must be offered as a prerequisite if Biology 213 is offered as a corequisite. A special travel fee is assessed. Permission of the instructor.

430. GENETICS (3 + 0)
3 hours
The principles of genetics as exemplified by microorganisms, higher plants and animals. Mendelian, biochemical, developmental and population genetics are considered. Prerequisites: Biology 113, one year of chemistry and 123-142.

431. GENETICS LABORATORY (0 + 3)
1 hour
Experiments which demonstrate genetic phenomena. Drosophila, bacteria, microscope slides and probability studies are employed. Corequisite: Biology 430

441. PHYSIOLOGY OF AGING (1 + 0)
1 hour
A seminar format with readings, lectures and discussions concerning known physiological process of aging in the systems of the human body. Prerequisites: Biology 231, 232 and 233 or 331, 332 and 333 or with permission of the instructor.

451. ADVANCED TOPICS IN CELL BIOLOGY (3 + 0)
3 hours
A study of the current literature on selected topics in cell biology. No topic will be repeated in a four year period, so the course may be repeated for credit. Prerequisites: Chemistry 233 and Biology 351 or 312-342 Biochemistry. Offered alternate years.

481. INTERNSHIP PROGRAM
15 hours
Juniors and seniors, with faculty approval, have the opportunity of gaining practical experience in ecology, wildlife management, forestry and hospital experience including cardiology through working relationships with organizations and institutions. Prerequisite: 2 years work in the fundamentals of Biology and related areas.

490. SPECIAL TOPICS IN BIOLOGY
1-4 hours
The biology staff is prepared to offer courses to students in the following disciplines: entomology, biogeography, herpetology, ichthyology, mammalogy, ornithology and plant taxonomy. Grading system at the discretion of the instructor.

495. SEMINAR IN BIOLOGY
1 hour
Graded S-U.

497. INDEPENDENT STUDY IN BIOLOGY
1-3 hours
Graded S-U.
The following courses are offered at the St. Rita’s Medical Center. Prerequisites for enrollment is admission to the Medical Technology Program by St. Rita’s Medical Center. Students enroll for three courses at the offering institution.

460. ORIENTATION TO MEDICAL TECHNOLOGY 0 hours
An introduction to basic laboratory instruments, methods, procedures, terminology, ethics, and safety.

461. CLINICAL BACTERIOLOGY - LECTURE 4 hours
Study of micro-organisms found in human infection, principles of isolation and identification.

462. CLINICAL MYCOLOGY - LECTURE 2 hours
Study of fungi found in human infection, principles of isolation and identification.

463. CLINICAL PARASITOLOGY - LECTURE 2 hours
Study of parasites found in human infection, principles of isolation and identification.

464. CLINICAL MICROBIOLOGY LABORATORY 6 hours
Laboratory methods, procedures, and instrumentation to correlate with Bacteriology, Mycology, and Parasitology lectures.

465. IMMUNOHEMATOLOGY LECTURE 3 hours
Theory of human blood groups, compatibility testing, detection, and identification of antibodies.

466. IMMUNOHEMATOLOGY LABORATORY 3 hours
Laboratory methods and instrumentation to correlate with lectures.

467. CLINICAL IMMUNOLOGY LECTURE 2 hours
Theory of information and detection of antigens and antibodies in disease states, both in vivo and vitro.

468. CLINICAL IMMUNOLOGY LABORATORY 2 hours
Laboratory methods and instrumentation to correlate with lectures.

469. CLINICAL HEMATOLOGY/COAGULATION LECTURE 4 hours
Theory of hematopoiesis, cell morphology, blood dyscrasias, coagulation mechanism and abnormalities. Correlation of findings with human physiology and disease.

470. CLINICAL HEMATOLOGY/COAGULATION LABORATORY 4 hours
Laboratory instrumentation and procedures to correlate with the lectures.
471. CLINICAL CHEMISTRY LECTURE  
Theory of chemical constituents of body fluids in normal and disease states. Includes General Chemistry, Toxicology and DIA, Instrumentation, Statistics and Quality Control.  

472. CLINICAL CHEMISTRY LABORATORY  
Laboratory instrumentation and procedures to correlate with the lectures.  

473. URINALYSIS LECTURE  
Physiology of urinary system, related diseases and correlation to disease states.  

474. URINALYSIS LABORATORY  
Laboratory methods and instrumentation to correlate with lectures.  

475. LABORATORY MANAGEMENT LECTURE P/F  
Theory and discussion of supervision and management.  

CHEMISTRY  
(Department 122)  
Professors Haight, Hawbecker (Chairman), Wilhelm; Associate Professors Holmes, Kurtz, Lamb; Assistant Professors J. Hruschka, Renkes, Sadurski; Lecturer Bush.  
The objectives of this department are to help serve the cultural need for an understanding of science in our modern society, to provide the basic preparation in chemistry for those who plan to enter the chemical industry, the teaching profession, pursue graduate study in chemistry or related fields, and to serve those who need an understanding of the fundamentals of this physical science as a prerequisite to various professional studies and career goals.  
The Department of Chemistry is on the list of departments approved by the American Chemical Society for the professional education of chemists and offers both the Bachelor of Arts and Bachelor of Science degrees.  

MAJOR IN CHEMISTRY  
The basic Bachelor of Arts degree program for those who wish to become chemists or follow a preprofessional program such as premedicine or intend to pursue graduate study includes the following courses: chemistry 000, 181-182-183, 241-242-243, 341-342-343, 304, 324, 351, and 494. The following cognate courses must be added: mathematics 163, 261, 262, and 263; physics 231-232-233 with related laboratory. Interested students should note that two courses in biochemistry are also available in the College of Pharmacy and Allied Health Sciences.  
The student who wishes to be certified as a professional chemist by the American Chemical Society must add the following courses: chemistry 451, 462, and two of the following units: I, chemistry 473; II, chemistry 474; III, chemistry 476; IV, chemistry 481-482-483; V, an advanced mathematics or physics course approved by the department.
This certified degree program may lead to either the Bachelor of Arts degree or the Bachelor of Science degree. For the former degree the student must complete all general education and in-depth requirements, while the latter degree requires only the general education courses.

A modified Bachelor of Arts degree program is available for those who wish to prepare for related areas such as certain medical sciences areas, sales or management in the technical industries, patent law, scientific communication and information retrieval, and environmental science. This program permits more course selection in areas that support the student's chemistry-related career goal. The student participates in designing his own program within the following framework: chemistry 000, 181-182-183, 241-242-243, 494, plus three courses from among 304, 342, 337, 351, and a minimum of 12 credit hours in 300-400 level courses in the Division of Mathematical and Natural Sciences or other 300-400 level courses acceptable to the department. In addition, two of the following three cognate units must be selected: I, physics 211-212-213 or 231-232-233 with related laboratories; II, biology 100-112-113; III, three mathematics courses beyond mathematics 100.

MINOR IN CHEMISTRY
A student wishing to receive a minor in chemistry should complete the following: Chemistry 181-182-183 (or 171-172-173) and 241-242 (or 231-232) plus three additional courses from among Chemistry 243 (or 233), 304, 324, 337, 351, 363, and Biochemistry 341.

000. ORIENTATION (1 + 0) 1 hour
Familiarization with the department, requirements for majors, planning program of courses, university catalog, career planning and library. Required of department majors. Course marked S or U.

100. CHEMISTRY (2 + 2) 3 hours
Orientation to and understanding of the fundamental nature of chemistry; models and measurements. Chemistry 171 recommended for science majors. Credit may be received for either Chemistry 100 or 171, but not for both.

114. CHEMISTRY OF LIFE (3 + 0) 3 hours
An introduction to the chemical nature of the major groups of biological molecules and to their activities in living systems. Credit may be received for either Chemistry 114 or Biochemistry 341-342, but not for both. Prerequisite: Chemistry 100, 162 or 171.

115. ENVIRONMENTAL CHEMISTRY (3 + 0) 3 hours
A study of the chemical aspects of the natural and polluted environment. Particular emphasis is given to air and water pollution. Prerequisite: Chemistry 100, 162 or 171.
162. CHEMISTRY-CONCEPTS AND APPLICATIONS I (4 + 3)  5 hours
A survey of fundamental concepts of chemistry. Basic chemical theories are introduced and applied to practical situations. The laboratory is designed to reinforce the lecture program. Prerequisite: Mathematics 261 and Physics 231-2-3 with related laboratory, or the equivalent, or permission of the Chairman.

163. CHEMISTRY-CONCEPTS AND APPLICATIONS II (3 + 0)  3 hours
A study of the chemical properties of the elements and the application of those properties to such problems as synthesis, analysis, industrial processes and environmental quality. Prerequisite: Chemistry 162.

168. BASICS OF CHEMISTRY (3 + 0)  3 hours
A study of the basic skills and concepts needed to understand the nature of chemical processes. Recommended for students with little or no previous background in chemistry prior to entry into Chemistry 171. Students who have had high school chemistry ordinarily begin with Chemistry 171. Chemistry 168 does not satisfy a general education requirement.

169. BASICS OF CHEMISTRY LABORATORY (0 + 2)  1 hour
This laboratory is recommended as a complement to Chemistry 168. It emphasizes basic skills and techniques. Course marked S or U.

171. INTRODUCTORY CHEMISTRY I (4 + 3)  5 hours
Fundamental principles of chemistry in terms of the atomic theory and its application to compound formation, bonding, structure, acid-base and oxidation-reduction reaction chemistry. The laboratory relates physical observations to the principles presented in lecture. Credit may be received for either Chemistry 100 or 171, but not for both. High school chemistry or the equivalent is required.

172. INTRODUCTORY CHEMISTRY II (4 + 3)  5 hours
Physical principles of chemistry including electrochemistry, thermodynamics, kinetics, general equilibrium and the study of the states of matter. The laboratory introduces quantitative measurements to experiments designed to illustrate principles presented in lecture. Prerequisite: Chemistry 171.

173. INTRODUCTORY CHEMISTRY III (4 + 3)  5 hours
Qualitative and quantitative aspects of chemical reactivity including ionic equilibrium, spectroscopy, descriptive inorganic reaction chemistry and nuclear chemistry. The laboratory illustrates qualitative and quantitative behavior and group trends of chemical species. Prerequisite: Chemistry 162 or 172.

181. INTRODUCTORY CHEMISTRY FOR MAJORS (4 + 3)  5 hours
The same lecture and laboratory as Chemistry 171.

182. INTRODUCTORY CHEMISTRY FOR MAJORS (4 + 3)  5 hours
The same lecture and laboratory as chemistry 172.
183. INTRODUCTORY CHEMISTRY FOR MAJORS (4 + 3) 5 hours
The same lecture and laboratory as chemistry 173.

231. ORGANIC CHEMISTRY (3 + 3) 4 hours
An application of concepts of bonding, structure, synthesis and mechanisms to the chemistry of organic compounds. The laboratory program emphasizes special laboratory techniques and synthetic procedures, including methods of separation and identification. Prerequisite: Chemistry 173 or 183.

232. ORGANIC CHEMISTRY (3 + 3) 4 hours
Continuation of 231.

233. ORGANIC CHEMISTRY (3 + 3) 4 hours
Continuation of 232.

241. ORGANIC CHEMISTRY FOR MAJORS (3 + 3) 4 hours
The same lecture and laboratory as Chemistry 231. Prerequisite: Chemistry 173 or 183.

242. ORGANIC CHEMISTRY FOR MAJORS (3 + 3) 4 hours
Continuation of 241 with the same lecture and laboratory as Chemistry 232.

243. ORGANIC CHEMISTRY FOR MAJORS (3 + 6) 5 hours
The same lecture as Chemistry 233 with separate laboratory emphasizing qualitative organic analysis and the use of modern instrumentation in the separation and identification of organic compounds. Prerequisite: Chemistry 232 or 242.

290. SPECIAL TOPICS IN CHEMISTRY 1-3 hours

297. INDEPENDENT STUDY IN CHEMISTRY 1-3 hours
Prerequisite: Approval of the department chairman.

304. ORGANIC SYNTHESIS (2 + 6) 4 hours
An intermediate course in synthetic methods. Lecture emphasizes major carbon skeletal alteration techniques and modern methods of interconverting functional groups. Laboratory consists of planning and executing multistep syntheses of graded complexity. Use of synthetic literature is emphasized. Prerequisite: Chemistry 233 or 243.

324. INTERMEDIATE INORGANIC CHEMISTRY (3 + 3) 4 hours
Preparation, properties and reactions of main group and transition metal elements and their compounds. Laboratory involves the application of fundamental techniques to the synthesis of these compounds and the systematic study of their reactions and properties. Prerequisites: Chemistry 231 or 241 or approval of chairman.
337. ELEMENTS OF PHYSICAL CHEMISTRY (4 + 0) 4 hours
A survey of fundamental principles of physical chemistry including classical thermodynamics, gaseous state, liquid state, macromolecules, quantum theory and spectroscopy. Applications to biological systems are emphasized. Prerequisite: Chemistry 232 or 242; three courses from Department of Mathematics and Computer Science.

341. PHYSICAL CHEMISTRY I (3 + 3) 4 hours
Classical thermodynamics, kinetics, quantum theory, spectroscopy, statistical thermodynamics and structure of matter. Laboratory illustrates principles. A knowledge of computer programming is recommended. Prerequisite: Chemistry 233 or 243; Physics 231, 232, 233 with related laboratories, and Mathematics 263.

342. PHYSICAL CHEMISTRY II (3 + 3) 4 hours
Continuation of 341.

343. PHYSICAL CHEMISTRY III (3 + 3) 4 hours
Continuation of 342.

351. INTERMEDIATE QUANTITATIVE ANALYSIS (2 + 6) 4 hours
The practice and principles of modern "wet" chemical methods of analysis; an introduction to instrumental methods of analysis. A terminal course for the non-major and an intermediate course for the major. Prerequisite: Chemistry 173 or 183.

363. APPLICATIONS OF CHEMICAL INSTRUMENTATION (1 + 5) 3 hours
An introduction to the principles and methods of instrumental measurements for the analysis of real samples. The integrated laboratory and lecture deal with the collection, preparation and analysis of environmental, geological, biological, and industrial samples. Automated sequencing and process analysis are also discussed. Prerequisites: Chemistry 163 or 233 or 243.

451. ADVANCED INORGANIC CHEMISTRY (3 + 3) 4 hours
The study of properties and reaction mechanisms of elements and their compounds in terms of modern theories and concepts. Laboratory involves the application of modern techniques and equipment to the systematic study of compound preparation and related properties. Prerequisites: Chemistry 324 and 343 or approval of chairman.

462. ADVANCED ANALYTICAL CHEMISTRY (3 + 3) 4 hours
Theoretical-experimental study of modern methods of instrumental analysis. The physico-chemical principles as well as the design and use of chemical instrumentation. Laboratory stresses independent, investigative experimentation. Prerequisite: Chemistry 351 and 343, or approval of department chairman.
473. ADVANCED TOPICS IN PHYSICAL CHEMISTRY (3 + 0) 3 hours
A theoretical study of selected topics in chemical physics. Use of current literature is emphasized. A knowledge of computer programming is recommended. Prerequisite: Chemistry 343.

474. THEORETICAL ORGANIC CHEMISTRY (3 + 0) 3 hours
Application of molecular orbital theory and various thermodynamic relationships to the study of organic reaction mechanisms. Structure-reactivity relationships are emphasized. Prerequisite: Chemistry 304 and 343; or approval of department chairman.

476. NUCLEAR CHEMISTRY (2 + 3) 3 hours
Fundamentals of radioactive decay, characteristics of ionizing radiation, statistics of radioactive decay, nuclear safety and use of radiotracers in chemical studies. Prerequisite: Chemistry 343 or approval of department chairman.

481. SENIOR RESEARCH I 2 hours
Prerequisite: Approval of the department chairman.

482. SENIOR RESEARCH II 2 hours
Prerequisite: Approval of the department chairman.

483. SENIOR RESEARCH III 2 hours
Prerequisite: Approval of department chairman.

490. SPECIAL TOPICS IN CHEMISTRY 1-3 hours

494. SEMINAR IN CHEMISTRY 1 hour
Includes oral presentation of a seminar lesson plus a formal paper on a chemical topic related to a selected seminar theme. Required of all senior chemistry majors.

497. INDEPENDENT STUDY IN CHEMISTRY 1-3 hours
Prerequisite: Approval of department chairman.

BIOCHEMISTRY
See course description for Biochemistry 341-342 under the Department of Pharmacology and Biomedical Sciences in the College of Pharmacy and Allied Health Sciences.

EDUCATION
(Department 141)
Professors Miller, Rubeck; Associate Professors Crider, Haynes, Perry, Traxler (Acting Chairman); Instructor Heath; Lecturers Allen, Neiswander, Ruck, Stumpp.

The Teacher Education Program is designed to provide the prospective teacher with the general education, subject area concentration, and
professional education experiences that will enable the student to enter the profession of teaching with competency.

A Provisional Certificate valid for four years is issued by the State of Ohio to students who earn the baccalaureate degree, including at least 55 credit hours in professional education for elementary education certification, 39 credit hours in professional education for secondary education certification, or 43 credit hours in professional education for all grades (K-12) certification; and are recommended by the University as having desirable personal qualities.

Students in the program of Teacher Education (elementary, secondary, all-grades) are required to participate in a minimum of 300 hours of supervised field/clinical experience before student teaching. Of these hours at least half must be in school-related experiences. Of these school-related hours, many if not all of them will be a part of professional education courses, including all methods courses. At least 50 hours must be in clinical field experiences. (Additional information about clinical and field experiences is available in the department of education and from the professional education advisers.)

ADMISSION TO THE PROGRAM OF TEACHER EDUCATION

All students seeking certification to teach are required to make formal application for admission to the program of Teacher Education when they meet the following requirements:

1. Successfully completed 90 quarter hours.
2. Completed and have recorded a minimum of 100 hours of field/clinical experiences including at least one five-day experience.
3. A minimum overall accumulative grade point average of 2.00.
4. A minimum combined accumulative grade point average of 2.25 in the major field and professional education courses with no grade less than "C".
5. Completed the following courses with no grade less than "C": Education 100, Education 111 (Secondary and All-Grades, K-12), Education 223 (Elementary and All-Grades, K-12), Education 224, (Secondary and All-Grades, K-12), Education 250 (Elementary), Education 250 or 251 (Secondary and All-Grades, K-12), Education 281 (Elementary), English 108, 109, Speech 100, and Psychology 100.
6. Favorable recommendations from the following: departmental faculty advisor, major department chairperson, course instructor of Child or Adolescent Psychology (both if seeking All-Grades certification, K-12), faculty member from the major department or Education Department, any other faculty member, Residence Life, and Health Center.

Decisions on applications for admission to the program of Teacher Education are made by the Arts and Sciences Committee on Teacher Education.
AREAS OF CERTIFICATION
The following programs leading to a four-year provisional certificate are available.

1. ELEMENTARY EDUCATION
   a. Requirements for certification in the various elementary education areas may be obtained from the Office of the Director of Teacher Education.
   b. Professional education requirements are:
      
      education 100—education 3 hours
      education 223—child psychology 4 hours
      education 250—instructional media 3 hours
      education 260 or sociology 105 or 203 3 hours
      education 281—teaching in the elementary school 4 hours
      education 308—teaching mathematics 4 hours
      education 309—teaching science 4 hours
      education 310—children's literature 4 hours
      education 311—teaching social studies 4 hours
      education 312—teaching reading I 4 hours
      education 314—teaching reading II 4 hours
      education 470.01—student teaching 15 hours
      TOTAL 55 hours
   
   c. Dual—Elementary with Special Education
      EMR (Educable Mentally Retarded)
      MSPR (Moderately, Severely, Profoundly Retarded)
      LD/BD (Learning and/or Behavior Disabilities)
      For information on these cooperative programs currently offered with Bowling Green State University, see the Director of Teacher Education.
   
   d. Elementary Education with Kindergarten-Primary certification. Completion of elementary education program plus education 329, 330, 331—9 hours.
   
   e. Elementary Education with validations in:
      Art, visual for elementary grades
      Data Processing
      Driver Education
      French for elementary grades
      Music for elementary grades
      Physical Education for elementary grades
      Spanish for elementary grades
      See the Director of Teacher Education for specific program.
   
   f. Dual—Elementary Education with Teaching Field in Secondary Education. See Director of Teacher Education for specific program.

2. SECONDARY EDUCATION
   a. Requirements for certification in the various secondary teaching
fields may be obtained from the Office of the Director of Teacher Education.

b. Professional education requirements are:

- education 100—education 3 hours
- education 223—child psychology 4 hours
- education 111 secondary/all grades field experience 1 hour
- education 224—adolescent psychology 4 hours
- education 250—instructional media in education (3 hours)
  or
- education 251—instructional media lab (1 hour) 1-3 hours
- education 342—reading in the content area 4 hours
- education 370—social issues in the secondary schools 4 hours
- education 380—secondary curriculum 4 hours

methods course(s) in certification area from the following:

- education 450 (4 hours) 3-4 hours
- art 456 (3 hours)
- health 350 (3 hours)
- industrial technology 423 (3 hours)
- music 462 (3 hours)
- physical education 351 (3 hours)
- speech 370 (3 hours)
- education 480.02—student teaching 15 hours

TOTAL 39-42 hours

c. Secondary Certification programs are offered in the following areas:

- Art, Visual
- Biological Science
- Bookkeeping-Basic Business
- Chemistry
- Comprehensive Social studies
- Data Processing (Validation)
- Driver Education (Validation)
- Economics
- English
- General Science
- Health
- History
- Industrial Technology
- Languages: French, Spanish
- Mathematics
- Music
- Physical Education
- Physics
- Political Science
- Sales-Communication
- Social Psychology
- Sociology
- Speech
d. Secondary Certification with validation in:
   Data Processing
   Driver Education

e. Dual—Secondary with Special Education
   EMR—(Educable Mentally Retarded)
   MSPR (Moderately, Severely, Profoundly Retarded)
   LD/BD (Learning and/or Behavior Disabilities)
   For information on these cooperative programs currently offered
   with Bowling Green State University, see the Director of Teacher
   Education.

3. ALL GRADES (K-12) CERTIFICATION
   a. Requirements for certification in the various all grades areas may be
      obtained from the Office of the Director of Teacher Education.
   b. Professional education requirements are:
      
education 100—education 3 hours
      education 111 secondary/all grades field experience 1 hour
      education 223—child psychology 4 hours
      education 224—adolescent psychology 4 hours
      education 250—instructional media in education (3 hours)
      or
      education 251—instructional media lab (1 hour) 1-3 hours
      education 342—reading in the content area 4 hours
      education 370—social issues in the secondary schools 4 hours
      education 380—secondary curriculum 4 hours
      methods courses(s) in certification area from the following:
      education 450 (4 hours)
      art 457 (3 hours)
      health 350 (3 hours)
      industrial technology 423 (3 hours)
      music 461 and 462 3-6 hours
      physical education 351 (3 hours)
      education 470.01-480.01—student teaching 15 hours
      TOTAL 43-48 hours
   c. All Grades (K-12) Certification programs are offered in the following
      areas:
      Art, Visual
      French
      Health
      Industrial Arts
      Music
      Physical Education
      Spanish
   d. All Grades (K-12) Certification with validation in:
      Data Processing
      Driver Education
e. Dual—All Grades (K-12) with Special Education
   EMR (Educable Mentally Retarded)
   MSPR (Moderately, Severely, Profoundly Retarded)
   LD/BD (Learning and/or Behavior Disabilities)
   For information on these cooperative programs currently offered with Bowling Green State University, see the Director of Teacher Education.

4. COLLEGE STUDENT PERSONNEL

   The purpose of this program is to prepare the student to enter the field of college student personnel in universities, colleges, community colleges, junior colleges, and any other type of post-secondary educational institution. (This program also prepares the student to enter graduate school for additional preparation before entering the field on a full-time basis.) The College Student Personnel field covers many facets of the academic support and student personnel services including positions such as dean of men or dean of women; director of the student union; various positions in career counseling, placement, and admissions; also positions for personnel working in areas such as financial aid, housing, fraternities and sororities, student-operated businesses, and student government.

   A professional in college student personnel must be strong in the areas of interpersonal/intraperonal relationships and group dynamics; hence most of the professional preparation is in the fields of psychology, sociology, and education. Since such a large proportion of the professional course work is in the field of psychology, the student may also obtain a major in psychology with additional courses for the double major of College Student Personnel and Psychology.

   A major in College Student Personnel consists of the following requirements:
   1. Education 100
   2. Psychology 100
   3. Mathematics 142
   4. Psychology 111, 201
   5. Biology 100
   6. Mathematics 111, 232 or Biology 113, 231
   7. Speech 371
   8. Sociology 105, 240, 243, 246
   9. Education 224, 425, 426, 460, 463
   10. Psychology 212, 215, 301, 311, 411, 420, 424
   11. Education 487, (9-15 hours of internships/practica)

   To complete the major in Psychology, the student also needs:
   1. Psychology 202, 210
# GENERAL COURSES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.</td>
<td>EDUCATION</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Areas of competence essential for participation as a citizen in decision making for education: the changing role of the school, the learner and the learning process, school finance, values that give direction to education, current issues in education.</td>
<td></td>
</tr>
<tr>
<td>195.</td>
<td>ORIENTATION</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Familiarization with the department, requirements for majors, planning program of courses and clinical/field experiences, University catalog and library. Required of elementary education majors.</td>
<td></td>
</tr>
<tr>
<td>250.</td>
<td>INSTRUCTIONAL MEDIA IN EDUCATION</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Preparation, evaluation and selection of instructional material; effective utilization to facilitate learning. Includes lab for development of competence in operating audio-visual equipment and preparing instructional materials.</td>
<td></td>
</tr>
<tr>
<td>251.</td>
<td>INSTRUCTIONAL MEDIA LABORATORY</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Development of competence in operating audio-visual equipment and preparing instructional materials.</td>
<td></td>
</tr>
<tr>
<td>260.</td>
<td>SCHOOL AND SOCIETY</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Schools in relation to their supporting society; democracy in its relation to schools; the responsibility of educators to the community and to the school; the nature, type and limitations of both the official and unofficial controls of schools. Not open to students seeking secondary (7-12) or all grades (K-12) certification.</td>
<td></td>
</tr>
<tr>
<td>401.</td>
<td>HISTORY AND PHILOSOPHY OF EDUCATION</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Modern educational practice; historical changes in instructional processes and ideas; educational beliefs and points of view; the purpose of education in the United States democracy.</td>
<td></td>
</tr>
<tr>
<td>402.</td>
<td>SCHOOL ADMINISTRATION AND ORGANIZATION</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>The United States public school system, its organization and administrative units, and other agencies through which it is managed. The teacher's role in the organization of a school system.</td>
<td></td>
</tr>
<tr>
<td>420.</td>
<td>CURRICULUM IMPROVEMENT</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Individual and group problems growing out of students' own school situations.</td>
<td></td>
</tr>
<tr>
<td>433.</td>
<td>PHYSICAL GEOGRAPHY</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>A study and unification of the body of knowledge encompassing the earth sciences which give general insight into the nature of man's physical environment. (Formerly 132-433)</td>
<td></td>
</tr>
</tbody>
</table>
460. EVALUATION AND MEASUREMENT OF PUPIL PROGRESS 3 hours
Evaluation and measurement as they apply to instruction. Attention is given to instructor-made tests, standardized tests and basic statistics.

463. EDUCATIONAL PSYCHOLOGY 3 hours
The learner, the learning process, and conditions that promote learning. Application of psychological principles to teaching in the classroom. Prerequisite: Psychology 100.

465. COMPARATIVE EDUCATION 3 hours
The development of education systems in representative countries of the world. A comparison of purposes, programs and structures of education. The interaction of different cultures with their education systems. Prerequisite: education 100.

490. SPECIAL TOPICS IN EDUCATION 1-3 hours

497. INDEPENDENT STUDY IN EDUCATION 1-3 hours
In areas of student interest with permission of department chairman.

ELEMENTARY EDUCATION COURSES

200. CHILD DEVELOPMENT PRACTICUM 1 hour
Assignment as a regular assistant in the Child Development Center. Registration with permission of the department chairman.

223. CHILD PSYCHOLOGY 4 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. Includes clinical experience for teacher education students in the Child Development Center. Prerequisites: Students seeking certification, Psychology 100 and Education 100 with grades of "C" or better. Other students, Psychology 100.

281. TEACHING IN THE ELEMENTARY SCHOOL 3 hours
Concentration on the elementary school curriculum in relation to the initial development of teaching qualities across a broad spectrum rather than specific subject matter methods. Attention will be placed on commitment, sensitivity, resourcefulness, and organizational abilities; developing a personal philosophy toward teaching; and demonstrating competency in the basic teaching skills. Prerequisites: Psychology 100 and Education 100 with a grade of "C" or better.

308. TEACHING MATHEMATICS IN THE ELEMENTARY SCHOOL 4 hours
Content, strategies, materials, and evaluation that reflect the current emphasis in mathematics. Includes approximately 25 hours of supervised field experience. Prerequisites: 9 hours of college mathematics, admission to teacher education.
309. TEACHING SCIENCE IN THE ELEMENTARY SCHOOL 4 hours
The role of science in childhood education, the preparation of materials, and organization of learning activities for problem solving. Includes approximately 25 hours of supervised field experience. Prerequisites: 10 hours of college science, admission to teacher education.

310. CHILDREN'S LITERATURE 4 hours
Knowledge and appreciation of children's books and teaching of creative writing skills. Emphasis will be placed on the study of all areas of literature for children including realism, fantasy, folk literature, poetry, biography, and informational books. Includes approximately 25 hours of supervised field experience. Prerequisites: English 200 and 351, admission to teacher education.

311. TEACHING SOCIAL STUDIES IN THE ELEMENTARY SCHOOL 4 hours
Objectives, trends, issues and evaluation of the teaching of social studies, relative to the concepts and principles underlying the disciplines of the social sciences. Includes approximately 25 hours of supervised field experience. Prerequisites: 15 hours of college social sciences, admission to teacher education.

312. TEACHING READING I 4 hours
Introduction to reading. Emphasis will be placed on phonics, word attack skills, and communication skills including listening, speaking, spelling, grammar and usage. Includes approximately 25 hours of supervised field experience. Prerequisite: Admission to teacher education.

314. TEACHING READING II 4 hours
Principles and methods of teaching reading, including comprehension skills, diagnostic skills, and preparation and evaluation of reading materials. Includes approximately 25 hours of supervised field experience. Prerequisites: Education 312, admission to teacher education.

329. PRINCIPLES OF KINDERGARTEN EDUCATION 2 hours
History, philosophy and current development of kindergarten education as a part of early childhood education. Introduction to field of early childhood education. Prerequisite: Education 223.

330. METHODS AND MATERIALS IN KINDERGARTEN 3 hours
Curriculum planning and organization, teaching processes, development of materials. Observation and field experiences. Prerequisite: Education 329.

331. PRACTICUM IN KINDERGARTEN EDUCATION 4 hours
Supervised field experience on a sequential basis. Includes seminars. Prerequisite: Education 330.
410. INTRODUCTION TO SPECIAL EDUCATION 3 hours
Developmental growth and learning characteristics; etiology; diagnosis and differentiation; teacher and learner problems in education. Includes approximately 20 hours of field experience. Prerequisite: admission to teacher education or permission of instructor.

411. LANGUAGE ARTS IN SPECIAL EDUCATION 3 hours
Methods, materials for functional communication skills. Prerequisites: Education 410, admission to teacher education or permission of instructor.

412. MATHEMATICS AND SCIENCE IN SPECIAL EDUCATION 3 hours
Methods, materials for basic mathematics and science concepts; practical application. Prerequisites: Education 410, admission to teacher education or permission of instructor.

415. EDUCATION OF CHILDREN WITH LEARNING DISABILITIES (LD) 3 hours
Ways to promote learning with atypical children from mental, social and physical standpoints. Emphasis on children with classroom associated difficulties. Introductory for area. Includes approximately 20 hours of field experience. Prerequisites: Education 410, admission to teacher education or permission of instructor.

417. SPECIAL EDUCATION PROGRAM - BOWLING GREEN STATE UNIVERSITY 18 hours
Courses provided by arrangement with Bowling Green State University, Fall Quarter.

418. SPECIAL EDUCATION PROGRAM - BOWLING GREEN STATE UNIVERSITY 18 hours
Courses provided by arrangement with Bowling Green State University, Winter Quarter.

419. SPECIAL EDUCATION PROGRAM - BOWLING GREEN STATE UNIVERSITY 18 hours
Courses provided by arrangement with Bowling Green State University, Spring Quarter.

441. ADVANCED READING METHODS AND MATERIALS 3 hours
Advanced study of the reading process, comprehension and speed skills; prevention and treatment of individual problems. Prerequisite: Education 314.

470. STUDENT TEACHING IN THE ELEMENTARY SCHOOL 7-15 hours
Planning and teaching under supervision in the elementary grades; weekly seminar on campus. Prerequisites: An overall accumulative point average of at least 2.00; an accumulative point average of at least 2.25 in the elementary education major courses (with no grade less than "C"); a minimum of 300 hours of supervised clinical and field experiences; recommendation of the professional adviser of the student; and approval by the Director of Teacher
Education. Students seeking all grades (K-12) or special education certification enroll for 7 hours. Students seeking elementary (K-8 or 1-8) certification enroll for 15 hours.

472. STUDENT TEACHING- SPECIAL EDUCATION 8 hours
Teaching under supervision in special education classrooms, elementary grades, with weekly seminars. Prerequisites: An accumulative point average of at least 2.00; an accumulative point average of at least 2.25 in the elementary education major and special education courses (with no grade less than "C"); a minimum of 300 hours of supervised clinical and field experiences; completion of Education 223, 410, 415, Psychology 218, courses in special education at Bowling Green State University; recommendation of the professional adviser of the student; and approval by the Director of Teacher Education.

SECONDARY EDUCATION COURSES

111. SECONDARY/ALL GRADES FIELD EXPERIENCE 1 hour
Observation and participation with students and teachers in schools. Seminars and conferences with University supervisor. Includes approximately 25 hours of supervised field experiences. Students seeking teacher certification in secondary education or all grades (Art, Music, Health, Physical Education, Industrial Technology) should complete the course during their freshman year.

224. ADOLESCENT PSYCHOLOGY 4 hours
The adolescent's physical, social, emotional, and intellectual development; in accordance with genetic constitution and environmental forces from birth. Includes approximately 25 hours of supervised clinical/field experiences. Prerequisite: students seeking certification, Psychology 100 and Education 100 with grades of "C" or better; other students, Psychology 100.

342. READING IN THE CONTENT AREA: 4 hours
SECONDARY EDUCATION
Strategies for teaching developmental reading skills in a variety of curricular areas. Emphasis on the following aspects of reading: study skills, individualization, diagnosis, vocabulary, comprehension and evaluation. Includes approximately 25 hours of supervised field experience. Prerequisite: admission to teacher education.

370. SOCIAL ISSUES AND THE SECONDARY SCHOOL (Formerly SCHOOL AND SOCIETY). 4 hours
A sociologically oriented course analyzing the institution of education, focusing on the interrelation of schools to other institutions in society. Special emphasis on responsibilities and characteristics of teachers, students, and school administrators. Includes approximately 25 hours of supervised field experiences in an urban secondary school. Prerequisite: admission to teacher education.
375. SCHOOL, SOCIETY AND THE SECONDARY CURRICULUM
6 hours
The interrelation of society, school, and the secondary curriculum; class and laboratory experiences provided in area schools. Schools in relation to their supporting society; democracy in its relation to schools; responsibilities of educators to the community; nature, type and limitations of official and unofficial controls. Secondary school curriculum standards, practices, instructional materials, curriculum development, functions and trends. Prerequisite: admission to teacher education.

380. THE SECONDARY SCHOOL CURRICULUM
4 hours
Secondary school curriculum standards, practices, instructional materials, curriculum development, functions, changes and trends. Includes approximately 25 hours of supervised field experiences. Prerequisite: admission to teacher education.

450. TEACHING METHODS IN THE SECONDARY SCHOOL
4 hours
Methods, devices and techniques which are most effective in directing learning in the various subject areas at the high school level; observations and participation in actual classroom situations. Prerequisite: admission to teacher education.

480. STUDENT TEACHING-JUNIOR AND SENIOR HIGH SCHOOL
8-15 hours
Planning and teaching under supervision in the junior or senior high school, full time, five days per week, in the major teaching field of the student; weekly seminar on campus. Prerequisites: An overall accumulative point average of at least 2.00; an accumulative point average of at least 2.25 in the major of the student and in the professional education courses (with no grade less than "C"); with a minimum of 300 hours of supervised clinical and field experiences; recommendations of the major adviser and of the professional education adviser of the student; and approval by the Director of Teacher Education. Students seeking all grades (K-12) or special education certification enroll for 8 hours. Students seeking secondary (7-12) certification enroll for 15 hours.

482. STUDENT TEACHING-SPECIAL EDUCATION, SECONDARY, BGSU
8 hours
Teaching under supervision in special education classrooms, secondary grades, with weekly seminars. Prerequisites: An accumulative point average of at least 2.00; an accumulative point average of at least 2.25 in the major courses, the Professional education courses, and the special education courses (with no grade less than "C"); a minimum of 300 hours of supervised clinical and field experiences; completion of education 223 (if all grades), 224,410,415, psychology 218, courses in special education at Bowling Green State University; recommendation of the major adviser and of the professional education adviser of the student; and approval by the Director of Teacher Education.
COLLEGE STUDENT PERSONNEL COURSES

425. ORGANIZATION AND ADMINISTRATION OF HIGHER EDUCATION
3 hours
A survey of post-secondary institutions of education in the United States. Covers universities, colleges, community colleges, junior colleges, technical institutes and other forms of higher education. Deals with all aspects of operation including academic, financial, student personnel and institutional governance. Prerequisite: Approval of instructor.

426. ORGANIZATION AND ADMINISTRATION OF COLLEGE STUDENT PERSONNEL
3 hours
Involves the study of many diverse areas involved in college student personnel including orientation, student government, residence halls, counseling and career counseling, placement, admissions, financial aid and student unions. Prerequisite: approval of the instructor.

487. INTERNSHIPS/PRACTICA IN COLLEGE STUDENT PERSONNEL
1-6 hours
Field experience in the various areas of college student personnel. Prerequisite: approval of the instructor. May be repeated for a maximum of 15 hours.

ENGLISH
(Department 112)

Professors Beck (Chairman), C. Dornbusch, Oliver, Price, R. Robinson; Associate Professors Banks, Magee, E. Miller; Assistant Professor Shafer (On leave 81-82); Instructor Ward; Lecturer M. DeVore.

OBJECTIVES
The courses in English are designed to help students demonstrate an awareness of style together with an ability to express themselves maturely, clearly, concisely; understand generally the symbolic process of language and particularly the structure and usage of the English language; read critically as a means of gathering, understanding, evaluating, and enjoying recorded human experience; comprehend the growth and continuity of Western ideas and become acquainted with the humanizing qualities of the Western World through the study of literature; analyze a piece of literature by applying some of the techniques of the specialist; understand and respect the techniques of research and the accomplishments of scholarship in the discipline of English; recognize the relationship of language and literature to other areas of knowledge; and develop the ability to apply language skill in other academic disciplines as well as later careers.

Advanced courses increasing the breadth and depth of the objectives listed above are offered as humanities electives and as part of the curriculum for majors.

Three majors—ENGLISH (as a first or second major), ENGLISH WITH A CONCENTRATION IN WRITING (as a first or second major), and WRITING
(as a second major only) are offered. Two minors—LITERATURE and WRITING—are also offered. The programs are designed to help students apply a sound background in reading and writing to the requirements of journalism, communications, law, teaching, and other careers.

Teacher certification can be earned in English, journalism, and communications (a combination of English, speech and theatre, journalism, and reading).

For a 45-hour MAJOR in ENGLISH, the following courses are required: 201, 202, 203; 211, 212; 381; 311 or 312; 351-352; 410; 489; 494 or 495; and three free electives in English (journalism activities may not be counted).

Also required are three courses in English history and either (1) intermediate foreign language at the college level or (2) three courses in philosophy excluding Philosophy 100. The student is however, strongly urged to take both the intermediate language and the three courses in philosophy.

For a 45-hour MAJOR in ENGLISH WITH A CONCENTRATION IN WRITING, the following credit-hour and course distribution is required: 6 hours—The English Language (351-352), 15 hours—journalism and advanced writing with 489 The Senior Essay required, 3 hours—Journalism Activities—Newspaper (250), 21 hours—literature electives (distributed by period and type).

For a 45-hour MAJOR in WRITING, the following credit-hour and course distribution is required: 3 hours—Writing Orientation (198), 1 hour per quarter; 9 hours—Writing 1, 2, 3 (107-108-109); 3-6 hours—Journalism Activities with at least 3 hours in Newspaper (250); 12-18 hours—journalism and advanced writing (chosen from 241, 243, 341, 342, 343, 344, 356 and special-topics courses in writing); and 12-15 hours—Directed Study in Writing (498).

For a 30-hour MINOR in LITERATURE, the following courses are required: 201, 202, 203; 211, 212; 311 or 312; 351-352; advanced writing—6 hours (excluding Journalism Activities). Two approved literature courses (excluding Special Topics) may be substituted for one of the three English literature survey courses and for one of the two American literature survey courses.

For a 30-hour MINOR in WRITING, the following credit-hour and course distribution is required: 6 hours—The English Language (351-352); 12 hours—advanced writing, including up to 3 hours of Journalism Activities—Newspaper (250); and 12 hours—literature electives (distributed by period and type).

All majors are required to earn credit (1 hour) in the Proseminar in English (195), which counts as the Arts and Sciences College orientation.

English 107, 108, 109 do not count toward any major or minor in the Department of English, nor does any course with a grade below "C".

The three freshman English courses 107-108-109 are sequential and accumulative and must be taken one at a time in numerical order.
107. WRITING 1 3 hours
Beginning writing in exposition and argumentation, with readings in poetry; documentation introduced. English 107 is a prerequisite for all 200 level literature courses.

108. WRITING 2 3 hours
Intermediate writing in exposition and argumentation, with readings in drama; documentation continued. Prerequisite: English 107.

109. WRITING 3 3 hours
More advanced writing in exposition and argumentation, with readings in fiction; library research and documented paper. Prerequisite: English 108. 3 hours English 107, 108, and 109 are prerequisites for all 300 and 400 level English courses.

151. ENGLISH AS A SECOND LANGUAGE 3 hours
Communication skills for non-native speakers of English—speaking, reading, writing in a cultural context. Placement into and out of the three courses by examination.

152. ENGLISH AS A SECOND LANGUAGE 3 hours
Continuation of 151.

153. ENGLISH AS A SECOND LANGUAGE 3 hours
Continuation of 152.

180. INTRODUCTION TO WRITING 1 hour
The purpose of the course is to give the student's writing as much personal attention as possible in the freshman year; to prepare and get used to writing independently; to help formulate and carry through on individual writing projects.

195. PROSEMINAR IN ENGLISH 1 hour
Orientation to the College of Arts and Sciences and to the Department of English. Required of all freshmen and transfer majors in the fall quarter. Counts as Arts and Sciences orientation requirement.

200. PROBLEMS IN CRITICISM 3 hours
Definitions of arts, literature, and genres; the language of critical statements; concepts of taste; literature in critical perspectives.

201. ENGLISH LITERATURE TO 1660 3 hours
A survey of Anglo-Saxon, Medieval, and Renaissance literature.

202. ENGLISH LITERATURE 1660-1830 3 hours
A survey of Restoration, Neo-Classical, and Romantic literature.

203. ENGLISH LITERATURE AFTER 1830 3 hours
A survey of Victorian and Modern literature.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>211</td>
<td>AMERICAN LITERATURE TO 1865</td>
<td>3 hours</td>
</tr>
<tr>
<td></td>
<td>A survey of Colonial and Romantic literature.</td>
<td></td>
</tr>
<tr>
<td>212</td>
<td>AMERICAN LITERATURE AFTER 1865</td>
<td>3 hours</td>
</tr>
<tr>
<td></td>
<td>A survey of Modern literature.</td>
<td></td>
</tr>
<tr>
<td>221</td>
<td>WORLD LITERATURE 1</td>
<td>3 hours</td>
</tr>
<tr>
<td></td>
<td>Major literary masterpieces of the ancient and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>medieval periods.</td>
<td></td>
</tr>
<tr>
<td>222</td>
<td>WORLD LITERATURE 2</td>
<td>3 hours</td>
</tr>
<tr>
<td></td>
<td>Major literary masterpieces from the Renaissance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>to the mid-nineteenth century.</td>
<td></td>
</tr>
<tr>
<td>223</td>
<td>WORLD LITERATURE 3</td>
<td>3 hours</td>
</tr>
<tr>
<td></td>
<td>Major literary masterpieces from the mid-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>nineteenth century to the present.</td>
<td></td>
</tr>
<tr>
<td>241</td>
<td>NEWSWRITING 1</td>
<td>3 hours</td>
</tr>
<tr>
<td></td>
<td>The fundamentals of gathering information and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>writing for a newspaper.</td>
<td></td>
</tr>
<tr>
<td>242</td>
<td>NEWSWRITING 2</td>
<td>3 hours</td>
</tr>
<tr>
<td></td>
<td>Further work in newswriting, with an emphasis on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>special forms, such as feature writing. Pr</td>
<td></td>
</tr>
<tr>
<td></td>
<td>requisites: English 241.</td>
<td></td>
</tr>
<tr>
<td>243</td>
<td>MAGAZINE WRITING</td>
<td>3 hours</td>
</tr>
<tr>
<td></td>
<td>The discipline and technique of writing articles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>for magazines.</td>
<td></td>
</tr>
<tr>
<td>244</td>
<td>PRESS FREEDOM-LAW</td>
<td>3 hours</td>
</tr>
<tr>
<td></td>
<td>A survey of press freedom and law in the United</td>
<td></td>
</tr>
<tr>
<td></td>
<td>States, including recent developments within the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>collegiate press.</td>
<td></td>
</tr>
<tr>
<td>246</td>
<td>JOURNALISM LAYOUT AND DESIGN</td>
<td>3 hours</td>
</tr>
<tr>
<td></td>
<td>The theory and technique of layout and design of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>newspapers and magazines.</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>JOURNALISM ACTIVITIES-NEWSPAPER</td>
<td>1 hour</td>
</tr>
<tr>
<td>251</td>
<td>JOURNALISM ACTIVITIES-MAGAZINE</td>
<td>1 hour</td>
</tr>
<tr>
<td>252</td>
<td>JOURNALISM ACTIVITIES-YEARBOOK</td>
<td>1 hour</td>
</tr>
<tr>
<td>253</td>
<td>JOURNALISM ACTIVITIES—INTERNSHIP</td>
<td>1 hour</td>
</tr>
<tr>
<td></td>
<td>Supervised work on and contributions to the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>publications. The student may enroll for only</td>
<td></td>
</tr>
<tr>
<td></td>
<td>one activities course per quarter. Six hours in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>one area or a combination of six hours from the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>four areas (250, 251, 252, 253) may be counted</td>
<td></td>
</tr>
<tr>
<td></td>
<td>toward graduation, but only the required three</td>
<td></td>
</tr>
<tr>
<td></td>
<td>credit hours of Journalism Activities—Newspaper</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(250) may be counted toward a major in English</td>
<td></td>
</tr>
<tr>
<td></td>
<td>with a concentration in writing or toward a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>minor in writing. Journalism activities do NOT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>count toward a major in English or toward a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>minor in literature. No prerequisites.</td>
<td></td>
</tr>
<tr>
<td>290</td>
<td>SPECIAL TOPICS IN ENGLISH</td>
<td>1-3 hours</td>
</tr>
<tr>
<td>291</td>
<td>SPECIAL TOPICS IN WORLD LITERATURE</td>
<td>1-3 hours</td>
</tr>
</tbody>
</table>
292. SPECIAL TOPICS IN ENGLISH LITERATURE 1-3 hours

293. SPECIAL TOPICS IN AMERICAN LITERATURE 1-3 hours

297. INDEPENDENT STUDY IN ENGLISH 1-3 hours

310. ENGLISH LITERATURE BEFORE 1500 3 hours
Continuity in Anglo-Saxon attitudes and types from Boewulf to Chaucer. Epic, lyric, elegy, narrative with emphasis on medieval romance and drama, all in translation.

311. SHAKESPEARE 3 hours
Representative plays and poems.

312. SHAKESPEARE 3 hours
Continuation of 311.

314. ENGLISH RENAISSANCE 3 hours
A concentrated study of two or three major writers or of a single genre in the Elizabethan and Jacobean periods.

321. MILTON 3 hours
Milton's major lyric poems, "Paradise Lost" and "Samson Agonistes."

322. RESTORATION AND THE EIGHTEENTH CENTURY 3 hours
A concentrated study of two or three major writers, movements, or genres in the Neo-Classic period.

323. ENGLISH ROMANTICISM 3 hours
A concentrated study of two or three major writers.

324. VICTORIAN PERIOD 3 hours
A concentrated study of two or three major writers, movements, or genres.

325. MODERN POETERY 3 hours
A survey of modern English and American poets with emphasis on one or two major figures such as Yeats and Frost.

326. TWENTIETH-CENTURY BRITISH LITERATURE 3 hours
A concentrated study of two or three major writers, movements, or genres.

333. MODERN WORLD DRAMA 3 hours
The study of modern drama, concentrating on major works and playwrights, including influences, movements, and types.

334. MAJOR AMERICAN WRITERS OF THE NINETEENTH CENTURY 3 hours
Concentrated studies of selected nineteenth-century writers.
335. MAJOR AMERICAN WRITERS OF THE TWENTIETH CENTURY 3 hours
Concentrated studies of selected twentieth-century writers.

341. POETRY WRITING 3 hours
The discipline and technique of writing poetry. Prerequisite: a literature course above the freshman level. Graded S-U. May be continued as 498 (independent study in writing).

342. FICTION WRITING 3 hours
The discipline and technique of writing fiction. Prerequisite: a literature course above the freshman level. Graded S-U. May be continued as 498 (independent study in writing).

343. FACTUAL WRITING 3 hours
The theory, method, and practice of writing non-fictional prose, with particular emphasis on the development of effective style. Prerequisite: a literature course above the freshman level. Graded S-U. May be continued as 498 (independent study in writing).

344. WRITING FROM EVIDENCE 3 hours
Use of primary sources-diaries, letters, stories, reports-as bases for thinking and writing: analysis, interpretation, synthesis, evaluation.

346. PRELAW WRITING 3 hours
Clear analysis and direct communication of facts and ideas according to the mode of legal writing. Graded S-U.

351. THE ENGLISH LANGUAGE 3 hours
The historical development of the English language and an introduction to modern linguistics.

352. THE ENGLISH LANGUAGE 3 hours
Continuation of 351.

364. THE ENGLISH NOVEL 3 hours
Representative novels from the eighteenth century to the present.

365. THE AMERICAN NOVEL 3 hours
Representative novels from the nineteenth century to the present.

381. HISTORY OF LITERARY CRITICISM 3 hours
Movements and major writers of literary criticism.

410. CHAUCER 3 hours
A study of Chaucer with special emphasis on The Canterbury Tales, some reading of the chief literary forms of the Middle Ages, some skill in understanding and reading Middle English.
489. THE SENIOR ESSAY  3 hours
Required of all English majors during the senior year. The student will enroll in the quarter during which he expects to complete the essay.

490. SPECIAL TOPICS IN ENGLISH  1-3 hours

494. SEMINAR IN ENGLISH LITERATURE  3-6 hours

495. SEMINAR IN AMERICAN LITERATURE  3-6 hours

497. INDEPENDENT STUDY IN LITERATURE  1-3 hours

498. INDEPENDENT STUDY IN WRITING  1-3 hours
Graded S-U.

499. INDEPENDENT STUDY IN JOURNALISM  1-3 hours

FOREIGN LANGUAGES
(Department 113)

Professor Lippert (Chairwoman); Associate Professors Davey, Day, Khoury; Instructor Weber.

The foreign language program is designed to train students to speak, understand, read, and write a foreign language; to insure a strong background in the literature and culture of peoples whose language they are studying; to provide the language ability necessary for students to work in a number of fields; to prepare students for graduate work; to train students to be teachers of foreign languages at the elementary and secondary levels. See departmental brochure for descriptions of career opportunities.

The University Audio Center provides the student with opportunities for language practice and extends his/her contact with the living language. Recorded materials used in the center are prepared as an adjunct to class work and are coordinated with class instruction. Additional materials are also available which give the student ample opportunity for aural comprehension, auditory-visual drill, speaking, and self-correction.

Requirements for a major in French or Spanish: 45 hours are required above the 100-level courses, to include 327, 328, 329 (French) or 353, 354, 355 (Spanish). Students develop individual programs of study with advisers. Ordinarily courses are taken in sequence through the conversation and composition courses.

It is strongly recommended, although not required, that language majors take part in summer-study-abroad or junior-year-abroad programs. Faculty advisers assist students in developing these programs of study. Language majors are also encouraged to develop a second academic area of interest in addition to their language major.

Requirements for a minor in French or German or Spanish: 30 hours are required above the 100-level courses. Individual programs are devised for students, but emphasis is on language and civilization.
Individualized study in certain less-frequently-taught languages is provided under the auspices of the Audio Center. Students pursue taped courses in those languages elected, with the aid of native tutors. Professors of those languages at neighboring universities test and grade the students.

000. ORIENTATION
1 hour
Familiarization with the department, requirements for majors, planning program of courses, university catalog, library, career and employment opportunities, foreign study opportunities, certification requirements; required of majors in the department.

403. SPECIAL TOPICS IN LITERATURE IN TRANSLATION
3 hours
One-quarter course in either Spanish, French or German literature in translation. Focus on major writers and literary trends of different periods. Lectures and assignments in English. Does not fulfill the General Education or in-depth requirements in Foreign Language. Fulfills indepth requirements in literature.

FRENCH

100. ELEMENTARY FRENCH
4 hours
To develop the ability to understand, speak, read and write French; functional grammar, early and fluent speaking; elementary reading based on French life, customs, and manners. Four class periods and two hours of scheduled laboratory practice per week.

101. ELEMENTARY FRENCH
4 hours
Continuation of 100.

210. BUSINESS FRENCH
3 hours

214. INTERMEDIATE FRENCH 1
4 hours
The completion of basic French grammar begun in Elementary French 1 and 2. Conversational practice and composition based on reading passages, films in the "Toute la Bande" series and popular music. Four class periods and two hours of scheduled laboratory practice per week. Prerequisite: 101 or proficiency established by placement examination.

215. INTERMEDIATE FRENCH 2
4 hours
Continuation of 214.

217. FRENCH PHONETICS
3 hours
A basic introduction to linguistic terminology and a comparative analysis of the French and English sound systems, with emphasis on improving students' pronunciation in French. Open to all students.
219. INTRODUCTION TO FRENCH LITERATURE  3 hours
An intermediate level course intended as an introduction to serious reading in French. Class discussion, in French, based on selections of short literary masterpieces (classic and modern).

290. SPECIAL TOPICS IN FRENCH  1-3 hours

297. INDEPENDENT STUDY IN FRENCH  1-3 hours
Students may request a one-credit-hour grammar review course under this heading. Individualized instruction with work in the language lab.

311. FRENCH CONVERSATION AND COMPOSITION  3 hours
To develop oral and written command of the language. A study of grammatical and phonetic problems aimed at perfecting clarity and accuracy of expression. Audio-visual materials, current periodicals and realia are used. Occasional laboratory practice. Prerequisite: 215 or permission of the department.

312. ADVANCED FRENCH LANGUAGE STUDY  3 hours
An intensive study of grammar and syntax with emphasis on constructions of high-frequency usage. Written compositions and oral practice. Prerequisite: 311 or permission of the department.

313. INTRODUCTION TO LITERARY ANALYSIS  3 hours
Critical principles in the assessment of prose fiction, poetry and drama. Written compositions based on selected readings in francophone literature. Prerequisite: 312 or permission of the department.

314. THE FRENCH TEXT: THE SHORT STORY  3 hours
Reading of short fiction by classic and contemporary authors. Selections progress according to difficulty.

315. THE FRENCH TEXT: THE NOVEL  3 hours
Reading of contemporary and classical novels, primarily for fluency of comprehension. Study of the genre's development in French literature.

316. THE FRENCH TEXT: THE ESSAY AND NON-LITERARY TEXTS  3 hours
Study of selected essays from the work of Montaigne, Pascal, Rousseau, Camus, Sartre and others. Survey of the French press. Reading in Le Monde, l'Express, other periodicals and non-literary works.

319. FRENCH POETRY AND SONG  2 hours
Rules of French versification. Study of selected works of major poets from the Middle Ages to the twentieth century. Modern interpretations of poetry into song by Brassens, Ferrat, Moustaki and others.

327. CIVILISATION FRANCAISE: LA VIE CONTEMPORAINE  3 hours
Introduction to contemporary French culture, an interdisciplinary approach. Includes such topics as class, the family, leisure activities, attitudes, communication, role of the arts, political parties, education.
328. CIVILISATION FRANCAISE: L'HISTOIRE DE LA FRANCE 3 hours
A survey of the history, geography, political institutions of France.

329. CIVILISATION FRANCAISE: LES CULTURES FRANCOPHONES 3 hours
A survey of francophone cultures in the world. Emphasis on Africa and the Antilles.

415. ADVANCED FRENCH GRAMMAR 3 hours
Intense study of French grammar. Comparative French and English grammar, with frequent translation exercises.

416. THE FRENCH THEATRE 3 hours
Historic study of the genre through selection of plays of the 17th, 18th, 19th, and 20th centuries. Course includes listening to productions, or when possible, viewing productions or films.

418. FRANCOPHONE LITERATURE OF THE TWENTIETH CENTURY 3 hours
Study of contemporary writers representing literary movements and tendencies in the French-speaking world.

490. SPECIAL TOPICS IN FRENCH 1-3 hours

497. INDEPENDENT STUDY IN FRENCH 1-3 hours

GERMAN

102. ELEMENTARY GERMAN 1 4 hours
To develop the ability to understand, speak, read, and write German; functional grammar; early and fluent speaking; elementary reading based on German life, customs, and manners. Four class periods and two hours of scheduled laboratory practice per week.

220. BUSINESS GERMAN 3 hours
A survey of German business practice including office procedure and advertisements. Students develop writing and conversational skills related to business. Some translation. Prerequisite: 102-103.

224. INTERMEDIATE GERMAN 1 4 hours
Review of the fundamentals of grammar, pronunciation, vocabulary, and idioms; conversational practice and composition; readings and discussion about German life and culture; occasional viewing of slides, films, and newsreels. Four class periods and two hours of scheduled laboratory practice per week. Prerequisite: 103 or proficiency established by placement examination.
225. INTERMEDIATE GERMAN 2 4 hours
Continuation of 224.

261. INTRODUCTION TO GERMAN LITERATURE 3 hours
Reading and discussion of well-known poetry, plays, and short prose selections, from classic to contemporary. Presentations, in German, to focus on genre, the work as representative of literary movements, and the reflection of society and social change in literature.

291. SPECIAL TOPICS IN GERMAN 1-3 hours

298. INDEPENDENT STUDY IN GERMAN 1-3 hours

321. GERMAN CONVERSATION AND COMPOSITION 3 hours
To develop a useful command of the German language and appreciation of German civilization. Material and topics chosen to encourage and facilitate speaking and writing ability. Occasional laboratory practice. An advanced study of grammatical and phonetic problems aimed at perfecting clarity and accuracy of expression. Prerequisites: German 224, 225 or proficiency established by placement examination.

322. GERMAN CONVERSATION AND COMPOSITION 3 hours
Continuation of 321.

323. GERMAN CONVERSATION AND COMPOSITION 3 hours
Continuation of 322.

337. THE GERMAN-SPEAKING WORLD
A survey of history, culture, social and political institutions in the German-speaking countries. Outside reading and written reports on assigned topics. Lectures in German. Prerequisite: German 225 or permission of the instructor.

491. SPECIAL TOPICS IN GERMAN 1-3 hours

498. INDEPENDENT STUDY IN GERMAN 1-3 hours

SPANISH

104. ELEMENTARY SPANISH 1 4 hours
To develop the ability to understand, speak, read and write Spanish; functional grammar; early speaking; elementary reading based on Hispanic life, customs, and manners, using materials dealing with Spain, Mexico, and South America. Four class periods and two scheduled laboratory practices per week.

105. ELEMENTARY SPANISH 4 hours
Continuation of 104. 4 hours

240. BUSINESS SPANISH 3 hours
A survey of Spanish business practice including office procedure and advertisements. Students develop writing and conversational skills related to business. Some translation. Prerequisite: 244, 245.
244. INTERMEDIATE SPANISH 1  3 hours
A review of grammar and pronunciation; conversational practice and occasional lectures in Spanish on Hispanic life, history, art and civilization, illustrated with slides, photographs, reproductions, and realia. Four class periods and two hours of scheduled laboratory practice per week. Prerequisite: Spanish 105 or proficiency established by placement examination.

245. INTERMEDIATE SPANISH 2  4 hours
Continuation of 244.

248. SPANISH PHONETICS  3 hours
A basic introduction to linguistic terminology and a comparative analysis of the Spanish and English sound systems, with emphasis on improving students' pronunciation in Spanish. Open to all students. Prerequisites: Spanish 104 and 105.

292. SPECIAL TOPICS IN SPANISH  1-3 hours

299. INDEPENDENT STUDY IN SPANISH  1-3 hours

341. SPANISH CONVERSATION AND COMPOSITION  3 hours
To develop a useful command of the language; current periodicals and realia; audio visual materials. A study of grammatical and phonetic problems aimed at perfecting clarity and accuracy of expression. Occasional laboratory practice. Prerequisite: 245 or permission of the department.

342. ADVANCED SPANISH LANGUAGE STUDY  3 hours
An intensive study of grammar and syntax with emphasis on constructions of high-frequency usage. Written compositions and oral practice. Prerequisite: 341 or permission of the department.

343. INTRODUCTION TO LITERARY ANALYSIS  3 hours
Critical principles in the assessment of prose, fiction, poetry, and drama. Written compositions based on selected readings in Hispanic literature. Prerequisites: 342 or permission of the department.

349. SPANISH-LANGUAGE THEATER PRODUCTION  1-3 hours
Up to three hours of credit, depending on role. May be repeated for graduation credit up to a maximum of six hours. Permission of instructor required. ( Formerly 113-249 )

351. HISPANIC CULTURAL PERSPECTIVES  3 hours
A study of how Spaniards and Spanish Americans view the world, in contrast to typical American perspectives. Emphasis on the various social concepts, attitudes, orientations, and life styles which make up different and sometimes unique points of view. Counts for the Spanish major or minor, but is not a substitute for General Education or In-depth courses. Permission of instructor required.
353. CIVILIZACION HISPANICA I 3 hours
Integrates the geographical, political, economic, social, and cultural forces which have molded Spain from prehistoric times to the nineteenth century. Outside reading and written reports on assigned topics. Required for all Spanish majors. Prerequisites: Spanish 341, 342, and 343.

354. CIVILIZACION HISPANICA II 3 hours
A general survey of the geography, history, and cultural forces of Latin America up to the nineteenth century, with special attention to the pre-Colombian indigenous culture of Mexico, Central and South America. Reference to architecture, sculpture, ceramics and other art forms. Outside reading and written reports on assigned topics. Required for all Spanish majors. Prerequisites: Spanish 341, 342, 343.

355. CIVILIZACION HISPANICA III 3 hours
A general survey of contemporary Spain and Latin America. Political, economic, social and cultural evolution. Artistic and literary creation. Modern Spanish thought. Outside reading and written reports on assigned topics. Required for all Spanish majors. Prerequisite: Spanish 341, 342, 343.

448. HISTORY OF SPANISH ART 3 hours
Students follow the development in Spanish art from primitive times to the present day: Visigoth, Romanesque, Gothic, and Moslem art; art in Spain under the Catholic Kings; Renaissance architecture, 16th century painting and sculpture; El Greco, Baroque art, Impressionism, Picasso, contemporary painting, architecture and sculpture.

449. CONTEMPORARY SPANISH-AMERICAN NOVEL 3 hours
Study and analysis of selected twentieth century Spanish-American novels.

451. SPANISH LITERATURE TO 1681 3 hours
A study of the chief authors of Spain from the beginnings up to and including the Golden Age.

452. EIGHTEENTH AND NINETEENTH CENTURY SPANISH LITERATURE 3 hours
Neoclassicism, romanticism, realism, generation of 1898.

453. TWENTIETH-CENTURY SPANISH LITERATURE 3 hours
Main currents of Spanish literature from the generation of 1898 to the present.

456. NINETEENTH-CENTURY SPANISH-AMERICAN LITERATURE 3 hours
Romanticism (including Gaucho Literature), Realism, Modernism.

457. TWENTIETH-CENTURY SPANISH-AMERICAN LITERATURE 3 hours
The main currents from the Post-Modernist period to the present.

492. SPECIAL TOPICS IN SPANISH 1-3 hours
496. SEMINAR IN SPANISH 1-3 hours

499. INDEPENDENT STUDY IN SPANISH 1-3 hours

INDIVIDUALIZED STUDY COURSE

111. ELEMENTARY ITALIAN 1 4 hours
Self-instruction, including use of tapes and native language tutors; designed to develop fluency in spoken Italian. Prerequisite: Permission of the chairwoman. Offered alternate years.

112. ELEMENTARY ITALIAN 2 4 hours
Continuation of 111.

113. ELEMENTARY ARABIC 1 4 hours
Self-instruction, including use of tapes and native language tutors; designed to develop fluency in spoken Arabic. Prerequisite: Permission of chairwoman. Offered alternate years.

114. ELEMENTARY ARABIC 2 4 hours
Continuation of 113.

115. ELEMENTARY RUSSIAN 1 4 hours
Self-instruction, including use of tapes and native language tutors; designed to develop fluency in spoken Russian. Prerequisite: Permission of chairwoman. Offered alternate years.

116. ELEMENTARY RUSSIAN 2 4 hours
Continuation of 115.

HEALTH AND PHYSICAL EDUCATION
(Department 143)

Professors Stier (Chairman), Ludwig; Associate Professors Campoli, Daugherty, Hood, Lauth, Roberson, Strayer, Wallace; Assistant Professors Mansfield, R. West; Instructor Clarke.

The purposes of this department include: 1) to improve the quality of living by providing opportunities for students to acquire scientific knowledge, skills, favorable attitudes, desirable habits of personal and community health, physical activities and safety, 2) to prepare teachers of health education, physical education, drivers education, and coaches of sports activities for the elementary and secondary schools, 3) to prepare students to do graduate work in health education, physical education, safety education, recreation, coaching, athletic training and athletic/sports management as well as other fields, 4) to prepare students for leadership roles in health, physical education, recreation, athletic training, drivers education, coaching, athletic/sport management, 5) to provide opportunities for individuals to participate in a variety of recreational, intramural and intercollegiate activities, 6) to prepare water safety instructors, 7) to prepare
athletic trainers through the apprenticeship program of the National Athletic Trainers Association (NATA), 8) to prepare registered officials for sports activities; 9) to provide instruction to the general student body and other members of the university community for the development of skills, knowledge and appreciation of and positive attitudes, practices and habits towards lifetime, leisure physical activities.

SPECIAL REQUIREMENTS FOR FUTURE TEACHERS WITHIN THE DEPARTMENT

To satisfy the requirements for a teaching field in health and physical education, all students are required to complete the following for final approval by the department.

1. Participation during the junior year in two of the three courses 304-305-306 practical techniques of teaching and assisting in health and physical education.

2. Completion of field experiences required by the Education Department.

3. Participation in the intramural program at the University. At least one quarter must be devoted to supervising, officiating, organizing and administering these programs.

4. Affiliation in some capacity with one of the intercollegiate sports under the guidance of the varsity head coach.

5. Active participation within the physical education majors’ student organizations during the student’s pursuit of the curricular offerings.

6. Successful completion of one quarter of aquatics prior to graduation.

REQUIRED PHYSICAL EDUCATION SERVICE COURSES

Physical Education services classes meet two hours per week for one quarter hour credit. The physical education courses are given out-of-doors, in McIntosh Center and in the gymnasium. Service classes are graded on the S/U basis and designed to fit the needs, abilities and interests of the individual student.

Two of the three required hours must be taken in the gymnasium. However, the other one hour may be taken in the gymnasium or in McIntosh Center. The required physical education service courses are not sequential and must be completed prior to senior status. None of the elective courses may be repeated. Additional laboratory fees are charged for bowling, billiards, archery, racquetball, golf and tennis.

The following activity courses are offered: all carry one quarter hour credit; a maximum of six hours may be counted toward graduation. No more than one quarter hour required physical education service credit per varsity sport will be allowed.

000. HEALTH AND PHYSICAL EDUCATION ORIENTATION

001 VARSITY FOOTBALL PARTICIPATION (Men)
002 VARSITY CROSS COUNTRY PARTICIPATION (Men)
003 VARSITY SOCCER PARTICIPATION (Men)
004 VARSITY VOLLEYBALL PARTICIPATION (Women)
Intramural Sports. An intramural program offers activity for each university student. The following sports are offered for men: touch football, basketball, softball, billiards, ping pong, bowling, swimming, handball, racquetball, volleyball, tennis, wrestling, track, golf, one-on-one basketball, and horseshoes; for women: softball, volleyball, basketball, badminton, swimming, racquetball, three-on-three basketball, three-on-three volleyball, table tennis, archery, track and field; coed: water polo, volleyball, basketball and softball.
Athletic Training Certification Program

The Athletic Trainer is an important part of a complete athletic program. He/she is the individual charged with preventing athletic injury whenever possible, administering first aid if an injury should occur, and supervising the rehabilitation program designed in cooperation with the team physician.

Students wishing to pursue the Athletic Training Curriculum are required to pursue a college major in another academic discipline. Candidates may qualify to be examined for National Athletic Training Association (NATA) certification through the apprenticeship program (program A) or may seek the institutional certification program (program B).

In the apprenticeship program students are able to take part in 1800 hours of practical work experience throughout the four years of study. These opportunities enable the prospective athletic trainer to perform many of the duties of an athletic trainer while under the direct supervision of the Head Athletic Trainer at Ohio Northern University.

Upon successful completion of the athletic training curriculum and upon the recommendation of the Program Director, the student will be able to sit for the National Athletics Trainers' Association Certification Examination by virtue of the apprenticeship program at Ohio Northern University.

The University also provides an alternative program involving only 400 hours of practical work experiences at the University for future athletic trainers. Individuals successfully completing this option will receive an institutional certificate as an athletic trainer and must obtain an additional 1400 hours of practical work experience while serving as an athletic trainer (under a NATA trainer) prior to sitting for the NATA examination.

Additional information may be obtained by contacting the Chairperson of the Health and Physical Education Department in King-Horn Convocation and Physical Education Center.

Athletic Coaching Certification Program

Ohio Northern University offers, through the Ad-Hoc Committee of the Ohio Association of Physical Education Directors, a "Voluntary Endorsement Certificate" for Athletic Coaching in the secondary schools of the State of Ohio. This Athletic Coaching Certificate is awarded by Ohio Northern University as evidence of the successful completion of a course of study leading to competency in coaching interscholastic sports for male and female students. Required courses of study leading to the Coaching Certificate from this University include:

- 112 First Aid and Safety Education 3 hours
- 303 Organization and Administration of Health, Physical Education, Recreation and Athletics 3 hours
- 324 Psychology of Coaching 2 hours
- 334
- 335 \{ Advanced Coaching; Internship/Externship \} 3 maximum
- 336 \{ one course \} 1 hour/ 3 maximum
- 343 Basic Athletic Training 3 hours
375 Advanced Athletic Training 4 hours
Plus—two theory of coaching courses 4 hours
(308, 310, 319, 320, 321, 322, 323, 327)
TOTAL minimum 20-22 hours
(22 maximum)

Major in Health and/or Physical Education

The department offers a major in the following programs:
1. *Health and Physical Education (Dual) K-12
2. *Physical Education K-12
3. *Health Education K-12
4. *Physical Education 7-12

Additionally, the students are able to obtain a certification (although not a major), in the following:
5. Health Education 7-12
6. Elementary Physical Education K-6
7. Physical Education 7-12

Finally, the department provides courses of study leading to certification in the following areas:
8. Drivers Education—by the State of Ohio
9. Athletic Training (Program A), apprenticeship program of the National Athletic Trainers Association (NATA); Program B, institutional certification.
10. Athletic Coaching Certification—by Ohio Northern University

* The areas indicated are the only areas that the department recognizes as a major. The other areas of certification require a college major in another academic discipline. For specific information concerning these areas of certification, please contact the Health and Physical Education Department Chairman.

111. CURRENT PERSONAL HEALTH PROBLEMS 3 hours
The identification and study of timely health issues from a personal viewpoint.

112. FIRST AID AND PERSONAL SAFETY 3 hours
Lectures, discussion and practice in the giving of first aid in emergencies. The American Red Cross Certificate and CPR certification may be obtained by students who pass an examination.

114. ADVANCED LIFESAVING 2 hours
To develop knowledge and skills to aid in the prevention of aquatic accidents and an ability to give assistance to victims. The American Red Cross Advanced Lifesaving certificate/emblem may be obtained by passing an examination. Prerequisite: instructor approval

115. WATER SAFETY INSTRUCTION 3 hours
Teaching of swimming and water safety skills, methods and techniques. Successful completion of the course will lead to American Red Cross Water Safety Instruction certification. Meets 5 days per week. Prerequisite: current certification in advanced lifesaving.
119. SCHOOL AND COMMUNITY HEALTH 3 hours
Skills and knowledge for aiding teachers and others to observe and understand the school child in health and illness; the health program of the public schools and the relationship of the school to the students' habits, attitudes and knowledge conducive to good health. The study of health matters with focus on health problems amenable to community action.

132. GYMNASTICS METHODS 2 hours
The fundamental skills, methods and techniques in teaching the following activities: trampoline, tumbling, parallel bars, uneven bars, rings, horse, free excercise, balance beam and vaulting.

133. GENERAL METHODS 2 hours
The fundamental skills, methods and techniques in teaching the following activities: track and field, basketball, softball, recreational games.

147. BASIC MOVEMENT 2 hours
The principles and laws of motion as applied to basic human movement and performance. An introduction to the basic locomotor and axial movements possible in the human body and the utilization of these basic movements as they are combined in the efficient performance of complex tasks.

151. FOUNDATIONS OF HEALTH, PHYSICAL EDUCATION, RECREATION AND ATHLETICS 3 hours
The student is introduced to five foundation areas - the historical, philosophical, psychological, physiological, and sociological - of physical education, health education, recreation, safety and athletics. A sixth unit treats the scope, justification and needs of the profession and professional opportunities.

211. TEAM SPORTS 2 hours
The fundamental skills, methods and techniques in teaching the following activities: speedball, soccer, various versions of touch football, field hockey and volleyball.

212. DANCE 3 hours
Required of all physical education majors. The fundamental skills and methods of teaching various areas of the dance.

213. INDIVIDUAL AND DUAL ACTIVITIES 2 hours
The fundamental skills, methods and techniques in teaching the following activities: tennis, badminton, archery, golf, weight lifting, wrestling, and bowling.

219. PSYCHOLOGICAL FACTORS IN DRIVING 3 hours
A study of behavior with emphasis on attitudes, motivation, and adjustment and their relationship to unsafe driving. Investigation of principles and methods appropriate in identifying, understanding, and modifying unsatisfactory driving behavior. Prerequisite: Psychology 100. Course marked S/U.
223. KINESIOLOGY 3 hours
The study of the general body mechanics of the human organism; the activities of the physical education program in their relation to coordination and the proper body mechanics; analysis of movement. Prerequisites: Physiology 231 and 232.

233. PHYSICAL EDUCATION FOR THE ELEMENTARY SCHOOL 3 hours
The aims, objectives, methods, and techniques of teaching physical education in the elementary school. The need for physical activity and practical application of theories are emphasized. Prerequisite: sophomore standing.

271. MOTOR LEARNING 3 hours
The study of rather permanent change in performance brought about through practice and excludes changes due to maturation, drugs or nutrients.

303. ORGANIZATION AND ADMINISTRATION OF HEALTH, PHYSICAL EDUCATION, RECREATION AND ATHLETICS 3 hours
Examination of the philosophy, principles, problems, policies, and procedures essential in the organization and administration of meaningful programs in health education, physical education, recreation and athletics. Prerequisite: One year of physical education for majors and junior status.

304. PRACTICAL TECHNIQUES OF TEACHING AND ASSISTING IN HEALTH AND PHYSICAL EDUCATION 1 hour
Two hours required of all physical education majors in their junior year.

305. PRACTICAL TECHNIQUES OF TEACHING AND ASSISTING IN HEALTH AND PHYSICAL EDUCATION 1 hour
Continuation of 143-304.

306. PRACTICAL TECHNIQUES OF TEACHING AND ASSISTING IN HEALTH AND PHYSICAL EDUCATION 1 hour
Continuation of 143-305.

308. TECHNIQUES-COACHING VOLLEYBALL 2 hours
To develop a basic expertise in the techniques and knowledge of coaching volleyball. To provide laboratory experiences in the practical application of techniques and knowledge of coaching volleyball. Upon successful completion of course requirements and instructor's recommendation, participants may receive USVBA Level I certification.

310. TECHNIQUES - COACHING SOFTBALL 2 hours
To develop a basic expertise in the knowledge and techniques of coaching softball. To provide laboratory experiences in the practical application of techniques and knowledge of coaching softball.

315. OFFICIATING-VOLLEYBALL 1 hour
Knowledge and techniques of officiating volleyball. National Federation rules. Laboratory experiences during intramural volleyball. Offered odd numbered years only.
317. THEORY OF TRACK AND FIELD OFFICIATING 1 hour
Knowledge and techniques of officiating track and field. National Federation rules. Laboratory experiences during intramural track and field. Offered even numbered years only.

319. THEORY AND METHOD OF COACHING TRACK 2 hours
Methods and forms for all of the events in track and field. Lectures, reports, demonstrations and practice.

320. THEORY OF COACHING AND OFFICIATING WRESTLING 1 hour
Equipment, fundamentals of the art and skill of wrestling. Prerequisite for students seeking state certification in physical education; junior status. Offered even numbered years only.

321. THEORY OF FOOTBALL COACHING 2 hours
Equipment, fundamentals of the game, kicking, passing, handling the ball, tackling, blocking; individual position play; offensive and defensive formation; strategy and generalship. To prepare students to coach on the junior high and senior high level.

322. THEORY OF COACHING BASKETBALL 2 hours
The fundamentals: passing, shooting, dribbling, feinting and pivoting, styles of offense and defense, equipment, conditioning, the handling of a team in games. Lectures, demonstrations and practice.

323. THEORY OF COACHING BASEBALL 2 hours
Individual position and team play in men's baseball. Lectures, reports, demonstration, and practice.

324. PSYCHOLOGY OF COACHING 2 hours
The cultural, emotional, psychological and sociological aspects of coaching. Player-coach relationship, understanding the athlete, improving coaching effectiveness. Offered even numbered years only.

326. CO-CURRICULAR ACTIVITIES 1 hour
Theory and practice of the organization and administration of co-curricular activities commonly associated with the girls physical education program. Offered odd numbered years only.

327. THEORY OF COACHING SOCCER 2 hours
Equipment, fundamentals of the game: kicking, passing, playing the ball, strategy and generalship. Offered on demand.

334. ADVANCED COACHING INTERNSHIP/EXTERNSHIP 1-3 hours
Coaching under supervision in all sports in season. Hours arranged. Six hours maximum toward graduation. Prerequisite: permission of chairperson.

335. ADVANCED COACHING - INTERNSHIP/EXTERNSHIP 1-3 hours
Continuation of 334.
336. ADVANCED COACHING - INTERNSHIP/EXTERNSHIP  1-3 hours
Continuation of 335.

341. FOOTBALL OFFICIATING  2 hours
Study of the football rules and mechanics from the standpoint of the player, coach and official. Offered odd numbered years only.

342. BASKETBALL OFFICIATING  2 hours
The study of basketball rules and mechanics from the standpoint of player, coach and official.

343. BASIC ATHLETIC TRAINING  3 hours
To meet the need of the high school coach; training procedures and conditioning of athletic teams for all sports; treatment of athletic injuries. Laboratory designed to familiarize student with taping techniques. Lab fee.

350. HEALTH METHODS AND EVALUATION  3 hours
For the special teacher and supervisor of health; health problems arising in a school system; methods and materials for teaching health and conducting evaluation. Prerequisites: two quarters of health, one of which must be 143-111 and junior standing.

351. METHODS IN HEALTH AND PHYSICAL EDUCATION.  3 hours
Methods, devices and techniques which are most effective in the teaching of the discipline in the public schools. Lab experiences in area schools. Prerequisite: one year of physical education for majors and junior status.

360. TESTS AND MEASUREMENT OF HEALTH, PHYSICAL EDUCATION, RECREATION AND ATHLETICS  3 hours
Fundamental considerations of measurement; physical education and health measurements; test evaluation; criteria of tests; validity of tests; accuracy of tests; physical fitness; skills tests; application of measurement; elements of statistics.

371. MEDICAL ASPECTS OF ATHLETIC TRAINING; EVALUATION AND TREATMENT OF ATHLETIC INJURIES  4 hours
These sequential courses provide an indepth study of proper procedures for returning the injured athlete to competition after injury. An advanced discussion of underlying principles related to proper on-the-field examination of the injured athlete, follow up care, and proper rehabilitation after acute, chronic and surgical injuries. Also provides discussion of principles and techniques of therapeutic modalities. Prerequisites: Biology 231,232, and 233; Health & PE 112 and 343.

372. MEDICAL ASPECTS OF ATHLETIC TRAINING; EVALUATION AND TREATMENT OF ATHLETIC INJURIES  4 hours
Continuation of 371.

375. ADVANCED ATHLETIC TRAINING  4 hours
In depth learning process involving the techniques of athletic strapping and
bandaging, selection of proper training room equipment, special protective padding of injuries, and other facets of training room facilities. Prerequisites: Health & PE 343.

402. ADAPTIVE AND CORRECTIVE PHYSICAL EDUCATION 3 hours
For the teachers who are concerned with the physical education of the handicapped; to develop an understanding of the various handicapping conditions and to explore methods of adapting physical activities to meet the needs of the atypical student in the physical education class. Prerequisite: Health & PE 223.

433. DRIVER EDUCATION 3 hours
Actual in-car driving and teaching experiences. For those students who plan to teach driver education in the public/private schools.

434. ORGANIZATION AND ADMINISTRATION OF DRIVER AND TRAFFIC SAFETY 3 hours
Organizational and administrative aspects of driver and traffic education as they relate to the total school and other specialized programs. For those who seek state certification in driver training. Historical and philosophical aspects, evaluation, related professional organizations and occupational opportunities.

490. SPECIAL TOPICS IN HEALTH AND PHYSICAL EDUCATION 3 hours

494. HEALTH SEMINAR
An inddepth analysis of current health problems, issues and trends as they apply to the teacher of health education. Offered even numbered years only.

497. INDEPENDENT STUDY IN HEALTH AND PHYSICAL EDUCATION 1-3 hours

HISTORY, POLITICAL SCIENCE, AND PUBLIC ADMINISTRATION (Department 132)

Professors Saffell (Chairman), Davis, Ludanyi, Peltier; Associate Professors Gilbreth, Hammond, Sefton; Instructor Denney.

The WILFRED E. BINKLEY CHAIR OF HISTORY AND POLITICAL SCIENCE, inaugurated in 1971, has been made possible by a grant from the Carthage Foundation of Pittsburgh. The 1982-83 recipient of this professorship is David S. Sefton, associate professor of history.

The KERNAN ROBSON CHAIR IN POLITICAL SCIENCE, inaugurated in 1972, has been made possible by a trust established by the late Kernan Robson. The 1982-83 recipient of this professorship is Terry J. Gilbreth, associate professor of political science.

The department offers separate majors in history, political science, and public administration. Minors are available in history and in political science. To pursue a dual major in history and political science, students must complete all the requirements for each separate major.
A major in history and political science prepares students generally for careers in teaching, law, journalism, government service, or business. Public Administration is designed especially for students seeking a career in government service or in law. There are special departmental advisers for prelaw, public administration, and teacher certification.

The department offers majors a freshman advising program; a career development program; a History-Political Science-Public Administration Club; and Phi Alpha Theta, the national history honorary. In addition, public service internships are available at all levels of government, including the Ohio State Legislature. Students annually participate in the Model United Nations in New York City. The department also offers students the opportunity to participate in the Washington Semester Program sponsored by American University.

HISTORY

Specific requirements for the history major:
(1) orientation 000
(2) history 100
(3) political science 201-202-203
(4) history 211-212-213
(5) history 215-216
(6) one contemporary affairs course (221-222-223-224-225-226)
(7) 27 hours history electives, distributed as follows:
   World History—6 hours (excluding contemporary affairs courses)
   American History—6 hours
   Electives—15 hours (excluding contemporary affairs courses)

000. ORIENTATION

Familiarization with the department, requirements for majors, planning a program of courses, the University catalog and library. Required of departmental majors. Also listed as Political Science 000.

100. UNDERSTANDING HISTORY

Concepts and trends in world history. A conceptual and thematic approach to the meaning and content of history.

211. HISTORY OF THE UNITED STATES TO 1800

The political, social and economic development of the United States from the colonial period to the present. Open to freshmen.

212. HISTORY OF THE UNITED STATES: 1800 TO 1898

Continuation of 211.

213. HISTORY OF THE UNITED STATES 1898 TO THE PRESENT TIME

Continuation of 212.

215. CRISES IN WESTERN CIVILIZATION I

A broad historical study, focusing on the major crises in Western Civilization from ancient times to the present, designed to introduce the beginning stu-
dent to the ideas, attitudes, and institutions basic to civilization as it de-
veloped in the West. Open to freshmen.

216. CRISES IN WESTERN CIVILIZATION II 3 hours
Continuation of 215.

221. CONTEMPORARY EUROPE 3 hours
An explanation of the political, socioeconomic and intellectual development
of Europe since the conclusion of the second World War. Also listed as Po-
litical Science 221. Open to freshmen.

222. CONTEMPORARY ASIA 3 hours
An examination of the political, socioeconomic and intellectual development
of Asia since the conclusion of the second World War. Also listed as Political
Science 222. Open to freshmen.

223. CONTEMPORARY AFRICA 3 hours
An examination of the political, socioeconomic and intellectual development
of Africa since the conclusion of the second World War. Also listed as Political
Science 223. Open to freshmen.

224. COMTEMPORARY MIDDLE EAST 3 hours
An examination of the political, socioeconomic and intellectual development
of the Middle East since the conclusion of the second World War. Also listed
as Political Science 224. Open to freshmen.

225. CONTEMPORARY LATIN AMERICA 3 hours
An examination of the political, socioeconomic and intellectual development
of Latin America since the conclusion of the second World War. Also listed
as Political Science 225. Open to freshmen.

226. HUMAN GEOGRAPHY 3 hours
An analysis of the elements of human geography, including cultures, cultural
regions, race, language and religion, human population, population move-
ment, urbanization, and political organization. Also listed as Political Science
226. Open to freshmen. (Formerly History 400.)

290. SPECIAL TOPICS IN HISTORY 1-3 hours

303. HISTORY OF OHIO 3 hours
The political and cultural evolution of the state from prehistoric times to the
present. Attention also will be given to Ohio as a part of the Old Northwest
and the Middle West.

321. ENGLISH HISTORY 3 hours
The English people in their political, social and institutional development;
the growth of the British Empire and the evolution of the British Common-
wealth of Nations.

322. ENGLISH HISTORY 3 hours
Continuation of 321.
323. ENGLISH HISTORY 3 hours
Continuation of 322.

324. RUSSIAN HISTORY I 3 hours
The social, political, and economic development of the Russian state from Ancient Kiev to Appanage Russia and the Mongol Invasion to the Muscovite State of Ivan the Dread and the Time of Troubles.

325. RUSSIAN HISTORY II 3 hours
A survey of Imperial Russia and the Soviet Union. Emphasis will be placed on the political, social and intellectual climate from Peter the Great to Nicholas II and the intellectual climate leading to the Revolution of 1917.

326. MEDIEVAL EUROPE 3 hours
Europe from the decline of the Roman Empire to the beginning of the Renaissance. Special attention is given to those institutions most instrumental in shaping modern European development.

327. THE FRENCH REVOLUTIONARY ERA 3 hours
A survey of France during the "old regime," social classes, the establishment of constitutional monarchy, the Republic and Robespierre, the crowds in the French Revolution, and Napoleon Bonaparte as protector of the reforms of the Revolution.

328. RENAISSANCE AND REFORMATION 3 hours
The political evolution of the Italian communes; the cultural development of the period; the Church and European society during the late Middle Ages and the expansion of Protestantism in Europe.

329. AGE OF EUROPEAN ABSOLUTISM 3 hours
A survey of European civilization during the Early Modern Period (1500-1789) with an emphasis on the development of the national state system, the concepts of divine right monarchy and absolutism, and the eighteenth century Enlightenment. Alternate years.

348. THE AMERICAN CONSTITUTION 3 hours
An historical and legal approach to the interpretation of the constitution of the United States. Also listed as Political science 348.

349. THE AMERICAN CONSTITUTION 3 hours
Continuation of 348. Also listed as Political Science 349.

353. AMERICAN COLONIAL AND REVOLUTIONARY HISTORY 3 hours
An intensive analysis of colonial American history, with particular emphasis on Massachusetts, Virginia, and Pennsylvania and a survey of those conditions which led to the Revolutionary War.

354. CIVIL WAR AND RECONSTRUCTION 3 hours
An intensive analysis of the Civil War era in American history. Special em-
phasis will be placed on slavery and other causal factors which precipitated the war between the states.

360. HISTORY OF AMERICAN BUSINESS AND LABOR 3 hours
An historical study exploring the interaction of economic and political forces as a factor helping to explain the position occupied by business enterprises and labor organizations in American political life. Also listed as Political Science 360.

361. RECENT AMERICAN HISTORY I 3 hours
An intensive analysis of American history from the beginning of World War I until the conclusion of World War II. Also listed as Political Science 361.

362. RECENT AMERICAN HISTORY II 3 hours
An examination of the major social, economic, and political issues in American history since World War II. Also listed as Political Science 361.

377. HISTORY OF MODERN EUROPE I 3 hours
A survey focusing on Western Europe from 1815 to 1870. Emphasizes the search for stability in an age of revolution, industrialization, and unification.

378. HISTORY OF MODERN EUROPE II 3 hours
A survey of Western Europe from 1870 to the present; considers changes brought on by the "Second Industrial Revolution," imperialism, the rise of "totalitarianism," World Wars, Civil War, and the post-war period.

381. U S FRONTIER 3 hours
An examination of territorial expansion from colonial times to the end of the nineteenth century, emphasizing Indian relations, land policy, transportation and trade, and the influence of the West on American ideals and institutions. The course includes a brief consideration of comparative frontiers.

387. AMERICAN POLITICAL THOUGHT 3 hours
An examination of American political theory commencing with the colonial period and proceeding to modern political thinkers. Also listed as Political Science 387.

404. AMERICAN CULTURAL HISTORY 3 hours
The evolution of American culture from the colonial era to the present day in philosophy, theology, belles-lettres, political and economic theory, social theory, historical literature, art, music, and drama.

414. THE ANCIENT WORLD 3 hours
The political, socio-economic and cultural development of Near Eastern, Greek, and Roman Civilization during the ancient period.

451. HISTORY OF LAW 3 hours
A survey of the evolving principles of law as an instrument of social control, with an examination of legal norms as developed in Greek and Roman systems,
canon law, law merchant and law maritime, civil law, common law and equity, and the Asiatic system. Also listed as Political Science 451.

452. AMERICAN FOREIGN RELATIONS 3 hours
A conceptual review of the inception, development and contemporary interpretation of the major foreign policies of the United States. Also listed as Political Science 452.

455. WESTERN POLITICAL THOUGHT 3 hours
An examination of Western political theory commencing with the ancient period (Plato, Aristotle, Cicero) and proceeding to Machiavelli. Also listed as Political Science 455.

456. WESTERN POLITICAL THOUGHT 3 hours
An examination of Western political theory commencing with the contract theorists (Rousseau, Locke, Hobbes) and proceeding to the age of the French Revolution (Burke). Also listed as Political Science 456.

457. WESTERN POLITICAL THOUGHT 3 hours
An examination of Western political theory commencing with the early nineteenth century (Hegel) and proceeding to the twentieth century (Lenin, Nietzsche). Also listed as Political Science 457.

471. HISTORY OF THE OTTOMAN EMPIRE 3 hours
An examination of the emergence, expansion and decline of Turkish power in South-Eastern Europe, Asia Minor, Central Asia and North Africa from the time of the Seljuks to the Young Turks, with particular emphasis on the empire's military, political and cultural legacy.

490. SPECIAL TOPICS IN HISTORY 1-3 hours

494. SEMINAR IN HISTORY 1-3 hours

497. INDEPENDENT STUDY IN HISTORY 1-3 hours
Approval of department chairman required prior to registration.

POLITICAL SCIENCE

(1) orientation 000
(2) political science 105
(3) political science 201-202-203
(4) history 211-212-213
(5) one contemporary affairs course (221-222-223-224-225-226)
(6) western political thought 455
(7) political thought 456 or 457 or 387
(8) 27 hours political science electives, distributed as follows:
   World Politics—6 hours (excluding contemporary affairs courses)
   U.S. Government—6 hours
   Electives—15 hours (excluding contemporary affairs courses)
000. ORIENTATION
1 hour
Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Required of departmental majors. Also listed as History 000.

105. MODERN POLITICAL CONFLICTS AND ISSUES
3 hours
Fundamental political processes and principles, placed in the context of contemporary domestic and world problems.

201. AMERICAN NATIONAL GOVERNMENT
3 hours
The origin, development, structure and functions of the national government in the United States. Open to freshmen.

202. AMERICAN NATIONAL GOVERNMENT
3 hours
Continuation of 201.

203. STATE AND LOCAL GOVERNMENT
3 hours
An examination of the structures and functions of state and local governments in the United States. State and local relations with each other and with the federal government will be examined also. Open to freshmen.

221. CONTEMPORARY EUROPE
3 hours
An examination of the political, socioeconomic and intellectual development of Europe since the conclusion of the second World War. Also listed as History 221. Open to freshmen.

222. CONTEMPORARY ASIA
3 hours
An examination of the political, socioeconomic and intellectual development of Asia since the conclusion of the second World War. Also listed as History 222. Open to freshmen.

223. CONTEMPORARY AFRICA
3 hours
An examination of the political, socioeconomic and intellectual development of Africa since the conclusion of the second World War. Also listed as History 223. Open to freshmen.

224. CONTEMPORARY MIDDLE EAST
3 hours
An examination of the political, socioeconomic and intellectual development of the Middle East since the conclusion of the second World War. Also listed as History 224. Open to freshmen.

225. CONTEMPORARY LATIN AMERICA
3 hours
An examination of the political, socioeconomic and intellectual development of Latin America since the conclusion of the second World War. Also listed as History 225. Open to freshmen.

226. HUMAN GEOGRAPHY
3 hours
An analysis of the elements of human geography, including cultures, cultural regions, race, language and religion, human population, movement, urbanization, and political organization. Also listed as History 226. Open to freshmen. (Formerly Political Science 400.)
291. SPECIAL TOPICS IN POLITICAL SCIENCE  1-3 hours

312. URBAN POLITICS AND ADMINISTRATION  3 hours
An examination of urban governments, the problems they face, and the growing importance of professional urban administrators. Analysis of current federal policy as it affects urban America.

334. DEMOCRATIC POLITICAL SYSTEMS  3 hours
A comparison of the politics of contemporary democracies, stressing the impact of political culture and the operations of governmental institutions, parties and interest groups in the process of public policy-making.

335. COMMUNIST POLITICAL SYSTEMS  3 hours
A comparison of the politics of contemporary communist systems, stressing the operations of the single-party control system, the role of governmental agencies and ideological orientations.

336. DEVELOPING POLITICAL SYSTEMS  3 hours
A comparison of contemporary politics in developing societies, stressing the impact of cultural fragmentation, modernization, social unrest and rising expectations on the stability and effectiveness of governmental institutions and processes.

347. AMERICAN POLITICAL PARTIES AND ELECTIONS  3 hours
An examination of the leadership, organization, activities, and role of political parties in the American political process and an analysis of the conduct of congressional and presidential elections.

348. THE AMERICAN CONSTITUTION  3 hours
An historical and legal approach to the interpretation of the constitution of the United States. Also listed as History 348.

349. THE AMERICAN CONSTITUTION  3 hours
Continuation of 348. Also listed as History 349.

360. HISTORY OF AMERICAN BUSINESS AND LABOR  3 hours
An historical study exploring the interaction of economic and political forces as a factor helping to explain the position occupied by business enterprises and labor organizations in American political life. Also listed as History 360.

361. RECENT AMERICAN HISTORY I  3 hours
An intensive analysis of American history from the beginning of World War I until the conclusion of World War II. Also listed as History 361.

362. RECENT AMERICAN HISTORY II  3 hours
An examination of the major social, economic, and political issues in American history since World War II. Also listed as History 362.

363. PUBLIC ADMINISTRATION AND POLITICS  3 hours
Bureaucrats as actors in the American political system. Their sources of power
291. SPECIAL TOPICS IN POLITICAL SCIENCE  1-3 hours

312. URBAN POLITICS AND ADMINISTRATION  3 hours
An examination of urban governments, the problems they face, and the growing importance of professional urban administrators. Analysis of current federal policy as it affects urban America.

334. DEMOCRATIC POLITICAL SYSTEMS  3 hours
A comparison of the politics of contemporary democracies, stressing the impact of political culture and the operations of governmental institutions, parties and interest groups in the process of public policy-making.

335. COMMUNIST POLITICAL SYSTEMS  3 hours
A comparison of the politics of contemporary communist systems, stressing the operations of the single-party control system, the role of governmental agencies and ideological orientations.

336. DEVELOPING POLITICAL SYSTEMS  3 hours
A comparison of contemporary politics in developing societies, stressing the impact of cultural fragmentation, modernization, social unrest and rising expectations on the stability and effectiveness of governmental institutions and processes.

347. AMERICAN POLITICAL PARTIES AND ELECTIONS  3 hours
An examination of the leadership, organization, activities, and role of political parties in the American political process and an analysis of the conduct of congressional and presidential elections.

348. THE AMERICAN CONSTITUTION  3 hours
An historical and legal approach to the interpretation of the constitution of the United States. Also listed as History 348.

349. THE AMERICAN CONSTITUTION  3 hours
Continuation of 348. Also listed as History 349.

360. HISTORY OF AMERICAN BUSINESS AND LABOR  3 hours
An historical study exploring the interaction of economic and political forces as a factor helping to explain the position occupied by business enterprises and labor organizations in American political life. Also listed as History 360.

361. RECENT AMERICAN HISTORY I  3 hours
An intensive analysis of American history from the beginning of World War I until the conclusion of World War II. Also listed as History 361.

362. RECENT AMERICAN HISTORY II  3 hours
An examination of the major social, economic, and political issues in American history since World War II. Also listed as History 362.

363. PUBLIC ADMINISTRATION AND POLITICS  3 hours
Bureaucrats as actors in the American political system. Their sources of power
425. THE AMERICAN CONGRESS
An examination of the structure and operation of Congress; committees, rules and procedures, party organization, and executive oversight; contributions from the President, interest groups, public opinion, and the courts.

3 hours

426. THE AMERICAN LEGAL SYSTEM
A political analysis of how justice is administered in American courts. The roles of lawyers, judges, and juries are examined as they operate within the structure and rules of the legal system. The organization of American courts, both federal and state, is studied with attention directed to trials, appellate proceedings, and constraints on the courts.

3 hours

427. THE SUPREME COURT AND CIVIL LIBERTIES
An examination of constitutional rights, due process and equal protection of the law in the United States. Particular emphasis on recent Supreme Court decisions regarding the rights of black Americans, freedom of expression and the rights of criminal defendants.

3 hours

436. AMERICAN PUBLIC POLICY
An introduction to the basic dynamics and problems of the American policymaking process, as well as some of the more widely used analytical approaches to public policy, especially in such fields as environmental policy and public welfare.

3 hours

441. INTERNATIONAL LAW AND ORGANIZATIONS
An examination of the structure, operation, and legal setting of international organizations, with particular emphasis on the United Nations as well as regional institutions such as the European Common Market.

3 hours

443. ADMINISTRATIVE LAW
An examination of the internal bureaucratic judicial process, its relationship to the broader legal system and the changing attitudes of the Supreme Court toward administration rule-making.

3 hours

451. HISTORY OF LAW
A survey of the evolving principles of law as an instrument of social control, with an examination of legal norms as developed in Greek and Roman systems, canon law, law merchant and law maritime, civil law, common law and equity, and the Asiatic system. Also listed as History 451.

3 hours

452. AMERICAN FOREIGN RELATIONS
A conceptual review of the inception, development and contemporary interpretation of the major foreign policies of the United States. Also listed as History 452.

3 hours

455. WESTERN POLITICAL THOUGHT
An examination of Western political theory commencing with the ancient period (Plato, Aristotle, Cicero) and proceeding to Machiavelli. Also listed as History 455.

3 hours
456. WESTERN POLITICAL THOUGHT
An examination of Western political theory commencing with the contract theorists (Rousseau, Locke, Hobbes) and proceeding to the age of the French Revolution (Burke). Also listed as History 456.

457. WESTERN POLITICAL THOUGHT
An examination of Western political theory commencing with the early nineteenth century (Hegel) and proceeding to the twentieth century (Lenin, Nietzsche). Also listed as History 457.

475. UNITED NATIONS TODAY
Prepares students to participate in the National Model United Nations in New York City. This is an integrated and serious simulation of many aspects of the United Nations. Students travel to New York City in the spring. Application to and approval of the departmental Model U.N. Committee are prerequisites for registering for this course. May be repeated three times for credit.

481. PUBLIC SERVICE INTERNSHIP PROGRAM
Field experience in the area of public service. Selected students upon proper application, screening, and acceptance, will work in close relationship with public offices and officials. Those interns serving in a local agency would generally receive six quarter hours credit for approximately ten hours of service per week, while those interns serving in Columbus or Washington D.C. on a full-time quarterly basis, would generally receive fifteen hours credit. Prerequisites: consultation with the departmental internship committee and completion of the application process. A maximum of 6 hours will count toward major requirements.

491. SPECIAL TOPICS IN POLITICAL SCIENCE
1-3 hours

495. SEMINAR IN POLITICAL SCIENCE
1-3 hours

498. INDEPENDENT STUDY IN POLITICAL SCIENCE
1-3 hours
Approval of department chairman required prior to registration.

PUBLIC ADMINISTRATION
Specific requirements for the public administration major:

(1) Political Science 105
(2) Political Science 201-202-203
(3) Political Science 312
(4) Political Science 363 and 364
(5) Political Science 436
(6) Political Science 373
(7) Political Science 443
(8) Political Science 372
(9) History 211-212-213
(10) Economics 202 and 203
(11) Economics 423
(12) Mathematics 142
(13) Problems in Public Policy and Administration—6 hours

Minors

<table>
<thead>
<tr>
<th>Political Science</th>
<th>History</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political Science 105</td>
<td>History 100</td>
</tr>
<tr>
<td>American National Government 201, 202, 203</td>
<td>American History 211, 212, 213</td>
</tr>
<tr>
<td>Contemporary Affairs 221, 222, 223, 224, 225</td>
<td>Crises in Western Civilization 215, 216</td>
</tr>
<tr>
<td>Political Thought (455, 456, 457 or 387)</td>
<td>Contemporary Affairs 221, 222, 223, 224, 225</td>
</tr>
<tr>
<td>American Politics</td>
<td>World History</td>
</tr>
<tr>
<td>World Politics</td>
<td>U.S. History</td>
</tr>
</tbody>
</table>

Electives 3 hours
Total 33 hours

DEPARTMENTAL ADVISING: PRELAW & TEACHER EDUCATION

In addition to regular academic advisers, the department also provides more specialized prelaw and teacher education advising. Normally, majors interested in prelaw studies will be assigned to the departmental prelaw adviser, who not only assists the student in making a judicious selection of courses, but also maintains a law school catalog library and acts as the department's central information officer in matters related to prelaw education. Similarly, majors interested in a teaching career will be assigned to the departmental teacher education adviser, who not only provides academic advice and guidance, but also supervises the departmental aspects of the student teaching program.

PRELAW PROGRAM

In addition to its emphasis upon prelaw advisement, the department also cooperates with the College of Law at Ohio Northern University relative to the formal “guaranteed admission” prelaw program.

Basically, this program guarantees admission to the Pettit College of Law for those students who maintain at least a 3.30 grade point average during their undergraduate years at Ohio Northern.

Specific curricular requirements are available from the departmental prelaw adviser or from the department chairman.
TEACHER CERTIFICATION WITH MAJOR IN HISTORY OR POLITICAL SCIENCE

<table>
<thead>
<tr>
<th>History</th>
<th>Political Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation 000</td>
<td>Orientation</td>
</tr>
<tr>
<td>1 hour</td>
<td>1 hour</td>
</tr>
<tr>
<td>History 100</td>
<td>Political Science 105</td>
</tr>
<tr>
<td>3 hours</td>
<td>3 hours</td>
</tr>
<tr>
<td>American National Government 201</td>
<td>American History</td>
</tr>
<tr>
<td>202, 203</td>
<td>211, 212, 213</td>
</tr>
<tr>
<td>9 hours</td>
<td>9 hours</td>
</tr>
<tr>
<td>American History</td>
<td>American National</td>
</tr>
<tr>
<td>211, 212, 213</td>
<td>Government 201</td>
</tr>
<tr>
<td>9 hours</td>
<td>9 hours</td>
</tr>
<tr>
<td>Crises in Western Civilization</td>
<td>Contemporary Affairs</td>
</tr>
<tr>
<td>215, 216</td>
<td>221, 222, 223, 224,</td>
</tr>
<tr>
<td>6 hours</td>
<td>225</td>
</tr>
<tr>
<td>3 hours</td>
<td>3 hours</td>
</tr>
<tr>
<td>Contemporary Affairs</td>
<td>Theory 445 and 378,</td>
</tr>
<tr>
<td>221, 222, 223, 224, 225</td>
<td>456 or 457</td>
</tr>
<tr>
<td>3 hours</td>
<td>6 hours</td>
</tr>
<tr>
<td>World History</td>
<td>American Politics</td>
</tr>
<tr>
<td>6 hours</td>
<td>6 hours</td>
</tr>
<tr>
<td>U.S. History</td>
<td>World Politics</td>
</tr>
<tr>
<td>6 hours</td>
<td>6 hours</td>
</tr>
<tr>
<td>Electives</td>
<td>Electives</td>
</tr>
<tr>
<td>15 hours</td>
<td>15 hours</td>
</tr>
<tr>
<td>TOTAL 58 hours</td>
<td>TOTAL 58 hours</td>
</tr>
</tbody>
</table>

COMPREHENSIVE SOCIAL STUDIES CERTIFICATION

Ohio Northern University does not offer a major in Comprehensive Social Studies. Students may, however, obtain such certification through the efficient utilization of free electives by taking the appropriate additional courses which will then qualify the student for teaching certification in Comprehensive Social Studies by the State Department of Education of Ohio.

The following electives taken in addition to the history or political science major qualify the student for certification in Comprehensive Social Studies.

- Economics 100
- Economics 202
- Economics 203
- Geography 400 or 433
- Sociology 105
- Sociology 240 or 245
- Sociology 250
- Social Studies Electives:
  12 hours (the 12 hours of electives must all be taken in the same field, excluding the major—Political Science or History or Economics or Sociology.)
- GRAND TOTAL: 92 quarter hours.

In addition to the requirements for the major or social studies comprehensive and the general education requirements the student must complete the following courses in the Department of Education.

- Education 224, 250, or 251, 342, 370, 380, 450, 480-481.
INDUSTRIAL TECHNOLOGY
(Department 142)

Professor Kain (Chairman); Associate Professor Perusek; Lecturer Greenway.

The courses comprising the curriculum in industrial technology are designed to provide broad, foundational experiences in the practical arts and applied sciences. Carefully structured classroom and laboratory activities feature numerous operations and processes that promote realistic involvement in designing, constructing, manufacturing, energy conversion, transportation, graphic communications and craft related recreational pursuits. All laboratory integrated courses utilize a variety of materials and resources.

Course work and associated laboratory assignments place emphasis on researching, designing, experimenting and fabricating. Design complexities and problem situations offer challenges, with solutions and outcomes derived from application of scientific theory and industry practice.

The department program offers a comprehensive professional-technical education for those whose goals would lead to managerial positions in industry: managers, supervisors, engineering technologists, directors of training, etc. The broad selection of courses in technical areas exceeds state standards for teacher certification.

Two degree programs are available to department majors. The Bachelor of Arts degree is recommended for those desiring industrial arts education certification for teaching. The Bachelor of Science degree is appropriate for the industrial technology major selecting a career option to supplement the technical courses curriculum.

The curriculum of study for the major requires 75 quarter hours of credit in courses described in this section. Four years of study in these courses, the courses in Arts and Sciences, and the courses required for teacher certification, qualifies students for the four-year provisional special certificate. Those who choose the Bachelor of Science degree objectives have options available in several curricular areas outside the major department to develop a special schedule of courses to meet individual interests or career goals.

Prospective teachers seeking a minor in industrial technology to qualify for state certification requirements are required to complete a minimum of 47 quarter hours in courses specified by state standards. A schedule of courses constituting the minor is available in the department. Fulfillment of these requirements, those in the major field of study and teacher education, qualifies the candidate for the four-year provisional certificate.

The department has developed an extensive program of visits to museums, manufacturing centers, and schools. Students are required to participate in these excursions and are encouraged to participate in a variety of organized professional activities.

A major project exhibition is required of all students concentrating in industrial technology.

A detailed curriculum outline for students in the department can be obtained from the department chairman.
000. ORIENTATION 1 hour
An introduction to the department, introduction to college life. Familiarization with the basic curriculum, options. Planning a course program. University student services. The library. The departmental major requirements. Required of all department majors.

110. INDUSTRIAL ARTS ORIENTATION 3 hours
An introduction to industrial arts; philosophical origins and contemporary practices. The fundamentals, processes, operations, and special equipment for each of the several instructional areas of industrial arts. Public school visitations are required.

120. CREATIVE CRAFTS 3 hours
Laboratory experiences in working with craft materials; craft design, wood carving, art metals, wood, plastic, leather and others. (Formerly 200).

121. TECHNICAL DRAWING I 3 hours
Use of instruments, applied geometry, lettering, orthographic projection, and pictorial drawing. (Formerly 111).

122. TECHNICAL DRAWING II 3 hours
Continuation of 121. Drawing developments, intersections, and working drawings. Projects in the main fields of engineering are used. Architectural drawing project. (Formerly 142-112) Prerequisite: Industrial Technology 121.

123. APPLIED DESIGN 3 hours
Emphasis on an awareness of design as it is applied to fabrication and construction, using typical industrial materials. Selected exercises in the development of design as applied to a particular function and material. Study and practice in relating good design to furniture, architecture, interiors, graphics, crafts, and to its application in the manufacture of industrial products; design model construction. (Formerly 113).

210. ELEMENTARY SCHOOL INDUSTRIAL ARTS 3 hours
Introduction to the use of technology and technical activity at the elementary school level to assist children in learning. The use of materials, tools and processes to enhance learning and to assist in developing interests and talents. A presentation of the rationale, materials, creative and manipulative activities. Typical problems and the planning and organizing of the learning environment.

213. WOOD TECHNOLOGY 3 hours
The nature of wood, and its present day applications; forestry, lumbering, grading, preserving, and utilization of wood products and by-products; the identification of common commercial lumbers, strength analysis, control of shrinkage, methods of preservation and beautification; wood fabrication and joining techniques. The study of massproduction as applied to wood fabrication and joining techniques.
241. FINISHING METHODS AND MATERIALS 3 hours
Finishing materials, their composition, qualities, and characteristics; protective agents and preservatives; mixing and matching colors; interior floor and wall treatments and finishes; the application of various finishes to wood and metal.

311. GRAPHIC ARTS 3 hours
The production processes of duplicating graphic and written communications; screen process printing, diazo, block printing, letterpress and offset printing. Photographic processes.

313. METAL CASTING 3 hours
Foundry pattern design and construction; the study of molding materials and equipment; operations and procedures in the construction of sand molds; core construction; melting, pouring and casting of non-ferrous metals. Properties of metals and their alloys. Prerequisite: Industrial Technology 213.

321. METALWORK TECHNOLOGY 3 hours
Fundamentals of general metalwork; layout and pattern drafting, bending, forming, seaming, soldering, resistance and oxyacetylene welding and machining; wrought iron work; construction of fixtures, tools, ornaments, and furniture.

322. PRINTING 3 hours

323. LAPIRARY AND JEWELRY 3 hours
The fundamentals of the art of lapidary; working with natural and synthetic stones including the sawing, shaping, polishing and mounting of jewelry stones, applied art metal fabrication.

330. PHOTOGRAPHY 3 hours
Techniques of photographic composition, camera types, uses and accessories; photographic optics and laboratory methods and materials; dark room developing and printing; color photography.

331. FURNITURE DESIGN AND CONSTRUCTION 3 hours
Advanced cabinetry procedures; techniques in joinery and decorative treatments such as carving, turning, veneering, inlaying, fluting and associated styling elements. One major project is required. Prerequisites: Industrial Technology 110, 213.

332. METAL MACHINING AND MANUFACTURING 5 hours
Production practice and metalwork technology. The engine lathe, shaper, milling machine, grinder, and power hacksaw; machining of bar stock and castings. Prerequisite: Industrial Technology 321.
343. WELDING THEORY AND PRACTICE 3 hours
Welding theory, and weld types; welding metallurgy; electrical resistance and arc welding, oxyacetylene welding, brazing, and burning; welded metal fabrications.

350. CERAMICS 3 hours
(See Art department, 151-255)

353. CONSTRUCTION TECHNOLOGY 3 hours
The utilization of efficient construction practices in the building of modern wood structures; use of carpentry tools and power equipment. Prerequisite: Industrial Technology 121.

402. FUNDAMENTALS OF ELECTRICITY AND ELECTRONICS 5 hours
The principles of electricity and their application to laboratory experiments and to the operation of a variety of electrical devices; introduction to electronics; vacuum tubes, transistors, rectifiers, power supplies, amplifiers, oscillators, transmitters, and receivers.

412. LABORATORY PLANNING AND EQUIPMENT 3 hours
Principles of laboratory planning. Architectural features, laboratory designs. Selection, arrangement, and maintenance of equipment in the modern industrial arts laboratory. Prerequisite: Open to students having 30 hours or more of Industrial Technology courses.

423. INDUSTRIAL ARTS ORGANIZATION AND METHODS 3 hours
A professional course in the methods of teaching industrial arts; objectives, preparing lesson plans, organizing courses, laboratory procedures, instructional materials; and administrative practices, visitations to representative high school laboratories. Prerequisite: Same as 142-412.

450. INDUSTRIAL PLASTICS 3 hours
A general overview of the plastics and synthetics industries. The course examines the processes; the associated application of procedures, materials, equipment and current practices of the industry. Laboratory experiments and production projects are required.

451. AUTOMOTIVE, ENERGY, AND POWER MECHANICS 3 hours

460. MANUFACTURING, MATERIALS AND PROCESSES 5 hours
A study of the basic concepts of materials science. Electrical, electronic, chemical and mechanical properties of materials, metals, organic materials. The manufacturing processes involved in industrial production; classroom
discussions, technical motion pictures, and field trips to refineries, mines, quarries, mills, kilns, foundries, factories and other manufacturing firms.

480. STUDENT TEACHING IN INDUSTRIAL ARTS EDUCATION  
See Education 480.

484. INTERNSHIP IN INDUSTRIAL TECHNOLOGY  
1-8 hours

490. SPECIAL TOPICS IN INDUSTRIAL TECHNOLOGY  
1-3 hours

494. SEMINAR IN INDUSTRIAL TECHNOLOGY  
1-3 hours

497. INDEPENDENT STUDY IN INDUSTRIAL TECHNOLOGY  
1-3 hours

MATHEMATICS AND COMPUTER SCIENCE  
(Department 123)

Professor Berton; Associate Professors R. Evans, Hovis (Chairman), Lhamon, Spielman; Assistant Professors John Riley, Shult; Instructors Klang, O'Dell, Retterer; Visiting Instructor C. Lobenhofer; Lecturers Ludanyi, Joyce Riley, N. Theye.

The department offers courses in mathematics, statistics, and computer science to complement almost all disciplines in the University. Students should check the department curriculum in which they are considering a major to determine the best choice of courses in Mathematics and Computer Science.

In general, the sequence 100-172-173 is designed for prospective elementary school teachers. 142-143 is designed for social science and business students, 154-155-156 is designed for life science students, and the sequence 162-261-262-263-264 is designed for students in engineering, physical science, mathematics, and computer science. Mathematics 161-162 are courses designed for students desiring pre-calculus preparation. Students who want an introduction to computer programming should consider BASIC (CS 111) which is of general interest, FORTRAN (CS 131) which is primarily used in scientific applications, and COBOL (CS 231) which is used in business applications.

The department offers a Bachelor of Arts degree in Mathematics and both a Bachelor of Arts and a Bachelor of Science degree in Computer Science. In addition, the department offers minors in both mathematics and computer science. All courses in the department which are to be counted toward a major or a minor must be completed with a grade of C or better.

MATHEMATICS

For the mathematics major, the student must complete the calculus sequence 163-261-262-263-264 and at least 25 credit hours in mathematics courses at the 300/400 level. These selections must include 311, 361, and 452. For a minor in mathematics, the student must complete 163-261-262-263 and at least 13 additional hours in mathematics numbered 264 or higher.
Students planning to pursue a graduate degree in mathematics should also take 312, 313, 324, 363, and 453. Students interested in a career in the actuarial sciences should take, in addition to the calculus sequence, 111, 131, 332, 381, 382, 461, and 462, as well as 131, 132, 133, 202, 203 and 462 from the College of Business Administration.

**COMPUTER SCIENCE**

For the computer science major, the student must complete 111, 131, 132, 234, 236, 238, 330, 334, 338, and 461. In addition, the student must complete a senior project (430) for 4 hours credit and 6 hours of electives in computer science at the 300/400 level. The following mathematics courses are also required of the computer science major: 163, 261, 262, 263, 336, and either 142-143 or 381-382. For the Bachelor of Science degree, the student must complete an additional 18 hours in the Division of Mathematical and Natural Sciences and/or The College of Engineering. These 18 hours must be beyond what is required to meet the general education requirements for the Bachelor of Science degree. For a minor in computer science, the student must complete 131, 132, 234, 236, 238, and at least 10 additional hours in computer science with at least 6 hours at the 300-400 level.

**COMPUTER SCIENCE**

**000. ORIENTATION**
1 hour
Familiarization with the department, requirements for majors, planning programs of study, university catalog and library. Required of departmental majors. Also listed as Mathematics 000.

**111. PROGRAMMING IN BASIC**
2 hours
An introduction to computer programming using the BASIC language. Not open for credit to students who have completed Computer Science 130.

**130. BUSINESS INFORMATION PROCESSING**
4 hours
An introduction to computer systems, computer applications in business, system design and analysis, and computer programming in BASIC. Not open for credit to students who have completed Computer Science 111 or Accounting 433.

**131. INTRODUCTION TO FORTRAN**
4 hours
An introduction to problem solving and algorithm development. Design, code (FORTRAN), debug, and document programs using techniques of good programming style.

**132. INTERMEDIATE PROGRAMMING**
4 hours
Continued development of structured programming techniques, and introduction to basic aspects of string processing, internal search/sort methods, and simple data structures. A second high level programming language is introduced. Prerequisite: Computer Science 131 or its equivalent.
231. INTRODUCTION TO COBOL  4 hours
An introduction to programming in COBOL with business application.

234. ASSEMBLY LANGUAGE PROGRAMMING  4 hours
An introduction to computer structure and machine language, assembly lan-
guage programming, macros, program segmentation and linkage. Prerequi-
site: Computer Science 132.

236. INTRODUCTION TO COMPUTER ORGANIZATION  4 hours
Basic logic design, introduction to computer architecture. Prerequisite: Com-
puter Science 132.

238. INTRODUCTION TO FILE PROCESSING  4 hours
An introduction to the file processing environment, sequential access and
direct access file manipulation techniques. Prerequisite: Computer Science
132.

330. ORGANIZATION OF PROGRAMMING LANGUAGES  4 hours
Programming language constructs emphasizing the run-time behavior of pro-
grams. Prerequisite: Computer Science 234 and 238.

332. OPERATIONS RESEARCH  3 hours
Linear programming model, simplex method and algorithms, primal and dual
problem, sensitivity analysis, transportation, transshipment, assignment,
shortest route, minimal spanning tree, maximal flow, PERT. Applications il-
lustrating optimal decision making in deterministic systems. Also listed as
Mathematics 332. Prerequisite: Computer Science 111.

334. OPERATING SYSTEMS AND COMPUTER
ARCHITECTURE 1  4 hours
Operating system principles. Organization and architecture of computer
systems at the register-transfer and programming levels of system develop-
ment. Prerequisite: Computer Science 234 and 236.

335. OPERATING SYSTEMS AND COMPUTER
ARCHITECTURE 2  4 hours
Continuation of 334.

338. DATA STRUCTURES AND ALGORITHM ANALYSIS  4 hours
Basic techniques for the design and analysis of efficient algorithms for sorting,
merging, searching and memory management. Prerequisite: Computer Sci-
eence 238.

430. SENIOR PROJECT IN COMPUTER SCIENCE  4 hours
An applications project conducted by student teams. Students will be re-
sponsible for the definition, design, and implementation of a software proj-
et. Students doing an off-campus project will be graded S-U.

461. NUMERICAL ANALYSIS 1  3 hours
Solutions of equations in one variable, interpolation and polynomial ap-
proximation, direct methods for solving linear systems. Prerequisite: Mathematics 263 and Computer Science 131.

462. NUMERICAL ANALYSIS 2 3 hours
Numerical differentiation and integration, initial value problems for ordinary differential equations. Iterative techniques in matrix algebra. Prerequisite: Computer Science 461 and Mathematics 361.

470. COMPUTER SCIENCE INTERNSHIP 3-12 hours
Analysis, design coding, or testing of a software project. Normally achieved off-campus working for an industrial organization or government agency. Open to computer science majors who have completed eight quarters of work and have junior standing.

491. SPECIAL TOPICS IN COMPUTER SCIENCE 1-4 hours

495. SEMINAR IN COMPUTER SCIENCE 1-4 hours

498. INDEPENDENT STUDY IN COMPUTER SCIENCE 1-3 hours

MATHEMATICS

000. ORIENTATION 1 hour
Familiarization with the department, requirements for majors, planning programs of study, university catalog and library. Required of departmental majors.

100. MATHEMATICS 3 hours
An examination of basic mathematical concepts and their applications. Mathematics 142, 154 or 163 may be taken in place of Mathematics 100 to fulfill the general education requirement in Mathematics. Not open to students who have received a C or higher in mathematics courses numbered 142 or higher.

142. PROBABILITY AND STATISTICS 1 3 hours
Descriptive statistics, probability, binomial distribution, normal distribution, confidence intervals, hypothesis testing. Prerequisite: Mathematics 161 or its equivalent in high school work.

143. PROBABILITY AND STATISTICS 2 3 hours
Regression and correlation, probability, Bayes Theorem, Chi-Square test for independence, analysis of variance. Prerequisite: Mathematics 142.

154. CALCULUS AND PROBABILITY 1 4 hours
Differential and integral calculus involving algebraic, logarithmic and exponential functions and its application including a basic study of probability theory. Prerequisite: Mathematics 161 or its equivalent in high school work.

155. CALCULUS AND PROBABILITY 2 4 hours
Continuation of 154.
156. INTRODUCTORY DATA ANALYSIS  
Basic statistical techniques with emphasis on the applications to biological sciences. Prerequisite: Mathematics 154-155 or its equivalent.

161. ELEMENTARY FUNCTIONS 1  
The real number system, functions, theory of polynomial equations, systems of equations, and inequalities. Not open for credit to students who have completed a calculus course.

162. ELEMENTARY FUNCTIONS 2  
Trigonometric functions, trigonometric identities and formulas, solutions of triangles, and complex numbers. Not open for credit to students who have completed Mathematics 261. Prerequisite: Mathematics 161 or its equivalent in high school work.

163. CALCULUS 1  
Rate of change of a function, slope of a curve, limits, derivatives of algebraic functions, chain rule, continuity, related rates, curve plotting, extrema, mean value theorem, and applications. Prerequisite: Mathematics 162 or its equivalent in high school work.

172. FUNDAMENTAL MATHEMATICS 1  
Theory of arithmetic, systems of numeration, relations, algorithms, whole numbers, integers, rational numbers, real numbers, patterns of proof. Open for credit only to elementary education majors. Prerequisite: Mathematics 100.

173. FUNDAMENTAL MATHEMATICS 2  
Geometric figures, transformations on the plane, congruences of geometric figures, symmetry, similarity. Open for credit only to elementary education majors. Prerequisite: Mathematics 100.

245. HISTORY OF MATHEMATICS  
An introduction to the history and origin of mathematics, restricted principally to mathematics through elementary calculus, a chronological study of some mathematicians and their contributions to mathematical thought. To be offered alternate years, 1982-83.

261. CALCULUS 2  
Integration, fundamental theorem, integration techniques, application of integration, polar coordinates, integral estimation. Prerequisite: Mathematics 163.

262. CALCULUS 3  
Further applications of the derivative, partial derivatives, double integration, vectors. Prerequisite: Mathematics 261.

263. CALCULUS 4  
Series, Taylor series, multiple integration, linear algebra. Prerequisite: Mathematics 262.
264. CALCULUS 5 3 hours
Vector calculus, line integrals, Green's Theorem, Stokes' Theorem. Prerequisite: Mathematics 263.

290. SPECIAL TOPICS IN MATHEMATICS 1-3 hours

291. CALCULUS THEORY SEMINAR 1 1 hour
A theoretical treatment of the calculus to be taken concurrently with 263, 264, 361. A rigorous treatment of convergence, continuity, limits, and integration through the fundamental theorem of calculus. Prerequisite: Mathematics 261.

292. CALCULUS THEORY SEMINAR 2 1 hour
Continuation of 291.

293. CALCULUS THEORY SEMINAR 3 1 hour
Continuation of 292.

311. ABSTRACT ALGEBRA 1 3 hours
A study of algebraic structures. Groups, rings, fields. To be offered alternate years, 1982-83. Prerequisite: Mathematics 263.

312. ABSTRACT ALGEBRA 2 3 hours
Continuation of 311.

313. LINEAR ALGEBRA 3 hours
Matrix theory, determinants, systems of linear equations, eigenvalues and eigenvectors, vector spaces. To be offered in alternate years, 1982-83. Prerequisite: Mathematics 263.

324. TOPOLOGY 3 hours
General point set topology and metric spaces. To be offered alternate years, 1983-84. Prerequisite: Mathematics 264.

332. OPERATIONS RESEARCH 3 hours
Linear programming model, simplex method and algorithms, primal and dual problem, sensitivity analysis, transportation, transshipment, assignment, shortest route, minimal spanning tree, maximal flow, PERT. Applications illustrating optimal decision making in deterministic systems. Prerequisite: Computer Science 111.

336. DISCRETE MATHEMATICS 4 hours
Introduction to combinatorics, graph theory, network flows, enumeration techniques, sorting and searching. Prerequisite: Computer Science 132 and Mathematics 261 or 155.

361. DIFFERENTIAL EQUATIONS 5 hours
First order differential equations with applications, second order linear differential equations with applications. Laplace transforms, systems of first order equations. Prerequisite: Mathematics 263.
362. PARTIAL DIFFERENTIAL EQUATIONS 4 hours

363. COMPLEX VARIABLES 4 hours
Complex algebra, complex calculus, analytic functions, infinite series over the complex plane, theory of residues, conformal mapping. To be offered alternate years, 1982-83. Prerequisite: Mathematics 264.

381. STATISTICS 1 3 hours
Probability models, random variables, sampling estimation, testing hypothesis, non-parametric procedures, regression, and correlation. To be offered in alternate years, 1982-83. Prerequisite: Mathematics 263.

382. STATISTICS 2 3 hours
Continuation of 381.

390. SPECIAL TOPICS IN MATHEMATICS 1-3 hours

421. FOUNDATIONS OF GEOMETRY 1 3 hours
Incidence, ordering, separation and congruence, as they are involved in non-Euclidean incidence, affine and Euclidean geometries. To be offered alternate years, 1983-84. Prerequisite: Mathematics 263.

422. FOUNDATIONS OF GEOMETRY 2 3 hours
Continuation of 421.

423. PROJECTIVE GEOMETRY 3 hours
Projectivities, perspectivities, perspective triangles, quadrangular sets, harmonic sets, duality, fundamental theorem and Pappus' Theorem, polarities, the conic, finite projective plane, parallelism, coordinates. To be offered alternate years, 1983-84. Prerequisite: Mathematics 263.

452. REAL ANALYSIS 1 3 hours
Basic set theory. The algebraic (vector space) and topological (norm) properties of real Cartesian spaces. Sequences. Offered alternate years 1983-84.

453. REAL ANALYSIS 2 3 hours

461. NUMERICAL ANALYSIS 1 3 hours
Solutions of equations in one variable, interpolation and polynomial approximation, direct methods for solving linear systems. Prerequisite: Mathematics 263 and Computer Science 131. Offered alternate years 1982-83.

462. NUMERICAL ANALYSIS 2 3 hours
Numerical differentiation and integration, initial value problems for ordinary
differential equations. Iterative techniques in matrix algebra. Prerequisite: Mathematics 461 and 361. Offered alternate years 1982-83.

490. SPECIAL TOPICS IN MATHEMATICS 1-3 hours

494. SEMINAR IN MATHEMATICS 1-3 hours

497. INDEPENDENT STUDY IN MATHEMATICS 1-3 hours

MUSIC
(Department 152)

Professors Drake (Chairman), Sonntag; Associate Professor E. Williams; Assistant Professor Kratzer; Instructors Gray, Svendsen; Lecturers Blair, Hill, Kuehn, D. Lenssen, R. Williams.

The Department of Music offers a full course of music and music education studies for the aspiring music educator or professional performer. The department also serves the general university community through its course offerings, its performing groups which are open to all students, and through its many concerts, recitals, and other performances which enhance the cultural life and atmosphere of the university. Ohio Northern University is a full member of the National Association of Schools of Music.

The music major is given a variety of courses and experiences to help him gain the knowledge and proficiency in breadth and depth which will help him achieve future success in his chosen area of endeavor in the music field. Special topics and studies may be undertaken to enrich the basic course offerings.

A variety of degree programs are offered: Bachelor of Music with majors in music education, performance, and sacred music and Bachelor of Arts with a major or minor in music. Specific degree requirements are listed below.

BACHELOR OF MUSIC—All majors include a basic musicality core of courses 101, 121, 122, 123, 131, 132, 133, 221, 222, 223, 231, 232, 233, 241, 242, 331, 312, 313, 321, 322, 323, and 341. Vocal majors also take diction 261, 262, 263. The College of Arts and Sciences in-depth courses requirements are not required for the Bachelor of Music degrees. A minimum of one major performing group is taken each quarter. Regular student recital performances and participation in performing group concerts provide continuous growth in musicianship. Special requirements for the individual majors within the Bachelor of Music are as follows.

The Bachelor of Music in Music Education requires 22 hours of applied private instruction, proficiency in piano and classroom instruments; senior recital; music education courses 043, 336, 338, 339, 361, 461, and 462 (instrumental majors also take 463); and professional education courses 111, 223, 224, 250 or 251, 342, 370, 380, student teaching (one quarter), and field experience.

The Bachelor of Music in Performance requires an acceptance audition, piano proficiency, 36 hours of applied private instruction, applied field
literature, ensemble, music electives, and junior and senior recitals.

The Bachelor of Music in Sacred Music requires 36 hours of applied instruction in organ and voice; music 245, 345, 445; senior recital; and 15 hours of religion courses.

BACHELOR OF ARTS—The major in music requires a minimum of 51 hours which must include music courses 121, 122, 123, 131, 132, 133, 221, 222, 223, 231, 232, 233, 321, 322, 323; a minimum of 12 hours of private applied instruction well distributed over the college years; a minimum of 6 quarters in a major performing group; and a senior project (with or without credit).

A minor in music may be earned by taking a minimum of 33 hours which must include music 121, 122, 123, 131, 132, 133, 321, 322, 323; 6 quarters of private applied instruction in one area and 6 quarters in a major performing group.

All music majors are required to attend a specified number of recitals and concerts each quarter, registering for Music 001.

The advanced music section of the Graduate Record Examination (GRE) is the required senior comprehensive examination for all music majors.

Teacher certification in music, vocal and instrumental, K-12, is acquired through the Bachelor of Music in Music Education. However, students on other programs may elect to fulfill requirements for music K-12, 7-12, or K-6 in addition to their regular curricula. Contact the department chair for specific requirements.

Double majors in music and another field, prelaw programs with music majors, inter-disciplinary programs, or double degree programs can be arranged. Contact the department chair for details.

APPLIED MUSIC

Each music major generally takes two credit hours of individual instruction in his major applied area each quarter. Non-music majors and music majors studying minor applied areas usually register for one credit hour of class or individual instruction each quarter. Non-music majors are assessed an extra fee only for individual lessons, and the availability of these lessons is dependent upon the schedule and load of the instructor involved.

10. Voice—Class
15. Voice—Individual
20. Piano—Class
21. Piano—Class (Majors)
25. Piano—Individual
30. Organ—Class
35. Organ—Individual
40. Strings—Class
41. Violin-Viola—Class
42. Cello-Bass—Class
43. Classroom Instruments—Class
44. Intermediate Guitar—Class

45. Violin—Individual
46. Viola—Individual
47. Cello—Individual
48. Double Bass—Individual
49. Guitar—Individual
50. Woodwinds—Class
55. Flute—Individual
56. Oboe—Individual
57. Clarinet—Individual
58. Bassoon—Individual
59. Saxophone—Individual
60. Brasses—Class
65. Trumpet—Individual
66. French Horn—Individual
67. Trombone—Individual
68. Euphonium—Individual
69. Tuba—Individual
70. Percussion—Class
75. Percussion—Individual

(Note: 1) All class instruction carries one hour credit per quarter. The amount of instruction depends upon the size of the class, but is not less than one-half nor more than two class hours per week.
(2) Individual instruction is offered for varying hours of credit. The section number will determine the number of hours credit. Usually, two hours for majors and one hour for minors are taken. Generally, one half hour of individual instruction is given for each hour of credit taken.

MUSIC PERFORMING GROUPS
Membership in performing groups is open to all University students, and they are encouraged to participate. Students may enroll as many times as they wish; however, there are certain restrictions on the amount of ensemble credit which may count toward minimal graduation requirements in the College of Arts and Sciences. In-depth requirements in fine arts may be satisfied by two to four years of membership in a major performing group.

080. CHORUS
A large choral group open to all qualified students. Music of all types, accompanied and a cappella, is studied and sung throughout the year in concerts and performances on and off campus.

081. CHAPEL CHOIR
A choral group open to all students for the study and performance of sacred and traditional music. The Chapel Choir sings at chapel services and gives occasional concerts.

082. VOCAL ENSEMBLE
Selected ensembles of vocalists for the study and performance of characteristic literature. Membership by audition.

083. UNIVERSITY SINGERS
A select group of men and women singers designed to perform a wide variety of choral literature with the highest musical standards. Performances include concerts and programs on and off campus and on tour. Membership by audition.

084. CONCERT BAND
A concert ensemble open to all qualified students who play band instruments. A wide variety of band literature is studied and performed in regular campus concerts.

086. PEP BAND
A band specially organized to provide music for athletic events.
087. SYMPHONIC BAND 1 hour
A select, fully-instrumented concert ensemble studying and performing the finest band literature with the highest musical standards. Performances include concerts and programs on campus and tour concerts.

088. JAZZ ENSEMBLE 1 hour
Selected ensembles for the study and performance of jazz and popular music. Performances on and off campus are scheduled throughout the year, including the annual jazz festival. Membership priority is given to members of symphonic and concert bands.

090. MARCHING BAND 1 hour
A musical organization devoted to the preparation and performance of football game shows at home and selected away games. Open to all university students who play band instruments or who are accepted for auxiliary groups. Fall Quarter only. Includes a drill camp in advance of the Fall Quarter.

092. WOODWIND ENSEMBLE 1 hour
Selected ensembles of woodwind instrumentalists for the study and performance of characteristic literature.

094. BRASS ENSEMBLE 1 hour
Selected ensembles of brass instrumentalists for the study and performance of characteristic literature.

095. PERCUSSION ENSEMBLE 1 hour
Selected ensembles of percussion players for the study and performance of characteristic literature.

096. ORCHESTRA 1 hour
Credit may be earned for membership in the Lima Symphony Orchestra (by audition) and for orchestras on campus which perform for large choral works and the annual spring musical theater production.

098. STRING ENSEMBLE 1 hour
Ensembles of string instrumentalists for the study and performance of characteristic literature.

COURSES IN MUSIC

000. ORIENTATION 1 hour
Familiarization with the department, requirements for majors, planning programs of courses, university catalog and library. Required of departmental majors.

001. CONCERT AND RECITAL OBSERVATION 0 hours
A selected number of concerts and recitals to be attended each quarter. Required of all full-time music majors. Graded S-U.
100. MUSIC 3 hours
A basic course in the nature, forms, styles, and media of music of all types and periods. Emphasis upon listening and understanding. Laboratory listening and concert attendance, knowledge of fundamentals, recognition of composers and representative literature expected.

101. MUSIC 3 hours
The basic music 100 course for music majors only.

110. FUNDAMENTALS OF MUSIC FOR THE NON-MUSIC MAJOR 3 hours
A basic course in the theory of music designed to give the non-music major a background in the perception and reading of musical symbols. Especially recommended for elementary education majors.

112. MUSIC FOR THE CLASSROOM TEACHER 3 hours
Music activities, materials, literature, unit planning, teaching methods and skills for the classroom teacher, grades K-6. Prerequisite: Music 100.

121. THEORY OF MUSIC 3 hours
Basic music theory and harmony, scales, intervals, chords, part-writing, creative projects in composition and arranging. Required of all freshmen music majors. Continuation courses must be taken in sequence.

122. THEORY OF MUSIC 3 hours
Continuation of 121.

123. THEORY OF MUSIC 3 hours
Continuation of 122.

131. EAR TRAINING 1 hour
Sight-singing; melodic, rhythmic and harmonic dictation; keyboard harmony. Taught in a laboratory setting. Designed to supplement and to be taken in conjunction with first year of music theory studies. Must be taken in sequence. Level determined by proficiency.

132. EAR TRAINING 1 hour
Continuation of 131.

133. EAR TRAINING 1 hour
Continuation of 132.

210. JAZZ HISTORY AND LITERATURE 3 hours
An in-depth study of modern jazz, from its roots in African tribal music through the gradual evolution of this American art form as it appears today.

221. ADVANCED THEORY OF MUSIC 4 hours
Continuation of Music 123. Study of 18th, 19th and 20th century compositional techniques. Development of analytical skills. Creative projects in composition. Continuation courses must be taken in sequence. Prerequisite: Music 123.
222. ADVANCED THEORY OF MUSIC
Continuation of 221. 4 hours

223. ADVANCED THEORY OF MUSIC
Continuation of 222. 4 hours

231. ADVANCED EAR TRAINING
Continuation of Ear Training 131-132-133. Designed to supplement and to be taken in conjunction with second year of music theory. Prerequisite: Ear Training 133 or proficiency. 1 hour

232. ADVANCED EAR TRAINING
Continuation of 231. 1 hour

233. ADVANCED EAR TRAINING
Continuation of 232. 1 hour

241. BASIC CONDUCTING I
General conducting techniques and principles of score study. Laboratory experiences. Continuation courses must be taken in sequence. Prerequisite: Music 121. (Formerly Music 421). 1 hour

242. BASIC CONDUCTING II
Continuation of 241. 1 hour

245. HISTORY OF SACRED MUSIC
A history of the sacred music of the Judeo-Christian tradition, both for congregation and for trained voices, with special emphasis on developments in this century. 3 hours

261. LATIN AND ITALIAN DICTION FOR SINGERS
A course designed to acquaint vocalists with the proper pronunciation of vocal and choral texts in Latin and Italian. Required of all vocal music majors. 1 hour

262. FRENCH DICTION FOR SINGERS
Continuation of 261 in French. 1 hour

263. GERMAN DICTION FOR SINGERS
Continuation of 261-262 in German. 1 hour

310. AMERICAN MUSIC
An investigation of sacred and secular American music from colonial America to the present with particular attention to native art music and the incorporation of jazz into symphonic works of the 20th century. 3 hours

311. COUNTERPOINT
A study of polyphonic music in various styles with particular emphasis on that of the eighteenth century. Creative projects in contrapuntal writing. Prerequisite: Music 223. 2 hours
312. FORM AND ANALYSIS  2 hours
A study of the evolution of musical forms and styles from the Baroque to the present. Theoretical and stylistic analysis of representative music. Prerequisite: Music 223.

313. ORCHESTRATION  2 hours
A study of the instruments of the band and orchestra. Arrangements for the band and orchestra. Arrangements for string, woodwind and brass combinations. A study of orchestrations by romantic, classical, and modern composers. Prerequisite: Music 223.

321. MUSIC HISTORY AND LITERATURE  3 hours
The historical development of music literature. Study of representative literature and composers: Ancient, Medieval and Renaissance periods. Prerequisite: Music 100.

322. MUSIC HISTORY AND LITERATURE  3 hours
Study of the Baroque and Classical periods. Prerequisite: Music 100.

323. MUSIC HISTORY AND LITERATURE  3 hours
Study of the Romantic and Twentieth Century periods. Prerequisite: Music 100.

334. WOODWIND METHODS  2 hours
Study, elementary performance skills, pedagogy, and materials of the woodwind instruments. For future school music teachers.

336. BRASS METHODS  2 hours
Study, elementary performance skills, pedagogy, and materials of the brass instruments. For future school music teachers.

338. PERCUSSION METHODS  2 hours
Study, elementary performance skills, pedagogy, and materials of the percussion instruments. For future school music teachers.

339. STRING METHODS  2 hours
Study, elementary performance skills, pedagogy, and materials of the orchestral stringed instruments. For future school music teachers.

341. ADVANCED CONDUCTING  2 hours
Conducting and rehearsal techniques related to instrumental and choral ensemble music. Score study and practical application through laboratory experiences. Prerequisites: Music 123 and 242. (Formerly 152-422 and 423).

345. CHOIR MANAGEMENT AND TRAINING  3 hours
The training and management of church choirs including youth choirs, handbell choirs, and administration of the total church music program.

361. ELEMENTARY MUSIC METHODS (MUSIC EDUCATION MAJORS)  3 hours
Philosophy, techniques, materials, curriculum planning for the elementary music teacher and supervisor.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>371</td>
<td><strong>APPLIED FIELD LITERATURE</strong></td>
<td>1 hour</td>
<td>Study of the professional and educational literature in a specific applied field.</td>
</tr>
<tr>
<td>372</td>
<td><strong>APPLIED FIELD LITERATURE</strong></td>
<td>1 hour</td>
<td>Continuation of 371.</td>
</tr>
<tr>
<td>373</td>
<td><strong>APPLIED FIELD LITERATURE</strong></td>
<td>1 hour</td>
<td>Continuation of 372.</td>
</tr>
<tr>
<td>380</td>
<td><strong>JUNIOR RECITAL</strong></td>
<td>0 hours</td>
<td></td>
</tr>
<tr>
<td>445</td>
<td><strong>SERVICE PLAYING</strong></td>
<td>3 hours</td>
<td>Instruction in the playing for church services, accompaniment of anthems, and conducting from the console.</td>
</tr>
<tr>
<td>461</td>
<td><strong>SECONDARY CHORAL METHODS AND TECHNIQUES</strong></td>
<td>3 hours</td>
<td>Procedures in the development and direction of school choral groups, including choral literature of all types.</td>
</tr>
<tr>
<td>462</td>
<td><strong>SECONDARY INSTRUMENTAL METHODS AND TECHNIQUES</strong></td>
<td>3 hours</td>
<td>Procedures in the development and direction of school bands and orchestras, including band literature of all types.</td>
</tr>
<tr>
<td>463</td>
<td><strong>MARCHING BAND METHODS AND TECHNIQUES</strong></td>
<td>2 hours</td>
<td>Methods, materials, and techniques in the development and direction of the marching band. Show planning, precision drill, rehearsal techniques, and selection and rehearsal of music. Membership in Marching Band required in conjunction with class.</td>
</tr>
<tr>
<td>480</td>
<td><strong>SENIOR RECITAL</strong></td>
<td>0 hours</td>
<td></td>
</tr>
<tr>
<td>490</td>
<td><strong>SPECIAL TOPICS IN MUSIC</strong></td>
<td>1-3 hours</td>
<td>Group study of approved specialized topics not offered in catalog.</td>
</tr>
<tr>
<td>497</td>
<td><strong>INDEPENDENT STUDY IN MUSIC</strong></td>
<td>1-3 hours</td>
<td>A wide variety of specialized musical subjects are available through individual study with a faculty member.</td>
</tr>
</tbody>
</table>
PHILOSOPHY AND RELIGION  
(Department 115)  

Professors Hinderliter (Chairman), R. Benson (On Leave, 1981-82); Associate Professor Barrick; Assistant Professors Close, M. Lenssen.

The orientation of the department is non-sectarian and reflects a serious commitment to the academic study of philosophy and religion within the liberal arts tradition. Recognizing that both philosophy and religion, as academic disciplines, are concerned with basic questions of meaning and value in human life and with historical approaches to those questions, the department offers a range of general and specialized courses designed to broaden the educational experience of all undergraduate students at Ohio Northern. Students wishing a more concentrated study of philosophy and religion may choose to major or minor in the department.

DEPARTMENTAL PROGRAMS

PHILOSOPHY MAJOR
The major in philosophy requires a minimum of 45 quarter hours, including the following courses: 234, two of the following (100, 237, 238), two courses in the History of Philosophy (331, 343, 347, 348, 349, 350), and either 494 or 497. For Philosophy 100 to count as a part of the major, it must be taken before Philosophy 237 or Philosophy 238. A maximum of three courses in religion may be applied to the philosophy major. A senior comprehensive exam is not required.

RELIGION MAJOR
The major in religion requires a minimum of 45 quarter hours beyond religion 105 and must include either seminar 495 or independent study 498. A maximum of three courses in philosophy may be applied towards the religion major. A senior comprehensive exam is not required.

PHILOSOPHY AND RELIGION MAJOR
The major in philosophy and religion requires a minimum of 45 quarter hours beyond philosophy 100 and religion 105, with the selection of courses subject to approval by the department. A senior comprehensive exam is not required.

It is recommended that majors in the department who plan to attend theological seminary or graduate school take two years of foreign language.

MINOR PROGRAMS
Minors are offered in philosophy and religion. A minimum of 30 hours is required with the selection of courses subject to approval by the department. Contact the department chairman for further information about these programs.
PRELAW PROGRAM
The department cooperates with the Pettit College of Law in the “guaranteed admission” prelaw program (see elsewhere in this catalog). Information about the curricular requirements of the program can be secured from the department chairman.

PHILOSOPHY
Philosophy is a quest for a comprehensive understanding of human existence. The objective of philosophy is to consider the rational justification of logical inferences, human values, criteria for establishing the claims of knowledge and certainty, and interpretations of the nature of reality. The diverse insights of significant philosophers from ancient times to the present contribute resources to stimulate contemporary philosophical thinking in each of these areas.

A major in philosophy prepares students generally for careers in areas which require the ability to analyze problems and to think and write clearly. It is an appropriate major for students planning to continue their education for professional careers such as law, medicine, and theology.

000. ORIENTATION 1 hour
Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Also listed as Religion 000. Required of departmental majors. Philosophy 234, 237 or 238 can be taken in place of Philosophy 100 to fulfill the general education requirement in philosophy.

100. PHILOSOPHY 3 hours
An introduction to philosophical inquiry, its scope and methodology, through a study of representative philosophical problems such as the nature of ethical values, principles of correct reasoning, the possibility and limits of knowledge, and the distinction between appearance and reality.

210. DEATH AND DYING 3 hours
An exploration of the experience and meaning of death. Emphasis on choices and decisions related to dying that involve medical treatment, aging, grief, institutional care, and social policy.

234. LOGIC 3 hours
The study of logical fallacies and the principles of correct reasoning. The application of formal logical analysis to arguments encountered in ordinary language.

237. KNOWLEDGE AND TRUTH 3 hours
An examination of the scope and justification of knowledge with reference to problems such as skepticism, sense perception, reason, belief, and truth. Prerequisite: Philosophy 100 or sophomore standing.

238. ETHICS 3 hours
An examination of selected ethical theories and their rational justification.
The use of ethical theories for resolving ethical issues in personal and social decision-making. Prerequisite: philosophy 100 or sophomore standing.

Most of the following courses are offered in alternate years or on demand. Prerequisites for all 300 and 400 level courses: one course in philosophy or consent of the instructor.

290. SPECIAL TOPICS IN PHILOSOPHY 1-3 hours

294. SEMINAR IN PHILOSOPHY 1-3 hours

320. SOCIAL JUSTICE 3 hours
Theories of justice in contemporary society including conceptions of the law, human rights, equality, liberty, and responsibility. (Formerly 438)

325. PHILOSOPHY OF RELIGION 3 hours
Critical inquiry into issues such as the nature and existence of God, the problem of evil, the significance of religious experience, the justification of religious belief, the relation of faith and reason. (Formerly 452) Also listed as religion 325.

331. PLATO AND ARISTOTLE 3 hours
A study of the Greek philosophers, Plato and Aristotle, against the background of the Pre-Socratics and Socrates.

334. SYMBOLIC LOGIC 3 hours
The evaluation of deductive arguments by means of the formal procedures of modern symbolic logic. Prerequisite: Logic 234.

338. BIOETHICS 3 hours
Ethical issues involving personal and social values in matters of life and death, such as experimentation with human subjects, genetic control, abortion, and patients’ rights to receive and refuse treatment.

341. AESTHETICS 3 hours
An examination of classical and contemporary theories of art and aesthetic experience. Consideration of the nature of various arts and issues such as meaning, truth, and value in art.

343. AMERICAN PHILOSOPHY 3 hours
(Formerly 444,445). Main currents in American philosophy, including representative thinkers in such traditions as Puritanism, Transcendentalism, Pragmatism, and Realism. Prerequisite: one course in the history of philosophy or consent of instructor.

345. EXISTENTIALISM 3 hours
The historical roots of existentialism in Kierkegaard and Nietzsche, and the thought of representative writers such as Heidegger, Sartre, Marcel, Camus, Dostoyevsky, and Kafka.
347. MEDIEVAL THOUGHT
The development of theological and philosophical thought from 500 A.D. to 1350 A.D. Also listed as Religion 347.

348. RENAISSANCE TO RATIONALISM
The history of philosophy from the Renaissance through the thought of Bacon, Hobbes, and the Continental Rationalists. Prerequisite: one course in the history of philosophy or consent of instructor.

349. EMPIRICISM AND ENLIGHTENMENT
Seventeenth and eighteenth-century philosophies from Locke to Kant which influenced subsequent Western life and thought. Prerequisite: one course in the history of philosophy or consent of instructor.

350. NINETEENTH CENTURY PHILOSOPHY
The history of philosophy from Kant to Nietzsche, including the thought of Hegel, the spirit of Romanticism, and the scientific approaches of such thinkers as Mill, Darwin, and Marx. Prerequisite: one course in the history of philosophy or consent of instructor.

490. SPECIAL TOPICS IN PHILOSOPHY
1-3 hours

494. SEMINAR IN PHILOSOPHY
1-3 hours

497. INDEPENDENT STUDY IN PHILOSOPHY
1-3 hours
Departmental permission required.

RELIGION
Religion is an integral part of human life and culture. It includes the ultimate commitments, attitudes, beliefs and forms of worship by which people live and find meaning for their personal and social existence. The courses in religion are intended to acquaint the student with the living religious traditions, primarily of the West, through an examination of their origins and development, their interaction with the changing cultural context, and their insights for dealing with the perennial questions of human existence and destiny. The approach to the study is ecumenical and makes use of current scholarly methods of research and findings.

000. ORIENTATION
Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Also listed as Philosophy 000. Required of departmental majors.

Religion 105, 106, 107 or 108 can be taken to fulfill the general education requirement in religion.

105. RELIGION
An exploration of the religious dimension of man's search for personal identity, meaningful existence, and ultimate reality, through the examination of various aspects and expressions of the religious life of mankind.
106. INTRODUCTION TO THE BIBLE 3 hours
An introduction to the Old and New Testaments, with special emphasis on the origin, history, and message of the biblical writings, and the central personalities, events, and ideas which form the basis of the Judeo-Christian tradition.

107. RELIGIONS EAST AND WEST 3 hours
An introduction to representative major religions of the world, their origins, sacred writings, basic beliefs, and life practices, with special attention to non-Western religious traditions.

108. INTRODUCTION TO CHRISTIANITY 3 hours
A study of the major teachings, practices and institutional forms of Christianity in their historical and contemporary settings.

Most of the following courses are offered in alternate years or on demand.

254. THE OLD TESTAMENT AND ANCIENT ISRAEL 3 hours
A critical examination of the Old Testament in the context of the history, life, and culture of ancient Israel. Prerequisite: Religion 106 or consent of the instructor.

256. THE NEW TESTAMENT AND THE BEGINNINGS OF CHRISTIANITY 3 hours
A critical examination of the New Testament and of the early Christian movement. Prerequisite: Religion 106 or consent of the instructor.

261. ARCHAEOLOGY AND THE BIBLE 3 hours
The methods and conclusions of archaeological studies in the Middle East as related to the Bible.

262. CHRISTIANITY AND CULTURE 3 hours
An examination of various interpretations of the relationship of Christianity to particular cultural phenomena, including literature, science, philosophy, psychology and the economic and political orders.

263. CHRISTIAN ETHICS 3 hours
The relation of biblical and theological thought to the development of ethical principles. Application to personal and social moral issues, such as marriage, family, race, politico-economic life, international affairs.

291. SPECIAL TOPICS IN RELIGION 1-3 hours

295. SEMINAR IN RELIGION 1-3 hours

325. PHILOSOPHY OF RELIGION 3 hours
Critical inquiry into issues such as the nature and existence of God, the problem of evil, the significance of religious experience, the justification of
religious belief, the relation of faith and reason. Also listed as Philosophy 325. Formerly 452

346. EARLY CHRISTIAN THOUGHT 3 hours
Christianity from the post-New Testament period to the Council of Chalcedon in 451 A.D.

347. MEDIEVAL THOUGHT 3 hours
The development of theological and philosophical thought from 500 A.D. to 1350 A.D. Also listed as Religion 347.

353. REFORMATION AND MODERN CHRISTIANITY 3 hours
The Protestant-Catholic conflict and the impact of modern secular thought on Christianity from the Reformation through the nineteenth century.

361. CONTEMPORARY CHRISTIAN THOUGHT 3 hours
Basic issues, major theological positions, and representative theologians of twentieth century Christian thought.

365. JESUS 3 hours
(Formerly 461). A study of the life and teachings of Jesus in the context of first century Palestinian Judaism and in the subsequent development of Christian faith and scholarly speculation. Prerequisites: Religion 106 or 256, or consent of the instructor.

463. LIFE AND TEACHINGS OF ST. PAUL 3 hours
The insights of the most influential thinker and apostle in the early church.

491. SPECIAL TOPICS IN RELIGION 1-3 hours

495. SEMINAR IN RELIGION 1-3 hours

498. INDEPENDENT STUDY IN RELIGION 1-3 hours
Departmental permission required.

PHYSICS
(Department 124)

Professor Gangemi (Chairman); Associate Professors Messick, Roll, Weimer.

The primary aim of the physics department is to offer courses that will stimulate scientific thought, train the student to reason from fundamental experimental fact, 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.

The department aims to give a training sufficiently broad to enable the student to appreciate the physics of scientific articles, to teach physics in the public schools, to apply physics in engineering, medicine, and other sciences, and to pursue graduate work.
The physics major must complete 57 hours in his major field. The required courses are the following: Physics 231, 232, 233, 234, 235, 236, 303, (310, 320, 330, 340), 351, 352, 353, 361, 363, 411, 412, 413, 432, 433, 463. Six of the 57 hours are taken from the advanced laboratory group: Physics 310, 320, 330, 340.

A senior comprehensive examination is not required for the physics major.

The Physics Department also offers a minor in Physics. The student desiring to complete the requirements for the Physics minor must complete the following courses: Physics 231, 232, 233, 234, 235, 236, 351, 352, 411, 412, and 6 additional hours from among Physics 303, 353, 310, 320, 330, and 340. In some instances, substitutions for the above courses may be made with the approval of the department chairman.

In addition to the major and minor in Physics, the Department of Physics also offers a program leading to certification for teaching in the Ohio public schools. The program is designed for students whose goal is to teach Physics in the high schools and will include 45 hours chosen to satisfy Ohio State Certification requirements and to a limited extent the personal interests of the student. Although some flexibility is permitted, the courses taken in this program are chosen in consultation with the chairman of the Department of Physics and will depend upon the completion of any necessary prerequisites. This program differs from the major in Physics in that the student desiring certification for teaching must also be registered in the Department of Education and satisfy all requirements as determined by the State of Ohio and the Department of Education of Ohio Northern University. A detailed description of these requirements can be obtained from the Chairman of the Department of Education.

000. ORIENTATION 1 hour
Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Required of departmental majors. Offered every year in the Fall Term.

100. PHYSICS 3 hours
Intended for liberal arts students. Basic laws and principles which govern the behavior of nature with special emphasis on mechanics, and atomic and nuclear structure. The interaction of physics with other areas of culture will be considered. Offered each term every year.

105. PHYSICS FOR THE LIFE SCIENCES 3 hours
Basic laws and principles of physics with some emphasis on the life sciences. May be substituted for Physics 100. Credit may be received for Physics 100 or Physics 105 but not for both. Offered only when sufficient registration warrants.

190. SEMINAR 1 hour
Reading, discussion and reports on problems of historical and current interest in physics. Offered only when sufficient interest warrants.

Physics 211, 212, and 213 are non-calculus, general physics courses intended primarily for pre-pharmacy and secondary education students. Prerequisites: Mathematics 161, 162 or equivalent.
211. GENERAL PHYSICS: MECHANICS OF SOLIDS AND FLUIDS 3 hours
Basic principles of Newtonian mechanics of solids and liquids. The laboratory corresponding to this course is Physics 234. Offered every year in the Fall Term.

212. GENERAL PHYSICS: SOUND, HEAT, AND LIGHT 3 hours
Basic principles of sound propagation, heat and heat transfer, and light propagation. The laboratory corresponding to this course is Physics 235. Offered every year in the Winter Term.

213. GENERAL PHYSICS: ELECTRICITY AND MAGNETISM 3 hours
Basic principles of electricity and magnetic phenomena. The laboratory corresponding to this course is Physics 236. Offered every year in the Spring Term.

Physics 231, 232, and 233 are the calculus general physics courses designed for physics and engineering students. Physics 231 should precede 232 and 233. Prerequisite: Mathematics 261 which may be taken concurrently or its equivalent.

231. PHYSICS: MECHANICS OF SOLIDS AND FLUIDS 4 hours
Basic principles of Newtonian mechanics of solids and fluids employing the differential and integral calculus. The laboratory corresponding to this course is Physics 234. Offered every year in the Fall and Winter Terms.

232. PHYSICS: HEAT, SOUND, AND LIGHT 4 hours
Basic principles of sound propagation, heat transfer and light propagation. Differential and integral calculus are used. The laboratory corresponding to this course is Physics 235. Offered every year in the Fall and Winter Terms.

233. ELECTRICITY AND MAGNETISM 4 hours
Basic principles of electrical and magnetic phenomena. Differential and integral calculus are used. The laboratory corresponding to this course is Physics 236. Offered every year in the Spring Term.

234. PHYSICS LABORATORY: MECHANICS 1 hour
Experiments in basic Newtonian mechanics. Physics 231 should be taken concurrently, or instructor's permission must be obtained. Offered every year in the Fall and Winter Terms.

235. PHYSICS LABORATORY: HEAT, SOUND, AND LIGHT 1 hour
Experiments in heat, sound and light. Physics 232 should be taken concurrently, or instructor's permission must be obtained. Offered every year in the Fall and Winter Terms.
236. PHYSICS LABORATORY: ELECTRICITY AND MAGNETISM  1 hour
Experiments with basic electrical and magnetic phenomena. Physics 233 should be taken concurrently or instructor's permission must be obtained. Offered every year in the Spring Term.

241. BASIC ELECTRONICS FOR MEDICAL-TECHNICAL STUDENTS  2 hours
Basic physics of medical laboratory instruments, including principles of operation and techniques of use. Offered every year in the Spring Term.

250. ASTRONOMY I  3 hours
The evolution of man's understanding of the structure and extent of the solar system. A review of current knowledge of the solar system, and an introduction to stellar systems. Offered every year in the Fall Term.

251. ASTRONOMY II  3 hours
The structure and evolution of stars and stellar systems. Cosmology. Prerequisite: Physics 250. Offered every year in the Winter Term.

303. MODERN PHYSICS  3 hours
The concepts of relativity, quantum and wave mechanics, atomic structure and absorption and emission processes. Prerequisites: Mathematics 264 and Physics 233. Offered every year in the Winter Quarter.

310. THEORY AND ADVANCED LABORATORY: MECHANICS  1-3 hours
Prerequisite: one year of physics. Part of the Physics major program and offered when needed.

320. THEORY AND ADVANCED LABORATORY: LIGHT, HEAT, SOUND  1-3 hours
Prerequisite: one year of physics. Part of the Physics major program and offered when needed.

330. THEORY AND ADVANCED LABORATORY: ELECTRICITY, MAGNETISM, ELECTRONICS  1-3 hours
Prerequisite: one year of physics. Part of the Physics major program and offered when needed.

340. THEORY AND ADVANCED LAB: NUCLEAR PHYSICS AND SOLID STATE  1-3 hours
Prerequisite: one year of physics. Part of the Physics major program and offered when needed.

351. ANALYTICAL MECHANICS I  3 hours
Vector analysis, kinematics, conservative forces, planetary motion, pendulum, free and forced oscillations, coupled systems and normal coordinates, angular momentum, rigid bodies. Prerequisite. calculus and physics 233. Part of the Physics major program and offered when needed.
352. ANALYTICAL MECHANICS II 3 hours
LaGrange equations, canonical formulation, principle of least action, normal coordinates, rigid bodies, special relativity, mathematical methods. Prerequisites: Mathematics 362 and Physics 351. Part of the Physics major program and offered when needed.

353. NUCLEAR PHYSICS 3 hours
Nuclear radiation detection instruments, nuclear constituents and structure, nuclear models, nuclear reactions, fundamentals of nuclear reactor theory and design, shielding and safety principles in nuclear physics. Prerequisites: Physics 231, 232, 233. Offered every year in the Spring Quarter.

361. ELECTRONICS 3 hours
Theory of solid state devices, rectifier circuits, transistor amplifiers, oscillators and modulators, instrumentation applications. Prerequisites: Physics 213 or 233. Offered every year in the Fall Quarter.

363. GEOMETRICAL OPTICS 2 hours
The laws of geometrical optics, image formation by mirrors and lenses, optical aberrations and optical instruments. Prerequisite: Physics 232. Part of the Physics major program and offered when needed.

411. ELECTRICITY AND MAGNETISM I 3 hours
Electrostatic field theory, capacitance, multipole expansion, dielectric properties of matter; magnetic field theory; electromagnetic induction; magnetic properties of matter; Maxwell's equations and electromagnetic waves. Prerequisites: Mathematics 264 and Physics 233. Part of the Physics major program and offered when needed.

412. ELECTRICITY AND MAGNETISM II 3 hours
Advanced electric and magnetic fields; electric and magnetic properties of solids, electromagnetic radiation. Prerequisites: Mathematics 362 and Physics 411. Part of the Physics major program and offered when needed.

413. SOLID STATE 3 hours
A lecture and problems course in the structure of solids and their phenomena. Quantum and statistical mechanics concepts are introduced to develop theories of internal stress and strain in crystals, conductivity of electricity in metals, semiconductors and superconductors, magnetism, the thermal properties of solids and imperfections in solids. Prerequisite: Physics 303. Part of the Physics major program and offered when needed.

432. STATISTICAL PHYSICS 3 hours
433. THEORETICAL PHYSICS 4 hours
For students intending advanced work in physics, chemistry or mathematical physics. Selected topics in classical mechanics, electromagnetic theory, quantum theory, relativity, nuclear theory, and statistical mechanics. Part of the Physics major program and offered when needed.

463. PHYSICAL OPTICS 3 hours
The laws of physical optics, interference, diffraction and polarization and instrumentation. Prerequisite: Physics 363. Part of the Physics major program and offered when needed.

490. SPECIAL TOPICS IN PHYSICS 1-3 hours
Part of the Physics major program and offered when needed.

494. SEMINAR IN PHYSICS 1-3 hours
Part of the Physics major program and offered when needed.

497. INDEPENDENT STUDY 1-3 hours
Part of the Physics major program and offered when needed.

PSYCHOLOGY, SOCIOLOGY, AND SOCIAL WORK
(Department 133)
Professors Cohoe, Wildman (Chairman); Associate Professors Brubaker, Compton, P. Hruschka (On leave, 1981-82), Kahal; Instructors Heath, Negrey, Spaulding.
The objectives of the department are to develop within each student an understanding of human relationships, institutions, and social processes; familiarity with the nature and causes of social problems; acquaintance with the theories of behavior; ability to think more critically and to integrate insights for useful participation in community life; and preparation for advanced study in the individual's selected field.

PRELAW WITH PSYCHOLOGY, SOCIOLOGY, SOCIAL WORK, OR GERONTOLOGY
Study in the behavioral sciences provides an especially suitable background for prelaw students. The department, in cooperation with the College of Law at Ohio Northern University, offers a formal prelaw program with "guaranteed admission" to the law school.
To qualify for guaranteed admission students must complete the program with at least a 3.30 GPA. The program requires 36 credit hours of specially selected electives. Specific curricular requirements are available from the department chairman.

SECONDARY CERTIFICATION
Secondary teacher certification programs are offered in social psychology, sociology, and comprehensive social studies. Information on these programs is available from the department chairman or the Office of the Director of Teacher Education.
COURSE NUMBERING CODE—to simplify identification of courses in the department the following numbering code is used:
1st Digit—Level (1st year, 2nd year, etc.)
2nd Two Digits—Discipline:
   0 —Multi-discipline
   10’s, 20’s, 30’s —Psychology
   40’s, 50’s —Sociology
   60’s —Gerontology
   70’s, 80’s —Social Work
   90’s —Special Topics, Independent Study

Examples:
141—1st year, Sociology
335—3rd year, Psychology
270—2nd year, Social Work

FIELD WORK, EXTERNSHIPS & PRACTICA
The department offers a number of opportunities for out-of-class learning through field work, externships and practica. See the department chairman for details and eligibility requirements.

CAREERS IN THE BEHAVIORAL SCIENCES
The study of the various behavioral sciences provides preparation for entry into a number of different job opportunities. Consult with department faculty to explore various career options.

PSYCHOLOGY
The Psychology core is required for both the major and minor in Psychology:

CORE
   1. Psychology 100
   2. Psychology 111
   3. Psychology 210
   4. Psychology 211
   5. Biology 100
   6. Math 142

For the MAJOR
1. Psychology 000
2. The Psychology Core
3. 32 hours of Psychology Electives
4. Math 100 & 131 or Biology 113 & 231

For the MINOR
1. The Psychology Core
2. 17 hours of Psychology Electives

000. ORIENTATION
1 hour
Familiarization with the departmental requirements for majors, planning programs of courses, University catalog and library; career options. Also listed as Sociology 000 and Social Work 000.
100. PSYCHOLOGY
4 hours
General research and concepts in human behavior. Lectures, demonstrations, and observations.

111. INTRODUCTORY PSYCHOLOGY LABORATORY
1 hour
Experiments which demonstrate basic psychological principles and acquaint the student with laboratory procedures and writing reports. Usually to be taken concurrently with Psychology 100 but can be taken later. Required for Psychology majors, optional for other students enrolled in Psychology 100.

190. SPECIAL TOPICS IN PSYCHOLOGY
1-3 hours

200. PRACTICUM IN CHILD DEVELOPMENT
1 hour
Work with children in the department’s Child Development Center under supervision of an instructor and nursery school teacher. Practical experience in behavior management. Prerequisites: Psychology 212, approval of chairman.

201. QUANTITATIVE METHODS IN BEHAVIORAL RESEARCH
4 hours
Applications in the behavioral sciences of several sampling distributions (binomial, normal, Student’s t, Chi square, F, and certain distributions used in “nonparametric tests”) as well as correlation and regression. Major emphasis on testing behaviorally meaningful hypotheses. Also listed as Sociology 201. Prerequisite: Mathematics 142.

202. QUALITATIVE METHODS IN BEHAVIORAL RESEARCH
4 hours
Survey of major research techniques, including participant and non-participant observation, interview, questionnaire, use of available data, and experiment. Other topics include sampling and establishing causality and non-experimental research. Also listed as Sociology 202. Prerequisite: Psychology 100 or Sociology 105.

210. EXPERIMENTAL PSYCHOLOGY I
4 hours
An introduction to the logic of experimental research and the application of the methods of science to the study of behavior. Particular emphasis on framing empirically testable hypotheses, experimental design and analysis of data. Taught through lecture, computer simulation, and actual research experience. Extensive instruction in scientific communication and the APA Publications Manual. Prerequisites: Psychology 100 and 111, Mathematics 142.

211. EXPERIMENTAL PSYCHOLOGY II
4 hours
Continuation of 210.

212. PRINCIPLES OF BEHAVIOR MANAGEMENT
3 hours
The theoretical frames of reference and supporting research which underlie current conceptualizations of behavior modification in terms of the process of learning, conditioning and reinforcement theories. Prerequisite: Psychology 100.

215. DEVELOPMENTAL PSYCHOLOGY
3 hours
Basic theories in human development from conception through old age, contemporary research at each age level. Prerequisite: Psychology 100.
218. PSYCHOLOGY OF THE EXCEPTIONAL CHILD
The classification of the atypical child, the use of the school and other sources for meeting his needs. Prerequisite: Psychology 100.

226. HUMAN SEXUAL BEHAVIOR
The course will draw heavily on the literature in an attempt to provide students with an understanding of what is known (as well as what is not known) about the major facets of the human sexual behavior. Prerequisites: Psychology 100.

290. SPECIAL TOPICS IN PSYCHOLOGY

300. PRACTICUM IN TEACHING IN THE BEHAVIORAL SCIENCES
Specially planned teaching experiences in courses in the department and preparation of demonstrations. May be repeated to 6 hours but does not apply to major requirements. Also listed as Sociology 300 and Social Work 300. Prerequisites: Psychology 212 and approval of the chairman.

301. SOCIAL PSYCHOLOGY
The effect of social and cultural forces upon the individual. The nature and development of attitudes, languages, cognitive processes. Individual and group projects illustrative of the methodology of social psychology. Also listed as Sociology 301. Prerequisite: Psychology 100.

303. ADVANCED SOCIAL PSYCHOLOGY
Advanced study of competing perspectives in social psychology. Special emphasis on symbolic interactionist perspectives and "sociological" social psychology. Topics include interpersonal interaction, small group behavior, socialization, sex roles and the "self" in society. Also listed as Sociology 303. Prerequisite: Psychology 301 (Sociology 301).

304. PRACTICUM IN RESEARCH IN THE BEHAVIORAL SCIENCES
Assist and participate in ongoing research by faculty members within the department. May be repeated up to 6 hours but repeated hours do not apply to major or graduation requirements. Also listed as Sociology 304 & Social Work 304. Prerequisites: Psychology 111 or 202 and approval of the chairman.

305. ADULT DEVELOPMENT AND AGING
A study of the basic psychological processes in adult development and aging with an emphasis on a dynamic view of human development throughout the life span. Heavily oriented towards research methods and experimental findings. Prerequisite: Psychology 215.

310. THEORIES OF LEARNING
Major theories of learning, their origins and relevance in the light of current research and findings. Prerequisite: Psychology 212.
311. PSYCHOLOGY OF PERSONALITY 4 hours
The major theories of personality from Freud to contemporary theoretical approaches. Prerequisite: Psychology 100. 4 hours

312. PSYCHOLOGICAL ASSESSMENT 4 hours
The study of psychological measurement and evaluation in the areas of intelligence tests, tests of separate abilities, and personality inventories. Experience will be gained in test administration, scoring and interpretation. Prerequisite: Psychology 100. 4 hours

314. CLASSICAL & INSTRUMENTAL CONDITIONING 3 hours
A quasi-historical account of the major issues involved in classical and instrumental conditioning. The course emphasizes major empirical findings and the major theoretical issues that have resulted. Current work in learning and memory is covered on both the animal and human level. Course to be taught in alternate years with Psychology 310. Prerequisite: Psychology 212.

316. ORGANIZATIONAL PSYCHOLOGY 3 hours
A study of the interplay between people and organizations emphasizing basic psychological processes such as motivation, perception, and learning. Other areas of study include organizational climate, leadership, conflict resolution, decision making, and communication. Prerequisite: Psychology 100.

335. PHYSIOLOGICAL PSYCHOLOGY 3 hours
Psychology as a biological science. Physiological events underlying behavior, including sensory, neural, and glandular involvement in such topics as motivation, emotion, and learning. Prerequisite: Psychology 100 and Biology 231 or 331.

336. SENSATION AND PERCEPTION 3 hours
A study of sensory systems. Demonstration and evaluation of selected experiments in visual, auditory, gustatory, olfactory, and cutaneous perception. Prerequisites: Psychology 100 and Biology 231 or 331.

337. COMPARATIVE PSYCHOLOGY 3 hours
Survey of behavior of different phyletic levels from lower forms to man, with special emphasis on primate behavior. Prerequisites: Psychology 100 and Biology 100.

338. BRAIN AND BEHAVIOR 3 hours
A survey of the brain systems involved in anxiety, arousal, depression, schizophrenia, etc. Consideration will also be given to the behavioral and neurophysiological effects of various psychoactive drugs. Prerequisite: Psychology 335, or Biology 231 or 331.

390. SPECIAL TOPICS IN PSYCHOLOGY 1-3 hours

411. COUNSELING PSYCHOLOGY 3 hours
Basic methods of counseling plus a study of seven models for counseling intervention. Prerequisites: Psychology 311 or 420.
420. ABNORMAL PSYCHOLOGY I 3 hours

421. ABNORMAL PSYCHOLOGY II 3 hours
A review of the causes, diagnosis and treatment of schizophrenic disorders, paranoid disorders, disorders of impulse control, psychosexual disorders, personality disorders, organic mental disorders, and a survey of multiaxial diagnostic procedures and therapeutic techniques used in clinical psychology. Prerequisite: Psychology 100.

424. PRACTICUM IN COUNSELING PSYCHOLOGY 3 hours
Work with patients in a clinical setting under supervision, practical experience in interviewing and administering routine psychological tests. May be repeated once. Prerequisite: approval of instructor.

426. PRACTICUM IN PSYCHOLOGY 6-15 hours
A field experience in the area of psychology. Open to seniors. Prerequisite: approval of chairman.

434. HISTORY AND SYSTEMS OF PSYCHOLOGY 3 hours
An overview of the major lines of thinking which have influenced the field of psychology beginning with the ancient Greek philosopher-scientist up to the twentieth century. Emphasis is given to theories of Empiricism, Associationism, and Scientific Materialism as well as twentieth century schools of psychological thought.

490. SPECIAL TOPICS IN PSYCHOLOGY 1-3 hours

494. SEMINAR IN PSYCHOLOGY 3 hours
Open to seniors.

497. INDEPENDENT STUDY IN PSYCHOLOGY 1-3 hours
Prerequisite: approval of chairman.

SOCIOLOGY

A major in Sociology consists of the following requirements:
1. Sociology 000
2. Sociology 105
3. Sociology 201
4. Sociology 202
5. Sociology 446
6. Math 142
7. 33 hours of sociology electives
A minor in Sociology consists of the following requirements:

1. Sociology 105
2. Sociology 201
3. Sociology 202
4. Sociology 446
5. Additional sociology courses totaling 15 hours, selected in consultation with a member of the sociology faculty.

Sociology and the American Sociological Association

Outstanding students with sophomore or junior standing are encouraged to participate in this special program of independent study. In the first phase of the program, each student reads independently during the summer on a selected topic. In the second phase, the student attends the Annual Meeting of the American Sociological Association to hear reports of current research, to attend business sessions of the Association, and to learn about career opportunities in sociology. In the third phase, the student writes a paper on the topic of the summer reading and submits other reports on the activities at the Annual Meeting. Each student completing the program earns five hours of transferable credit from the University of Central Florida, the home institution of the coordinators of the program. Further information and applications can be secured from the ONU sociology faculty.

000. ORIENTATION  
1 hour
Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Also listed as Psychology 000 and Social Work 000.

105. SOCIOLOGY  
3 hours
Introduction to the basic phenomena and processes of social life: culture, socialization, deviance, social institutions (family, polity, economy, education, religion, military), bureaucratization, social inequality, collective behavior, social movements, and population. Analysis of the interplay between the person and social groups.

141. SOCIAL PROBLEMS  
3 hours
An analysis of cultural values and institutional arrangements as the origins of social problems. Inflation, unemployment, poverty, racism, and sexism are some of the topics covered. Prerequisite: Sociology 105.

191. SPECIAL TOPICS IN SOCIOLOGY  
1-3 hours

201. QUANTITATIVE METHODS IN BEHAVIORAL RESEARCH  
4 hours
Applications in the behavioral sciences of several sampling distributions (binomial, normal, Student's t, Chi square, F, and certain distributions used in "nonparametric tests") as well as correlation and regression. Major emphasis on testing behaviorally meaningful hypotheses. Also listed as Psychology 201. Prerequisite: Mathematics 142.

202. QUALITATIVE METHODS IN BEHAVIORAL RESEARCH  
4 hours
Survey of major research techniques, including participant and non-partici-
pant observation, interview, questionnaire, use of available data, and experiment. Other topics include sampling and establishing causality in non-experimental research. Also listed as Psychology 202. Prerequisite: Psychology 100 or Sociology 105.

203. MINORITY RELATIONS 3 hours
A study of the dynamics of minority-majority relations within American society, and of the characteristics, conditions, and problems of several minority groups, as defined by race, ethnicity, or sex. A significant component is individually tailored by the student to his professional goals. Also listed as Social Work 203. Prerequisite: Sociology 105.

240. MARRIAGE AND THE FAMILY 3 hours
An institutional perspective on the family, patterns of courting, marital parental behavior, trends in the contemporary American family. Prerequisite: Sociology 105.

241. SEX ROLE SOCIALIZATION 3 hours
Attention is focused on the roles of men and women in the society with particular emphasis on the social forces that shape boys and girls into adult men and women. Other major issues are also addressed. Prerequisite: Sociology 105.

242. EVALUATION RESEARCH 3 hours
The application of research methods to determine whether planned programs attain their goals. Involves program planning, program monitoring, impact assessment, economic efficiency analysis, and presentation of results. Prerequisites: Sociology 105, 201, and 202 and permission of instructor.

243. SOCIAL DEVIANCE I 3 hours
Sociological perspectives on the processes of individual and group deviance, a discussion of selected major forms of deviance, their causes, processes, and consequences. Prerequisite: Sociology 105.

245. ORGANIZATIONAL BEHAVIOR 3 hours
Theories, methods, and data in the sociological analysis of complex organizations (corporations, social agencies, hospitals, armies, labor unions, schools, governments, prisons, philanthropies, political parties.) Prerequisite: Sociology 105.

246. WORK AND OCCUPATIONS 3 hours
Size and distribution of the labor force; social life in the various particular occupations and types of occupations; occupational careers, including education and training for work; relationships between occupations and the rest of the social structure. Prerequisite: Sociology 105.

247. SOCIAL INEQUALITY 3 hours
The variety of stratification systems, status attainment, social mobility, and social immobility; detailed descriptions of life among the poor, rich and middle classes in America and elsewhere. Prerequisite: Sociology 105.
250. CULTURAL ANTHROPOLOGY
An introduction to the major concepts and principles of cultural anthropology. Cultural anthropology emphasizes the understanding of the total configuration and interrelationships of culture traits, complexes, and social relationships in a particular geographic environment and historical context. Prerequisite: Sociology 105.

291. SPECIAL TOPICS

300. PRACTICUM IN TEACHING IN THE BEHAVIORAL SCIENCES
Specially planned teaching experiences in courses in the department, including tutoring, curriculum development and preparation of demonstrations. Prerequisite: Psychology 212 and approval of the chairman. May be repeated to 6 hours. The course does not apply to major requirements. Also listed as Psychology 300 and Social Work 300.

301. SOCIAL PSYCHOLOGY
The effect of social and cultural forces upon the individual. The nature and development of attitudes, languages, and cognitive processes. Individual and group projects illustrative of the methodology of social psychology. Also listed as Psychology 301. Prerequisite: Sociology 105.

302. GERONTOLOGY
A study of the psychological, physiological and social aspects of the lives of our elderly citizens, with a special emphasis upon the environmental problems which confront them. Prerequisites: Psychology 100 or Sociology 105. Also listed as Social Work 302.

303. ADVANCED SOCIAL PSYCHOLOGY
Advanced study of competing perspectives in social psychology. Special emphasis on symbolic interactionist perspectives and "sociological" social psychology. Topics include interpersonal interaction, small group behavior, socialization, sex roles and the "self" in society. Also listed as Psychology 303. Prerequisite: Sociology 301 (Psychology 301).

304. PRACTICUM IN RESEARCH IN THE BEHAVIORAL SCIENCES
Assist and participate in ongoing research by faculty members within the department. Prerequisite: Sociology 202 and approval of the chairman. May be repeated up to 6 hours but repeated hours do not apply to major or graduation requirements. Also listed as Psychology 304 and Social Work 304.

340. URBAN SOCIOLOGY
Sociological perspectives on the organization, processes, problems, and other distinctive aspects of urban life. Topics include "urban decay," the "suburbia" phenomenon, and the impact of the urban environment on the individual. Prerequisite: Sociology 105.

345. COLLECTIVE BEHAVIOR
Sociological analysis of fads and fashions, the formation of public opinion, the nature of crowds (and how and why they may become riots), and the
development of social movements (Black power, women's lib, etc.) Prerequisite: Sociology 105.

347. CRIME AND DELINQUENCY  
3 hours  
Sociological analysis of major forms of crime and juvenile delinquency, theories, research methods, data and implications for control. Prerequisite: Sociology 105.

348. MEDICAL SOCIOLOGY  
3 hours  
Social interaction between patient and physicians, nurses, pharmacists, and other health-care personnel; social interaction among those personnel; social definition of illness; societal response to illness; social epidemiology; education and training of medical personnel. Prerequisite: Sociology 105.

352. SOCIAL DEVIANCE II: SEMINAR  
3 hours  
Advanced study, including considerable independent study, of topics covered in Social Deviance I. Special emphasis on competing theories of deviance and on very recent research. Prerequisite: Prerequisite: Sociology 243.

391. SPECIAL TOPICS IN SOCIOLOGY  
1-3 hours

446. SOCIAL THOUGHT  
4 hours  
Traces sociological theorizing from sociology's historical origins through the classical and contemporary periods. Important theorists covered include Karl Marx, Emile Durkeim, Max Weber, George Herbert Mead, Talcott Parsons. Emphasis is placed on comparing and contrasting the major theoretical perspectives which provide the foundation for a scientific study of social life. Prerequisite: Sociology 105.

448. POPULATION  
3 hours  
Size, composition, distribution and growth of human populations; theories of population growth and migrations; collection and use of U.S. Census and other censuses; population explosions, birth control and abortion. Prerequisite: Sociology 105.

491. SPECIAL TOPICS IN SOCIOLOGY  
1-3 hours

498. INDEPENDENT STUDY IN SOCIOLOGY  
1-3 hours  
Prerequisite: approval of chairman.

SOCIAL WORK
A major in social work consists of the following requirements:

1. Social Work 000
2. Social Work 270
3. Social Work 271
4. Social Work 203
5. Social Work 272
7. Social Work 474
8. Social Work 471
9. Social Work 480
10. Social Work 470
11. Social Work 472, 496
12. 6 hours of social work electives
13. Math 142
14. Biology 113, 231

000. ORIENTATION 1 hour
Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Also listed as Psychology 000 and Sociology 000.

170. CAREERS IN SOCIAL WORK 1 hour
An overview of the numerous settings of social work practice including services to children, medical social services, public welfare, mental health, and aging. Also describes social service administration, social policy development, and research.

192. SPECIAL TOPICS IN SOCIAL WORK 1-3 hours

203. MINORITY RELATIONS 3 hours
A study of the dynamics of minority-majority relations within American society, and of the characteristics, conditions, and problems of several minority groups, as defined by race, ethnicity, or sex. A significant component is individually tailored by the student to his professional goals. Also listed as Sociology 203.

270. INTRODUCTION TO SOCIAL WORK 3 hours
An introduction to the profession of social work, the scope of services and methods, and issues in the development of the profession.

271. INTRODUCTION TO SOCIAL WELFARE 3 hours
A survey of the historical development of social welfare in the United States; its roots in the English poor laws; emphasis on the description of current program and policy.

272. HUMAN BEHAVIOR AND THE SOCIAL ENVIRONMENT 3 hours
This course draws upon selected general education knowledge of the social sciences related to human functioning within the social environment, to offer the student an integrated knowledge base for social work practice. The focus will be upon developmental, interactional, and adaptational processes within a systems framework. Prerequisite: Social Work 270 or 271.

291. SPECIAL TOPICS 1-3 hours

292. SPECIAL TOPICS IN SOCIAL WORK 1-3 hours
300. PRACTICUM IN TEACHING IN THE BEHAVIORAL SCIENCES 2 hours
Specially planned teaching experiences in courses in the department, including tutoring, curriculum development and preparation of demonstrations. May be repeated to 6 hours but does not apply to major requirements. Also listed as Psychology 300 and Sociology 300. Prerequisite: Psychology 212 and approval of the chairman.

302. GERONTOLOGY 3 hours
A study of the psychological, physiological and sociological aspects of the lives of our elderly citizens, with a special emphasis upon the environmental problems which confront them. Prerequisites: Psychology 100 or Sociology 105. Also listed as Sociology 302.

304. PRACTICUM IN RESEARCH IN THE BEHAVIORAL SCIENCES 2 hours
Assist and participate in ongoing research by faculty members within the department. Prerequisite: Permission of instructor and approval of the chairman. May be repeated up to 6 hours but repeated hours do not apply to major or graduation requirements. Also listed as Psychology 304 and Sociology 304.

371. SOCIAL WORK INTERVENTION I 3 hours
Basic processes used in social work practice with special focus on developing skills in micro-intervention through simulations and actual home visits. Prerequisite: Social Work 272.

372. SOCIAL WORK INTERVENTION II 3 hours
Further exploration of social work methodology. Focus on developing skills in macro-intervention through a supervised group project to assess, design, and build a social program in a nearby community. Prerequisite: Social Work 371.

373. SOCIAL WELFARE ADMINISTRATION 3 hours
Within a systems perspective, skill development in the use of techniques of describing, reporting, and measuring client and target population characteristics, services, resources; use of information in decision making to allocate scarce resources among competing demands in an uncertain environment. Prerequisite: Social Work 372.

375. CHILD WELFARE 3 hours
A look at the needs of children and at services offering them protection, placement, and care. Also includes study of the history and policies of child welfare programs. Prerequisite: Social Work 270.

380. SOCIAL WELFARE POLICY & PROGRAM 3 hours
An analytical and case study approach to the examination of national social welfare policy and program within the context of basic political and governmental processes. A special focus is given to the analysis of income maintenance policy and program. Prerequisite: Political Science 105, 203; Social Work 371,372.
385. SERVICES TO FAMILIES
A study of problems in family development and functioning from a family systems perspective, with focus upon the service programs and interventive approaches to helping families. Prerequisite: Social Work 270.

392. SPECIAL TOPICS IN SOCIAL WORK
1-3 hours

401. AGING AND MENTAL HEALTH
3 hours
An introduction to the mental and behavioral disorders of the elderly; the policies and programs which address those disorders; and a focus on research related techniques of management and treatment of the elderly with disorders. Prerequisites: Gerontology 202, 302; Social Work 271; Psychology 305. Also listed as Gerontology 401.

470. SOCIAL WORK PROSEMINAR
3 hours
An introduction to field experience; an investigation of the range of services provided by the public and private agencies which are available for field placement; and an emphasis on induction into the work setting. Prerequisite: a social work major with senior standing.

471. INTRODUCTION TO LAW FOR SOCIAL WORKERS
3 hours
A summary of legal processes and statutes relevant to social welfare and social work practice issues; guest lecturers from the legal and law enforcement professions. Prerequisites: Social Work 371, 372.

472. FIELD EXPERIENCE IN SOCIAL WORK
15 hours
Placement in a social agency five days each week (thirty-six hours) throughout the quarter to provide experience in social work practice under qualified agency instruction-supervision, including responsibility for direct social work services to clients. Emphasis is on application of theory and knowledge in developing professional practice skills in the helping process with individuals, families, and client and community groups. Campus seminars are held concurrently to assist the student to integrate field work with classroom learning. To be taken concurrently with Social Work 496. Prerequisite: Social Work 470.

474. SOCIAL WORK RESEARCH
3 hours
An introduction to the basic research techniques of problem formulation, design, data analysis, and interpretation as they apply to social work practice. The computer is utilized as a fundamental research tool. The critiquing and utilization of research knowledge in practice and the evaluation of one's own practice are emphasized. Prerequisite: Social Work 373.

475. SOCIAL SERVICES IN MENTAL HEALTH
3 hours
A study of the history, policy, and organization of the mental health services in the United States. Special emphasis is given to multiple interpretations of mentally disordered behavior and maintenance of the chronically disabled in the community. Prerequisite: Social Work 270.
480. SOCIAL WELFARE POLICY AND PROGRAM 3 hours
An analytical and case study approach to the examination of national social welfare policy and program within the context of basic political and governmental processes. A special focus is given to the analysis of income maintenance policy and program. Prerequisites: Political Science 105,203; Social Work 371,372.

492. SPECIAL TOPICS IN SOCIAL WORK 1-3 hours

496. SEMINAR IN SOCIAL WORK 2 hours
Discussion and analysis of the field setting, practice and organization. Includes monitoring and evaluation of student competencies. To be taken concurrently with Social Work 472.

499. INDEPENDENT STUDY IN SOCIAL WORK 1-3 hours
Prerequisite: approval of chairman.

GERONTOLOGY
A major in Gerontology consists of the following requirements:

1. Gerontology 000
2. Gerontology 202
3. Gerontology 302
4. Gerontology 305
5. Gerontology 393
6. Gerontology 401
7. Gerontology 493
8. Gerontology 499
9. Psychology 100
10. Psychology 215
11. Sociology 105
12. Sociology 348
13. Social Work 271
14. Social Work 373
15. Biology—Physiology of Aging
16. Philosophy—Death and Dying or Bioethics

000. ORIENTATION 1 hour
Familiarization with the departmental requirements for majors, planning programs or courses, University catalog and library; career options. Also listed as Psychology 000, Sociology 000 and Social Work 000.

202. QUALITATIVE METHODS IN BEHAVIORAL RESEARCH 4 hours
Survey of major research techniques, including participant and non-participant observation, interview, questionnaire, use of available data, and experiment. Other topics include sampling and establishing causality and non-experimental research. Also listed as Psychology 202 and Sociology 202. Prerequisite: Psychology 100 or Sociology 105.
302. GERONTOLOGY
A study of the psychological, physiological and sociological aspects of the lives of our elderly citizens, with a special emphasis upon the environmental problems which confront them. Also listed as Sociology 302 and Social Work 302. Prerequisite: Psychology 100 or Social Work 105.

305. ADULT DEVELOPMENT AND AGING
A study of the basic psychological processes in adult development and aging with an emphasis on a dynamic view of human development throughout the life span. Heavily oriented towards research methods and experimental findings. Also listed as Psychology 305. Prerequisite: Psychology 215.

393. SPECIAL TOPICS IN GERONTOLOGY
1-3 hours

401. AGING AND MENTAL HEALTH
An introduction to the mental and behavioral disorders of the elderly; the policies and programs which address those disorders and a focus on research related to techniques of management and treatment of the elderly with disorders. Also listed as Social Work 401. Prerequisites: Gerontology 202, 302; Social Work 271; Psychology 305.

493. SPECIAL TOPICS IN GERONTOLOGY
1-3 hours

499. AGENCY OBSERVATION AND EXPERIENCE
A field experience in the area of Gerontology. Prerequisite: approval of chairman.

SPEECH AND THEATRE
(Department 153)
Associate Professor Ladwig (Chairman); Assistant Professors Bayliss, Riess, Roberts (Director of Communication Skills Center, on Leave 1981-82); Instructors Bakst, Johnson, Klein; Lecturers J. Dornbusch, Kinsey.

The Department of Speech and Theatre provides a concentrated and/or combination program.

Speech communication courses are designed to provide the major as well as the non-major with a basic knowledge in the art and skill of elective social communication through a foundation of logical composition and delivery of structured, organized, and effective oral discourse. Advanced courses investigate the theories, developments, and practices of the discipline. A major with an emphasis in Speech serves one or more of the following purposes:

1. more intensive study in this particular discipline as the emphasis within the student’s liberal arts education.
2. foundation for careers in business, public relations, law, politics, ministry, social work, broadcasting, etc.
3. preparation for graduate work.
4. preparation for a career in teaching.
Courses in Theatre develop an understanding of the function of the theatrical art form in society, foster appreciation for dramatic aesthetics, and provide theatrical experiences for the community as a whole.

A major with an emphasis in theatre serves one or more of the following purposes:

1. more intensive study in this particular discipline as the emphasis within the student’s liberal arts education.
2. preparation for a career in teaching.
3. preparation for graduate work leading to an M.A., M.F.A., Ph.D., or D.F.A. degree in theatre.
4. preparation for work in non-commercial field of theatre such as community theatre.
5. preparation for advanced training leading to a career in the professional theatre.

Beyond the traditional classroom learning situation the department offers and encourages active involvement with the disciplines. Participation in Individual Events and Debate is open to all students. Individual Events encompasses all individual speaking opportunities such as persuasive, informative, sales, impromptu, extemporaneous, and oral interpretation of all forms of literature. Debate encompasses formal debate on an annually chosen national topic and off-topic debating. Participation in theatre productions is open to all students. The department offers the student the opportunity to participate in the University Theatre, the Youth Theatre (touring children’s theatre company), and in the Studio Theatre (laboratory student mounted productions). Speech and Theatre activities can also include local, state, and national competition. Radio Station W.O.N.U. provides practical experiences for those students interested in broadcasting and management.

Included in the accredited curriculum of Speech and Theatre education, studies are provided leading to teacher certification in Speech and Communications (a combination of Speech and Theatre, English, Journalism, and Reading).

The student majoring in Speech and Theatre is expected to demonstrate artistic/professional competence prior to graduation. Throughout the student’s course of studies he/she will be counseled by an adviser regarding successful attainment of this requirement.

PRELAW PROGRAM
The department cooperates with the Pettit Law College at Ohio Northern University relative to the “guaranteed admission” prelaw program. Those students interested in the program and a course of studies within the department should contact the chairman for information and/or advising.

MAJOR: SPEECH AND THEATRE
The major in Speech and Theatre requires a minimum of 45 hours beyond Speech 100 and Theatre 105 and must include the following:

Speech 110, 210, 262, 270, 271, 272, 371
Theatre 231, 241, 242, 282, 331, 386
Also required are 1—3 hours in Speech 497 and/or Theatre 498 (Independent Study).
Speech Communication 100 and Theatre 105 are prerequisites for all advanced area courses but do not count toward the major nor does any grade within the department below a "C."

Speech Communication 100 and Theatre 105 should be taken (and credit earned) during the freshman year.

Majors are encouraged to explore an internship as partial satisfaction of major requirements.

Additional hours shall be elected from within the department or from cognate areas (as approved by the department) to complete the minimum major requirements. Areas of concentration may be obtained by electing advanced speech or theatre courses.

Students wishing to focus solely in Speech or Theatre or Public Relations as their major should work closely with an advisor to determine specific course schedules relative to their career goals.

MAJOR: PUBLIC RELATIONS

The major in Public Relations requires a minimum of 74 hours in the following (prerequisites for all courses must be met and do not count toward the major):

Art 161, 222
English 241, 243, 246, and 343 or 344
Marketing 351, 371, 372; Business Law 322
Psychology 212, 301, 316
Speech 110, 120, 210, 235, 272, 360, 371, 373, 380, 410, 497

MINORS

Minors are offered in the areas of Speech, Theatre, a combination of Speech and Theatre, or Organizational Communication. A minor in any of these areas constitutes the successful completion (e.g., C or better grade) of no less than 30 course hours. Because of the diversity of the minor program within the department, each student declaring such program must work closely with a departmental advisor to select courses to satisfy requirements.

MINOR IN ORGANIZATIONAL COMMUNICATION

Designed primarily for the non-major, the MINOR IN ORGANIZATIONAL COMMUNICATION complements a wide range of studies leading to careers in business and industry, law, engineering, education, government, and social and community services. Specific courses include Speech 210, 235, 272, 371, 380, 410, six hours in approved electives which relate to the student's overall program, three hours in Professional Writing, and Psychology 100, 301, 316, or Sociology 105, 245, 301.

IN-DEPTH FOR NON-MAJORS

Non-majors may satisfy In-Depth requirements in the department via any two 3-hour courses or the equivalent of six hours (e.g., a combination of 1, 2, or 3-hour courses.) If the General Education course taken is Speech Communication 100, the In-Depth hours must be in the area of Speech; if
the General Education course taken is Theatre 105, the In-Depth hours must be in the area of Theatre. Speech 120, 220, and other Broadcasting or Public Relations courses will satisfy only Speech In-Depth.

SPEECH

000. ORIENTATION 1 hour
Familiarization with the departmental requirements for majors, planning program of courses, university catalog and library. Also listed as theatre 000. Required of departmental majors. S/U grading.

100. SPEECH COMMUNICATION 3 hours
Basic concepts and practices of interpersonal, public, group communication. Preparation, composition, presentation of speeches. Basic knowledge of the process of communication in society. Required labs in Communication Skills Center.

110. ARGUMENTATION 3 hours
Basic argumentative speaking and debate; proposition analysis; use of evidence, elementary logic, and case construction. Emphasis on simulated activities, such as in-class debates.

120. INTRODUCTION TO BROADCASTING 3 hours
A brief historical survey of the evolution of broadcasting, along with examination of contemporary practices in announcing, programming, scheduling, traffic. etc. Laboratory hours arranged.

125. BROADCASTING 3 hours
To acquaint participants with operational procedures of commercial radio stations. Participation in radio performance, production, and writing techniques. Practice in performance skills offered via required labs and provided through production facilities at WONU Radio.

210. INTERPERSONAL COMMUNICATION 3 hours
Analysis of dimensions and relationships in interpersonal communication, especially needs, perceptions, orientations, contexts, and barriers. Course is oriented toward exercises, demonstrations, and applications to student's own experience with basis upon transactional analysis.

215. NON-VERBAL COMMUNICATION 3 hours
A fundamental approach to understanding basic aspects of non-verbal communication and how non-verbal codes interact to satisfy important communication codes.

220. BROADCASTING ACTIVITIES 1-3 hours
Broadcasting practicum involving, but not limited to, announcing, traffic, management, scheduling, programming, writing, etc. May be repeated for graduation credit by non-majors up to a maximum of six hours. Prerequisite: permission of department. S/U marking.
235. INTERVIEWING 3 hours
Examination of the basic principles and techniques of interviewing and their applications to informational, employment, and persuasive/counseling situations. In-class and out-of-class experiences in actual interviewing provide emphasis.

254. VOICE AND DICTION 3 hours
Voice and speech production; intensive drill, on a phonetic basis, in articulating the sounds which make up the English language, with attention to the production of good vocal quality and expression. (Alternate years: offered 1982-1983.)

262. ORAL INTERPRETATION 3 hours
Analysis and oral interpretation of the logical, emotional and aesthetic experience in poetry, prose, and dramatic dialogue, with emphasis on individual preparation and performance.

270. SPEECH ACTIVITIES: INDIVIDUAL EVENTS 1-3 hours
Extra-curricular individual events activities. May be repeated for graduation credit by non-majors up to a maximum of six hours. S/U marking.

271. SPEECH ACTIVITIES: DEBATE 1-3 hours
Extra-curricular debate activities. May be repeated for graduation credit by non-majors up to a maximum of 6 hours. S-U grading.

272. PUBLIC SPEAKING 3 hours
Extensive application of basic principles of oral communication in the composition and delivery of original speeches.

273. SEMINAR IN PUBLIC ADDRESS 3 hours
Studies in the development of rhetorical theory and oratory from the Greeks to the present. (Alternate years: offered 1983-1984.)

290. SPECIAL TOPICS IN SPEECH 1-3 hours

360. PARLIAMENTARY PROCEDURE 3 hours
Methodology of conducting formal meetings by parliamentary rules. (Alternate years: Offered 1983-84).

365. READER'S THEATRE 3 hours
Individual and group performance in the dramatic interpretation of the novel, short story, drama, and poetic forms; lab rehearsals for University performance. (Alternate years: offered 1982-1983.) Prerequisite: Speech 262 or 363 or permission of instructor.

370. SPEECH THEATRE METHODS 3 hours
Investigation, survey, readings, methods, and application of teaching techniques in speech, communication, broadcasting, and theatre. Includes sequential observations and participation in actual classroom situations. Required
of all majors seeking teacher certification. Prerequisite: Acceptance into teacher education program or permission of the instructor.

371. GROUP COMMUNICATION 3 hours
The process of group discussion and problem-solving techniques; opportunities to participate in and lead discussion.

373. PERSUASIVE SPEAKING 3 hours
Understanding and applying techniques of persuasion through audience analysis, preparation and delivery of speeches, and utilization of persuasive theories in both practice and composition. (Alternate years: offered 1982-1983.)

380. ORGANIZATIONAL COMMUNICATION 5 hours
Functions, forms and patterns of communication in organizations. Effects of organizational structures and dynamics on communication. Methods of evaluating communication policies and practices as an aid to organizational management. A survey course designed to introduce students to the nature of organizational communication, its problems and techniques for improvement. Emphasis on internal communication audit. Lab hours arranged.

410. CONTRACT FIELD EXPERIENCE 5-15 hours
Demonstrating an understanding of basic communication techniques in problem solving and gaining practical experience in an organization. A project is arranged with a cooperating organization on or off campus by the student and his/her advisor. Projects may consist of regular work assignments within the organization where the internal communication audit can be applied as a major tool of analysis and feedback. By permission of the instructor only.

490. SPECIAL TOPICS IN SPEECH 1-3 hours

494. SEMINAR IN SPEECH 1-3 hours

497. INDEPENDENT STUDY IN SPEECH 1-3 hours
Prerequisite: permission of department.

THEATRE

000. ORIENTATION 1 hour
Familiarization with departmental requirements for majors, planning program of courses, university catalog and library. Also listed as speech 000. Required of departmental majors. S/U marking.

105. THEATRE 3 hours
General survey of the theatrical art form utilizing the screening of popular films. Emphasis includes acting, directing, and design.

231. STAGECRAFT I 3 hours
Introduction to theoretical and practical work in the fundamentals of technical theatre production. Required lab work.
232. STAGECRAFT II
Advanced practical work and applied theory of technical theatre production. Required lab work. Prerequisite: Theatre 231.

241. THEATRE HISTORY I
History of the theatre from ancient ritual to 1800.

242. THEATRE HISTORY II
History of the theatre from 1800 to the present.

250. PRODUCTION
Open only to those students who have auditioned for and have been awarded roles in major University Theatre or Studio Theatre productions; 1-3 hours depending on role. May be repeated by non-majors for graduation credit up to a maximum of 6 hours. Prerequisite: Permission of director. S-U grading.

280. THEATRE ACTIVITIES
Participation in technical/productional aspects of University and/or Studio Theatre productions. A maximum of six hours may be taken by non-majors for graduation credit.

282. ACTING TECHNIQUES: MOVEMENT
Exercises, improvisations, studies, pantomimes, etc., to develop acting with emphasis on physical interpretation of characters.

283. ACTING TECHNIQUES: CHARACTERIZATION
Advanced work leading to the presentation of character via performance. Prerequisite: Theatre 282.

291. SPECIAL TOPICS IN THEATRE

331. MAKEUP
Methodology and practice in the creation and application of stage makeup. Students compose makeup crews for University Theatre and Studio Theatre productions.

351. CREATIVE DRAMA
Methodology and practice of incorporating drama into educational, community, religious, recreational activities for children and youth of all ages.

352. CHILDREN'S THEATRE
Rehearsal and preparation of script, sets, etc. for the Spring tour of O.N.U. Youth Theatre. May be repeated for a total of 6 hours. Prerequisite: Theatre 351 or permission of director.

353. CHILDREN'S THEATRE TOUR
Actual tour and performance of O.N.U. Youth Theatre. Possible field experience credit for Education majors. May be repeated for a total of 6 hours. Prerequisite: permission of director.
365. READER’S THEATRE
3 hours
Individual and group performance in the dramatic interpretation of the novel, short story, drama, and poetic forms; lab rehearsals for University performance. Prerequisite: Speech 262 or 363 or permission of instructor. (Offered alternate years, 1982-83)

386. DIRECTING
3 hours
Methods, theories, exercises, and practices in directorial concepts; production of scenes in Studio Theatre. Prerequisites: 3 hours of stagecraft plus 3 hours of acting techniques or permission of instructor. (Offered alternate years, 1982-83)

441. SCENE DESIGN
3 hours
Methodology and practice in the art of scenography; application via University Theatre, Children’s Theatre, and/or Studio Theatre productions. Alternate years: offered 1982-1983. Prerequisite: Theatre 232.

442. LIGHTING DESIGN
3 hours
Methodology and practice in the arts of lighting design; application via University Theatre, Children’s Theatre, and/or Studio Theatre productions. Prerequisite: Theatre 231. (Offered alternate years, 1983-84)

443. COSTUME DESIGN
3 hours
Methodology and practice in costume design and construction; application via University Theatre, Children’s Theatre, and/or Studio Theatre productions. Required lab work. (Offered alternate years, 1983-84)

491. SPECIAL TOPICS IN THEATRE
1-3 hours

495. SEMINAR IN THEATRE
1-3 hours

498. INDEPENDENT STUDY IN THEATRE
1-3 hours
Prerequisite: permission of department.
THE
College of
Business Administration
Clyde A. Painter, Dean

Professors Conklin, Painter, Young; Associate Professors Goldberg, Walden; Assistant Professors Ewing, Linch, Logsdon, Meiningen, Moore; Instructors McLaughlin, Savino; Lecturers DePoy, Earl, Klay, Lile, Woods.

On February 4, 1978, the Ohio Northern University Board of Trustees authorized a College of Business Administration and requested the President of the University to implement steps and procedures in establishing this new academic unit.

The College of Business Administration has as its nucleus the former Department of Business and Economics, which had existed for many decades as a segment of the College of Arts and Sciences. The new College of Business Administration became fully operational on September 1, 1978, and has been authorized to award the degree of Bachelor of Science in Business Administration.

The GEORGE WILLARD PATTON CHAIR OF ECONOMICS, endowed by the Richard King Mellon Charitable Trust of Pittsburgh, Pennsylvania, has been established beginning with the academic year 1973-74. The current year’s recipient of this endowed professorship is Charles F. Conklin, professor of economics.

Objectives
The College of Business Administration through its several major areas of study seeks to develop a basic understanding of the theories and principles of business administration and economics as they apply to our modern economic system and the organization and management of contemporary business enterprises. Students are afforded the opportunity to major in the five disciplines as authorized by the faculty, which are: Accounting, Economics, Finance, Management, and Marketing.

Admissions Standards
Candidates seeking admission to the College of Business Administration are required to meet the general requirements for admission to the University. The College of Business Administration accepts high school graduates and a limited number of non-graduates who have sixteen (16) acceptable units of high school credits and who are recommended by their high school principal. Twelve of these units are prescribed as follows: Four (4) units of English; two (2) units of mathematics (including algebra and
geometry); six (6) units in history, social studies, language, or natural science, or any combination thereof. Candidates are encouraged to pursue a foreign language while in high school. Acceptable scores on the College Entrance Examination Board Test or the American College Test are expected of all candidates.

High School seniors with proven superior ability and maturity may enroll for a limited amount of course work for credit on campus during their senior year, or during the summer preceding, if they have the written recommendation of their high school principal and the approval of the Academic Qualifications and Scholarship Committee of the College of Business Administration.

Transfer Students
The Ohio Northern University College of Business Administration welcomes students from other accredited colleges and universities. It is preferred that such students had previously been enrolled in degree programs comparable to the majors offered in the college, or in the case of transfer from a two-year college, they had been in the college parallel program. Applications for transfer will be considered only if the student has a prior grade point average of 2.00 on a four point scale, and that the student is eligible to return to his/her former institution.

THE BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION DEGREE PROGRAMS

General and Advanced Course Structure
The first two years of study in the College of Business Administration are usually devoted to the student’s general education with an introduction to several of the business disciplines. Most of the student’s exposure in his/her major area of study is planned to take place at the more advanced level along with selected upper division electives. A minimum of 182 quarter hours of appropriate academic credits must be presented to qualify for the awarding of the degree of Bachelor of Science in Business Administration.

Common Core
The following courses are required of all business majors: Orientation 000; Accounting 131, 132, 133; Economics 100, 202, 203; Business Law 322; Managerial Finance 362; Mathematics 111 or 130; and Mathematics 142-143 or 154-155. Specific details of coursework required for the several majors are available from the dean’s office and/or the student’s academic adviser.

Major Requirements
Accounting Major: Core plus: Accounting 301, 302, 303, 311, 312, 313, plus 12 quarter hours of approved upper division accounting electives; cognates and 9 quarter hours of CBA electives. Specified General Education courses plus 9 quarter hours of Arts and Sciences electives. Approved general electives of 48 quarter hours.

Economic Major: Core plus: Economics 383, 384 and 18 quarter hours of approved upper division economics electives; cognates and 9 quarter hours
of CBA electives. Specified General Education courses plus 9 quarter hours of Arts and Sciences electives. Approved general electives of 45-48 quarter hours.

**Finance Major:** Core plus: Accounting 311, Economics 352, Finance 354, 362, 374, 461, 463; Finance 421, 422 or 12 quarter hours of CBA electives; cognates and 9 quarter hours of CBA electives. Specified General Education courses plus 9 quarter hours of Arts and Sciences electives. Approved general electives of 42 quarter hours.

**Management Major:** Core plus: Management 330, 363, 385, 485, or 495, Business Law 325, Economics 352, Marketing 351 and 12 quarter hours of management electives; cognates and 9 quarter hours of CBA electives. Specified General Education courses plus 9 quarter hours of Arts and Sciences electives. Approved general electives of 48-51 quarter hours.

**Marketing Major:** Core plus: Marketing 351, 371, 372, 373, 375, 451, 454 and 6 quarter hours of marketing electives; cognates, and 9 quarter hours of CBA electives. Specified General Education courses plus 9 quarter hours of Arts and Sciences electives. Approved general electives of 45-48 quarter hours.

**GRADUATION REQUIREMENTS**

**BACHELOR OF SCIENCE IN BUSINESS ADMINISTRATION**

It is the student's responsibility to assure that all of the graduation requirements for the degree and major(s) sought are satisfied.

1. The pre-college or preparatory courses, normally taken in high school. See Admission Standards.

2. The specific courses and other general core courses in the College of Business Administration and the College of Arts and Sciences.

3. The major coursework, the Arts and Sciences support courses, and the proper elective distributions as required for the specific major(s).

4. Satisfactory completion and presentation of a minimum of 182 quarter hours of appropriate course work for the specific major(s) sought.

5. A grade point average of 2.00 is required for graduation. A letter grade of (C) or better is required in all common core courses taught within the College of Business Administration, as well as all other courses in the students' major(s).

6. Recommendations by the faculty and the dean of the College of Business Administration that the degree of Bachelor of Science in Business Administration be conferred by the University.

**GENERAL REGULATIONS OF THE COLLEGE OF BUSINESS ADMINISTRATION**

1. A student may **not** register for more than 19 hours of academic coursework without the dean's written approval. A normal program consists of 12 to 18 scheduled hours including physical education.

2. All freshmen in the College of Business Administration are required to take Orientation, which is normally scheduled in the fall term.

3. A student indicates his/her major choice by completing a declaration of major form available in the office of the dean. Faculty advisers assist the student in the planning of his/her major.
4. No course taken in the College of Business Administration for which the student receives a letter grade of (D) or less is acceptable toward the requirements of the major(s).

5. Generally, 100, 200, 300, and 400 level courses are to be taken by freshmen, sophomores, juniors and seniors respectively.

6. Each student enrolled in the College of Business Administration is expected to make consistent progress toward completion of the degree requirements of his/her major(s).

7. With the written permission of the instructor and the dean, course prerequisites may be waived.

8. Except where noted in the course descriptions, credit hours earned in repeated courses may be counted only once in the total hours required for graduation.

9. The freshmen English courses—English 107, 108, 109—are sequential and accumulative and must be taken one at a time in order.

S/U GRADE OPTION
Sophomores, juniors, seniors, and post graduate students in the College of Business Administration are given the opportunity to register for one course per term on an S/U option basis, with the following stipulations:

1. The student must be registered full time in the College of Business Administration.

2. The student must have sophomore, junior, senior, or post graduate standing.

3. The requested course cannot be in the College of Business Administration except those specified as S/U in course descriptions.

4. The course cannot be a 100 level general education course.

5. The requested course cannot be a cognate.

6. The grade of “S” is to be equated with A, B, C, and the grade of “U” is equated with D or F. S/U grades are not computed in the accumulative grade point average.

7. The student cannot change the grading option after the second week of classes.

CLASSIFICATION OF STUDENTS
For purposes of classification, the minimum requirements for sophomore standing are 45 quarter hours of completed academic work; for junior standing 90 quarter hours with all freshmen and sophomore requirements satisfactorily completed; for senior standing, 135 quarter hours of completed course work.

ACADEMIC PROBATION
A grade point average of 2.00 is required for graduation. If a student’s accumulative grade point average falls below 2.00 within a given quarter, he/she is placed on academic probation and the student’s participation in extra-curricular activities is reviewed by the Dean of Student Services and by the dean of the student’s college.

Any student on probation whose work for the following quarter continues below 2.00 will have his/her record reviewed by the Academic Qualifications
and Scholarship Committee of the College and may be recommended to
the dean for suspension from the University.

PRELAW PROGRAM
The College of Business Administration cooperates with the Ohio Northern
University College of Law in a unique prelaw program. Students in the
prelaw program select a major and complete the necessary requirements as
do other business students. However, elective courses of approximately
thirty-six (36) credit hours are carefully prescribed by categories. Examples
of these categories are: a broad historical area, American government
courses, analysis of evidence, writing ability, language, and logical reasoning.
Study in these areas assist the student in obtaining exposure to a broad
liberal arts background recommended by many law schools. To assist
students in the planning of this course work there is a special prelaw adviser
in the College of Business Administration.

Students who complete the prelaw four year program with a minimum of
a 3.30 GPA are admitted automatically to the Ohio Northern College of Law.
However, the law school admission test (LSAT) is required. For students with
GPA's under 3.30, admission to law school will depend largely upon their
LSAT score.

The prelaw program is open to all academic majors in the College of
Business Administration. This option is also available to sophomore and
junior transfer students from accredited four-year colleges and for students
who hold an associate degree from an accredited junior college. Transfer
students who successfully complete the prelaw program, have had at least 90
quarter hours at ONU and graduate with a 3.40 accumulative grade point
average will also automatically be admitted to the ONU College of Law.
Again the LSAT is required. The dean and the faculty of the College of
Business Administration believe that the prelaw program offers an excellent
opportunity for superior students preparing for a career in the legal pro-
fession. Additional information is available through the office of the dean,
the student's academic adviser and/or the prelaw adviser in the college.

S.B.I. AND INTERNSHIP PROGRAMS
The College of Business Administration offers a limited number of enrollment
spaces for upper class students in both the Small Business Institute and
Internship Programs. These options are intended to expose selected students to contract case studies and approved academic internships for a
maximum of 15.0 quarter hours of academic credits. Details of both
programs are available through the office of the dean.

GENERAL COURSES

000. ORIENTATION/CAREER DEVELOPMENT & SEARCH 1 hour
Familiarization with the college, requirements of the majors, planning se-
quencies of courses, university catalogue and library, career investigation and
guidance. Fall Quarter.

200. PERSONAL FINANCIAL MANAGEMENT 3 hours
A systematic, goal-oriented framework for personal money management.
Attention is given to the respective roles of budgeting, banking relationships,
insurance programs, and investments in developing and maintaining the comprehensive financial plan. The application of sound decision models and accurate record keeping within the family unit is emphasized. Not open to Finance majors or students with credit in 500-461. Offered alternate years.

322. BUSINESS LAW I 3 hours
Introduction to the legal system, including criminal law, torts (civil liability), and contract law.

323. BUSINESS LAW II 3 hours
Negotiable instruments, and business associations, (the legal rights, responsibilities of agents, partnerships, and corporations). Prerequisite: 500-322

324. BUSINESS LAW III 3 hours
Sales, creditors rights, secured transactions, consumer law, environmental law, government regulation and property rights. Prerequisite: 500-322.

344. STATISTICAL TECHNIQUES IN ECONOMICS 3 hours
Develops analytical tools in probability, and probability distributions, estimation and hypothesis testing, bayesian analysis, game theory and sampling techniques, with appropriate examples. Prerequisite: 123-142,143. Offered alternate years.

391. BUSINESS COMMUNICATIONS 3 hours
The techniques of writing business letters and reports; efficient and accurate communication of economic and business facts; presentation of conclusions for management decision-making and further study of English for self improvement. Prerequisite: English 107, 108, 109.

475. SMALL BUSINESS INSTITUTE 3 hours
A team of students is assigned to work with a small business. Supervision is provided by a faculty member. A confidential and professional relationship is maintained between the team and the client business. Course is graded S or U. May be repeated up to 9 hours. Restricted enrollment. Offered Fall and Spring quarters. Prerequisite: permission of Director.

ACCOUNTING

131. PRINCIPLES OF ACCOUNTING I 3 hours
Basic concepts and standards in accounting; their application to service, trading, and manufacturing concerns. The periodic determination of income, preparation of working papers, financial data, and financial analysis.

132. PRINCIPLES OF ACCOUNTING II 3 hours
Continuation of accounting 131. Prerequisites: 500-131, for CBA majors a grade of C or better in 500-131.

133. PRINCIPLES OF ACCOUNTING III 3 hours
Continuation of 500-132. Prerequisite: 500-132; for CBA majors a grade of C or better in 500-132.
292. SPECIAL TOPICS IN ACCOUNTING  

301. INTERMEDIATE ACCOUNTING  
Income measurement and recognition, the matching process, financial statement and actuarial mathematics as applied to accounting problems, pensions, and leases, tax allocation, price-level effects, funds flow, and accounting changes. Prerequisite: 500-133.

302. INTERMEDIATE ACCOUNTING  
Continuation of 500-301. Prerequisite: 500-301.

303. INTERMEDIATE ACCOUNTING  
Continuation of 500-302. Prerequisite: 500-302.

311. COST ACCOUNTING  
Job order, process, and standard cost systems. Controls for material, labor, and overhead. Methods of cost allocation. Joint byproduct costs. Flexible budgets and the development of cost parameters. Use and interpretation of accounting data in controlling and planning business activities and decision making. Business problems are examined from the point of view of internal management. Prerequisite: 500-133.

312. COST ACCOUNTING  
Continuation of 500-311. Prerequisite: 500-311.

313. COST ACCOUNTING  
Continuation of 500-312. Prerequisite: 500-312.

381. INCOME TAX I  
The federal income tax structure as related to individuals and corporations, problems involving the law and regulations; tax areas applicable to different forms of business organizations. Prerequisite: junior standing.

382. INCOME TAX II  
Continuation of income tax 381. Prerequisite: Income tax 381.

403. AUDITING I  
Auditing accounting records and statements, techniques of verifying financial statement items, preparation of working papers, and the writing of audit reports for a complete audit. Prerequisite: 500-303.

404. AUDITING II  
Continuation of 500-403. Prerequisite: 500-403.

427. INTERNSHIP  
Field experience in accounting. Consult Adviser.

472. CPA PROBLEMS  
A comprehensive review of the application of accounting principles, using specific problem situations, and development of approaches to problem solving. Intensive preparation for the CPA examination. Course graded S or U. Prerequisites: 500-381 and 403.
473. CPA PROBLEMS
Continuation of 500-472.

492. SPECIAL TOPICS IN ACCOUNTING
3 hours

496. SEMINAR IN ACCOUNTING
1-3 hours

499. INDEPENDENT STUDY IN ACCOUNTING
An exploration in depth of subject of special interest to both the student and the faculty member. Class hours by arrangement. Prerequisite: Junior standing and approval of the instructor. Restricted enrollment. Permission to enroll must be obtained in writing from the faculty-mentor and the dean of the college prior to registration.

ECONOMICS

100. ECONOMICS
3 hours
The origins, characteristics, and functions of our economic organization, current institutional arrangements, the use of appropriate tools of economic analysis; relevant economic and social goals.

202. PRINCIPLES OF MICROECONOMICS
Economics of the individual firm in the free market economy; competitive and monopolistic markets. How prices ration goods and services to users, and the principles on which the total product is divided among the owners of the factors of production. Actual cases from business. Prerequisite: for CBA majors a grade of C or better in 500-100.

203. PRINCIPLES OF MACROECONOMICS
3 hours
Forces that determine the behavior of national income and output, unemployment, and the price level. Rudiments of money and banking, monetary and fiscal policy, growth and development. Selected issues of contemporary social relevance. Prerequisite: for CBA majors a grade of C or better in 500-100.

273. ENERGY ECONOMICS
An analysis of the major issues of the energy problem: recent experiences, current problems, and future prospects for each energy source; demand restraints, energy conservation, tradeoffs between energy supply and environmental protection; energy research, and the development of major policy issues; points of view of producers, consumers, and government are presented. Prerequisite: 500-100.

290. SPECIAL TOPICS IN ECONOMICS
1-3 hours

341. LABOR ECONOMICS
3 hours
Labor as a factor in production; labor mobility; theories of the determination of wages, and bargaining theory; history and methods of labor unions, and government are presented. Prerequisite: 500-202 and 203.

348. URBAN ECONOMICS
3 hours
Topics covered will include definitions of urban places and regions; origins
of cities; local public finance; economics of urban housing; urban transportation; economics of crime and pollution, poverty and discrimination. Prerequisites: 500-202 and 203. Offered alternate years.

352. MONEY AND BANKING 3 hours
Theories of money and credit; commercial banking practices; reserve banking; monetary and banking laws; money market; money and credit in the world economy. Prerequisites: 500-202 and 203.

383. INTERMEDIATE MICROECONOMIC THEORY 3 hours
Special problems of pricing, production, and distribution under perfect competition, oligopoly, duopoly, and monopoly in the American economy. Prerequisites: 500-202 and 203.

384. INTERMEDIATE MACROECONOMIC THEORY 3 hours
The principles, measurement, analysis, and control of aggregate economic activity; the role of consumption, investment, and saving in achieving full employment output, economic growth, and price stability. Prerequisites: 500-202 and 203.

385. INTERNATIONAL ECONOMICS 3 hours
Theories and current problems of trade between nations; governmental restrictions and controls; the importance of multilateral trade, balance of payments; scarce resources; population, and employment trends. Prerequisites: 500-202 and 203. Offered alternate years.

411. COMPARATIVE ECONOMIC SYSTEMS 3 hours
A comparative study of capitalism, socialism, and communism with emphasis on the economics of pricing, production, and distribution under these systems. A specific and empirical examination of these systems in actual use, as in the United States, Russia, Great Britain, and China. Prerequisites: 500-202 and 203. Offered alternate years.

423. ECONOMICS OF THE PUBLIC SECTOR 3 hours
Topics include the federal budget; public good analysis, public debt issues; evaluation of tax sources for the federal, state, and local government levels; and inter-governmental fiscal relationships. Prerequisites: 500-202 and 203. Offered Spring Quarter.

426. INTERNSHIP 1-15 hours
Field experience in economics. Consult adviser.

442. ECONOMIC HISTORY OF THE UNITED STATES 3 hours
Economic life in colonial America and the east-west migration; the development of modern business and industry in the United States; the corporation and its part in the nation's growth; the causes and consequences of the Great Depression. Prerequisites: 500-202 and 203. Offered alternate years.

443. HISTORY OF ECONOMIC THOUGHT 3 hours
The development of economic thought from Greek and Hebrew writers to
modern economists; Adam Smith, Malthus, Ricardo, Marx, Marshall, Keynes, and modern economists. Prerequisites: 500-202 and 203.

490. SPECIAL TOPICS IN ECONOMICS 1-3 hours

494. SEMINAR IN ECONOMICS 1-3 hours

497. INDEPENDENT STUDY IN ECONOMICS 1-3 hours
An exploration indepth of a subject of special interest to both the student and faculty member. Class hours by arrangement. Permission must be obtained in writing from the faculty mentor, and the dean of the college prior to registration. Prerequisites: Junior standing and approval of the instructor. Restricted enrollment.

FINANCE

354. FINANCIAL INSTITUTIONS 3 hours
Managerial policies and decision making concepts of commercial banks, savings and loan associations, mutual savings banks, and other financial institutions. Prerequisites: 500-133, 100, and 203.

362. MANAGERIAL FINANCE 3 hours
(Formerly corporation finance) Handling and flow of funds; problems of fixed and working capital, income level, dividend policy and the use of borrowing. Case analysis is used. Prerequisite: 500-100 and 133.

374. CAPITAL INVESTMENTS AND FINANCIAL DECISIONS 3 hours
The student is provided with an opportunity to undertake an in-depth examination of specialized decisions facing the financial manager. The concept of capital budgeting is extended to include leasing and applications of the Capital Asset Pricing Model. Dividend policy is examined in the context of perfect and imperfect financial markets. Prerequisite: 500-362.

421. INTERNSHIP IN FINANCE 6 hours
Field experience in finance. Prerequisites: Finance major and senior standing. Six hours of CBA electives may be taken in place of this course.

422. INTERNSHIP IN FINANCE 6 hours
Field experience in finance. Prerequisites: Finance major and senior standing. Six hours of CBA electives may be taken in place of this course.

461. INVESTMENTS 3 hours
Problems of investment policy; types of investment risks, the analysis of investment requirements, and types of investment policies. Problems of both individual and institutional investors are analyzed. Prerequisite: 500-362. Offered alternate years.

463. RISK MANAGEMENT 3 hours
The scope and purpose of risk management in business; identification and measurement of exposure to loss; analysis of insurance contracts and operations; an explanation of the problems of personal risk management; public policy issues such as governmental regulation of insurers and social insurance. Prerequisites: 500-362 and junior standing.
494. SPECIAL TOPICS IN FINANCE  1-3 hours
Prerequisites: Variable. Consult adviser.

500. INDEPENDENT STUDY IN FINANCE  1-3 hours
An exploration in depth of subject of special interest to both the student and the faculty member. Class hours by arrangement. Prerequisites: junior standing and approval of the faculty member. Restricted enrollment. Permission to enroll must be obtained in writing from the faculty-mentor and the dean of the college prior to registration.

MANAGEMENT

291. SPECIAL TOPICS IN MANAGEMENT  1-3 hours

325. MANAGEMENT/LABOR-LAW  3 hours
The relationship of management and labor under existing laws including such areas as labor organizational drives, union representation elections, strikes, boycotts, picketing, collective bargaining, arbitration, and fair labor standards. Prerequisite: 500-322.

330. PRINCIPLES OF MANAGEMENT  3 hours
The organization of firms. Modern management methods, decision making processes, procedures, physical equipment and standards. Organization and managerial relationships of major industrial functions.

335. MANAGEMENT ORGANIZATIONAL BEHAVIOR  3 hours
A study of the human factors in organizations. Emphasis placed on the contributions of the behavioral sciences to the inner workings of business firms. Topics covered are historical foundations, motivation, job satisfaction, bureaucratic structures, leadership and its development, group dynamics, social issues, communication, and international organizational behavior. Prerequisite: 500-330.

363. PERSONNEL MANAGEMENT  3 hours
The functions of the personnel department in industry. Case analysis of problems of selection, training and incentives; the human factor in industry. Prerequisite: 500-330.

364. PRODUCTION AND OPERATIONS MANAGEMENT  3 hours
An introduction to the major issues and analytical problem solving techniques existing in the field of production and operations management. Prerequisites: 500-362 and 330; 123-143 or 155; and junior standing.

365. HUMAN RELATIONS IN BUSINESS  3 hours
A study of the importance of human relationships in business and the primary role of attitudes in determining the success or failure of an enterprise. Emphasis is given to case studies, supplemented with textual materials and visual presentations depicting contemporary work situations faced by workers and managers. Prerequisite: 500-330.

410. BUSINESS AND SOCIETY  3 hours
Analysis of the complex and dynamic interrelationships between business
and society through a study of the social, cultural, legal, ethical, economic and technological issues, philosophies and points of view which influence business. Topics discussed will include corporate responsibility, individual rights and multi-national business. Prerequisites: 500-330 and 335.

425. INTERNSHIP  1-15 hours
Field experience in management. Consult adviser.

474. SMALL BUSINESS MANAGEMENT  3 hours
A survey of the importance of small business, its current status, problems encountered and requirements for successful operations. Emphasis being given to problem solving techniques for small businesses. Prerequisites: 500-322, 362, 330, and 351; 123-143 or 155.

485. BUSINESS POLICIES AND CENTRAL MANAGEMENT  3 hours
Senior seminar designed to provide the student with a greater awareness of the business enterprise as a whole and of the total circumstances faced by management at all levels in a variety of types of firms. Presented on a case study basis and designed for the application of advanced analytical problem solving techniques. Prerequisites: 500-322, 362, 202, 203, 330, and 351.

491. SPECIAL TOPICS IN MANAGEMENT  1-3 hours

495. SEMINAR IN MANAGEMENT  3 hours

498. INDEPENDENT STUDY IN MANAGEMENT  1-3 hours
An exploration in depth of a subject of special interest to both the student and the faculty member. Hours by arrangement. Prerequisites: Junior standing and approval of the instructor. Restricted enrollment. Permission to enroll must be obtained in writing from the faculty-mentor and the Dean of the college prior to registration.

MARKETING

351. MARKETING  3 hours
Management-oriented; concepts, processes, and problems of marketing; channels of distribution, marketing research, brands and price policies.

371. SALESMANSHIP  3 hours
The principles, techniques and problems of salesmanship, sales management, recruiting, controlling and evaluating a sales force; marketing research techniques, pricing and contemporary channels of distribution. Prerequisite: 500-351.

372. ADVERTISING  3 hours
Advertising as an integral part of the marketing process; selling appeals and types of advertising; consideration of copy and media; problems of publishing and broadcast advertising. Prerequisite: 500-351.
373. LOGISTICS 3 hours
Water, railway, highway, pipeline and air transportation and their development in the U.S.; rates and their effect on location and development of industry; government regulations; and labor relations. Prerequisites: 500-330 and 351.

375. MERCHANDISING 3 hours
Retail store location and layout, merchandise assortment, promotion and price policies, research in management theory, cost and expense analysis. Prerequisite: 500-351.

376. INDUSTRIAL MARKETING 3 hours
A study of the basic industrial marketing system as distinguished from consumer marketing. The demand for industrial goods and the nature of the consumer is analyzed in detail. Topics discussed will include characteristics of manufacturer's goods, channels of distribution, pricing, vendor and value analysis, industrial buying, industrial advertising and meeting product specifications. Prerequisite: 500-351.

420. INTERNSHIP 5 hours
Field experience in marketing. Consult adviser.

434. MARKETING RESEARCH 3 hours
Research design, data collection methods, sampling techniques, tabulation and analysis of information concerning problems in marketing. Prerequisite: 500-351.

451. ADVANCED MARKETING 3 hours
Marketing decision making, interacting with the various functions of marketing to better develop marketing strategies by defining target markets and constructing marketing mixes. Prerequisites: 500-351, 375, 434, 330, and 362; senior standing.

452. SEMINAR IN MARKETING 3 hours
Readings in marketing pertaining to case histories and current situations. Prerequisite: 500-351.

493. SPECIAL TOPICS IN MARKETING 1-3 hours

498. INDEPENDENT STUDY IN MARKETING 1-3 hours
An exploration in depth of a subject of special interest to both the student and the faculty member. Hours by arrangement. Prerequisites: Junior standing and approval of the instructor. Restricted enrollment. Permission to enroll must be obtained in writing from the faculty-mentor and the Dean of the college prior to registration.
THE THOMAS JEFFERSON SMULL
College of Engineering
Lawrence H. Archer, Dean

Academic Accreditation and Association
The Accreditation Board for Engineering and Technology (ABET), previously known as the Engineers’ Council for Professional Development, the only official accrediting agency for engineering curricula, has accredited all of the curricula in the College including the departments of civil, electrical, and mechanical engineering. The College is a member of the American Society for Engineering Education and is recognized by the Ohio Board of Registration for Professional Engineers and Surveyors.

Objectives
The College attempts to teach its students to think in a logical sequence given certain facts. The College follows the objectives of the University in developing the student as a whole individual who will be successful and creative in their profession as well as in their personal life. In the College students attain the highest undergraduate proficiency in subject matter basic to all engineering and in the essentials of their chosen branch of the engineering profession.

History and Tradition
In 1871 the first catalog of the University included a course in surveying. A department of Civil Engineering was organized in 1880 with its first graduate in 1882, Electrical Engineering in 1898, and Mechanical Engineering, in 1904. Over 3,600 engineers have graduated from the Thomas Jefferson Smull College of Engineering in its 100-year history. These departments continue to meet the highest standards of engineering excellence.

The tradition of the College is to treat each student as an individual, to keep class size at a minimum, and to maintain a close faculty-student relationship.

Admission Standards
Early application is advisable. As early as the junior year of high school the student interested in engineering is encouraged to obtain advice on program of study from the dean of the College and to request appropriate information and application materials from the Office of Admissions, Ohio Northern University, Ada, Ohio 45810.

In addition to the general requirements for admission to the University stated in this catalog, high school graduates and non-graduates have 16
acceptable units of work and of good moral character. Ten of these units are as follows: 4 units in English; 4 units in mathematics (2 units in algebra, 1 unit in geometry, and at least ½ unit in trigonometry or its equivalent); and 2 units in science (1 unit in physics and preferably 1 unit in chemistry). The College recommends but does not require that applicants have two units of a foreign language.

Students who meet the admission standards of the University but are deficient in the mathematics or physics requirements of the College will be required to make up their deficiency. The College recommends that prospective students make up their high school deficiencies before entering as freshmen. An additional summer quarter or even a fifth year may be necessary for those students who do not meet this requirement before they enter as freshmen.

Transfer students from other accredited universities or colleges may be admitted with advance standing if they have an honorable dismissal and are eligible to return to the universities or colleges they previously attended. Transfer students who conceal their previous college attendance will have their admission to the College revoked. The College will not accept from transfer students more than 150 quarter hours or their equivalent. Transfer work must be "C" or better.

The dean admits special students who are non-degree candidates if, after a personal interview, it is determined that they are sufficiently prepared to pursue engineering courses successfully. Special students who satisfactorily complete their work are awarded a certificate indicating the course of study pursued and the amount of work covered.

Academic Loads

Each department in the College lists quarter by quarter the standard course load for a student. The normal maximum load is that which is listed by the department for that quarter at that level or eighteen hours whichever is largest. The dean, upon recommendation of the student's adviser, may permit a student to enroll for extra hours. The normal requirement is an accumulative average of at least 3.0/4.0. Each engineering student is responsible for fulfilling the requirements for the current year's catalog as they apply to that year of the program.

Academic Status

A student is in good academic standing when the accumulative grade point average is at least 2.0 or when it has been granted by the petition process.

A student is placed on academic probation the first time the accumulative grade point average falls below 2.0. Normally one quarter is given to raise the accumulative average to an acceptable level. Students may be on probation two successive quarters if conditions and evidence indicate that the student is improving academically.

Students who consistently attain a low accumulative average (below 2.0) or extremely low scholarship in a given quarter are subject to suspension, which implies the possibility of readmission at a later date, usually after three quarters.
Students having academic difficulty are required to meet frequently with their adviser. A student on probation is not eligible to participate in extracurricular activities. The dean makes some exceptions based upon the recommendation of the student’s adviser and the director of the activity. The dean treats each student on probation individually. It is the obligation of the student on probation to initiate the petition process for regaining eligibility to participate in extracurricular activities.

**Classification**

The traditional designations of freshman, sophomore, junior, and senior are used by the College. The engineering curricula are vertical insofar as most courses are taken in sequence. The level at which a student is studying is far more consequential than the hours accumulated or the years spent in school. Each student is required to complete designated courses before advancing to the next student classification. In general, the classification doesn’t change during the year once it has been determined at the start of the year.

**Graduation and Degrees**

A student qualifies for graduation by meeting specific course requirements as listed in the catalog year by year for the specific program at specific levels and by earning a minimum of 200 academic hours. In addition a student also needs a scholarship rating of at least two quality points for each credit hour scheduled with an accumulative grade point average of 2.0 in all engineering courses. Only one degree at a time, with the exception of the Arts-Engineering program, may be earned.

All degree candidates are required to spend their senior year in academic residence, taking at least 45 quarter hours of upper level engineering courses.

At commencement engineering students receive the bachelor of science degree in either civil, electrical, or mechanical engineering. The options are shown on the academic transcript but not on the diploma.

**Registration as a Professional Engineer**

Registration as a Professional Engineer by the state, necessary for professional practice, requires licensing examinations and four years of experience after completing the bachelor of science degree. The dean gives full information to students in their freshman and senior years. Students may also write the Secretary of the Board of Registration for Professional Engineers, 65 South Front Street, Room 302, Columbus, Ohio 43215.

**Engineering Graduates and Law School**

Graduating seniors of the Thomas Jefferson Smull College of Engineering with at least a 3.3/4.0 accumulative average who wish to enter the Pettit College of Law at Ohio Northern University are admitted automatically. However, the Law School Admission Test (LSAT) is required.
The Robert W. Biggs Engineering Building
The College occupied its present facility in 1971. Located in this 1.8 million dollar structure are 91 rooms including classrooms, laboratories, computer center, and faculty offices. The addition of the Robert W. Biggs Engineering Building to the campus completed the science complex on what has come to be known as the West Campus.

Pre-Engineering Curricula
Since the first two years of any particular curriculum in engineering at many universities are practically the same, the College offers pre-engineering in most fields. The pre-engineering curricula are flexible enough to conform to the catalog requirements of the university the student has chosen to attend after completing the pre-engineering program. All pre-engineering students are enrolled in the College of Engineering and have an adviser on the engineering faculty.

Arts-Engineering Curricula
Superior students may qualify to pursue the arts-engineering program. Students are admitted to both the College of Arts and Sciences and the College of Engineering and in five academic years two degrees, a bachelor of arts degree from the College of Arts and Sciences and a bachelor of science degree in the appropriate branch of engineering from the College of Engineering are earned. The attraction of the dual degree program is that a student is free to major in any liberal arts area and in any branch of engineering. A student who desires to work in a foreign country or for an American company in a foreign country may major in the appropriate foreign language. The superior student enrolled in the arts-engineering program will come to understand more fully the role of the humanities and civilization in a scientific and engineering world; and his service to mankind will increase. He will also help create a broader image of the engineer in our age.

The program which follows allows a student to choose from at least eight of the 26 areas of concentration in the College of Arts and Sciences. By judiciously scheduling hours in the liberal arts major or selecting the appropriate area of concentration, the student increases the major hours from 45 to 51 and the 26 areas become available in the College of Arts and Sciences.

<table>
<thead>
<tr>
<th>ARTS-ENGINEERING PROGRAM</th>
<th>(F)</th>
<th>(W)</th>
<th>(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English (112107-8-9)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>calculus 1, 2, 3 (123163, 261-2)</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>chemistry, biology (122171, 121100), fine arts</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>language, education (113100, 141100)</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>freshman seminar (201120), social sciences</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>physical education</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>19</td>
<td>18</td>
</tr>
</tbody>
</table>
## Second Year

<table>
<thead>
<tr>
<th>Course</th>
<th>(F)</th>
<th>(W)</th>
<th>(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>calculus 4, 5, diff. eqs. (123263-4, 361)</td>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>physics, 1, 2, 3 (124231-2-3)</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>arts-sciences sem., graph. anal. 1,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>creative design* (201112-4)</td>
<td>Au</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>program in basic, engr. problems</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>(123111, 201122)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>arts-sciences major</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>fine arts, fine arts in-depth 1, 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>social science</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>20</td>
<td>19</td>
<td>18</td>
</tr>
</tbody>
</table>

## Third Year

<table>
<thead>
<tr>
<th>Course</th>
<th>(F)</th>
<th>(W)</th>
<th>(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>engr. mech. 1, 2, 3 (201311-2-3)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>p&amp;a circuits 1, 2, 3 (201321-2-3)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>p&amp;a laboratory 1, 2 (201332-3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>arts-sciences major</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>soc. sci. in-depth, religion, philosophy</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>humanities in-depth 1, 2, soc. sci. in-depth</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>18</td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>

## Fourth Year

<table>
<thead>
<tr>
<th>Course</th>
<th>(F)</th>
<th>(W)</th>
<th>(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>arts-sciences major</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>plus junior courses in appropriate</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>engineering department</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Fifth Year

<table>
<thead>
<tr>
<th>Course</th>
<th>(F)</th>
<th>(W)</th>
<th>(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>arts-sciences major</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>plus senior courses in appropriate</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>engineering department</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*graphical analysis 2 (201113) may be substituted for creative design.*

## Basic Engineering

No sharp line of distinction is drawn in the fundamental education of civil, electrical, or mechanical engineers for the reason that the sciences basic to engineering—mathematics, physics, chemistry, and the engineering sciences—are essential in all branches of engineering. Since certain courses in engineering are considered to be fundamental and deal with the basics of the several fields, they are used by all three departments in at least the first two years of the curriculum. The basic courses are taught by the engineering faculty and are required of all engineering students.
ENGINEERING OPTIONS

Management, Computer Science and Public Administration

Besides the regular degree programs in civil, electrical, and mechanical engineering, interdisciplinary programs have been developed in Management, Computer Science, and Public Administration. These option programs work equally well with any one of the three degree programs.

This is accomplished by proper planning and judicious use of the social science electives, the free electives, and the science electives. Further, it is accomplished without a sacrifice in the engineering content of the three degree programs. It is essential for the student on an option to follow the program as designated in order to avoid conflicts.

Any student may select one of the interdisciplinary programs as an adjunct to the engineering degree program with the approval of the appropriate chairman and the dean. A minimum of two hundred nine (209) to two hundred sixteen (216) hours is required for graduation including at least thirty-three (33) hours in the option. The diploma does not indicate the option but the official transcript does carry the appropriate option designation. Since the loads are a little heavier than normal quarter loads the student needs to institute the plan at the start of the freshman year at Ohio Northern University.

Courses in the Management Option include Accounting, Psychology, Economics, Principles of Management, Business Law, Managerial Finance, and a Business Elective, totaling thirty-three (33) hours.

In the Computer Science Option courses included are Programming in Basic, Fortran, Intermediate Programming, Introduction to File Processing, Assembly Language Programming, Introduction to Computer Organization, Operating Systems and Computer Architecture I, Data Structures and Algorithm Analysis, and Organization of Programming Languages for a total of thirty-three (33) hours.

The option in Public Administration includes thirty-three (33) hours in Economics, Accounting, Urban Economics, National Government, State and Local Government, Public Administration, and Urban Politics.

---

ALL ENGINEERING—CLASS OF 1986

FRESHMAN 1982-83

<table>
<thead>
<tr>
<th>Course</th>
<th>(F)</th>
<th>(W)</th>
<th>(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>English (112107-8-9)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>calculus 1, 2, 3 (123163, 261-2)</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>freshman sem., physics 1, 3 (201120, 124231-3)</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>program in basic, engr. prob. (123111, 201122)</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>graph. anal. 1, creative design* (20112-4)</td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>social science elective</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>physical education (143001-2-3)</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Totals</td>
<td>15</td>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>

*graphical analysis 2 (201113) may be substituted for creative design.
ALL ENGINEERING—CLASS OF 1985

SOPHOMORE 1982-83

<table>
<thead>
<tr>
<th>(F)</th>
<th>(W)</th>
<th>(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>calculus 4, 5 diff. eqs. (123263-4, 361)</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>physics 2, chemistry, science elective*</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>(124232, 122162, …)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>social science elective**</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>engr. mechanics 1, 2, 3 (201311-2-3)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>p&amp;a circuits 1, 2, 3 (201321-2-3)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>circuits lab. 1, 2 (201332-3)</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Totals</td>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>

*Examples of acceptable science electives: Chemistry 163, Biology 100-12-13, Nuclear Physics 353, Modern Physics 303, Operations Research 332.

**Only four (4) of the five (5) social science electives to this point are required.

BASIC ENGINEERING: DESCRIPTIONS

(Department 201)

100. PRE-ENGINEERING MATHEMATICS REFRESHER 0 hours
A review of those portions of high school mathematics necessary to start college mathematics. Topics included are algebra, geometry, trigonometry, and analytical geometry. Students who do not place sufficiently high in mathematics placement tests during the summer orientation are required to take this course to prepare to start calculus. Offered the two weeks prior to the opening of Fall Quarter.

112. GRAPHICAL ANALYSIS 1 (1 + 3) 2 hours
An introduction to graphical communications, analysis, and design, including: the development of the ability to convey ideas by the use of engineering sketches; the construction of professional drawings; and graphical representation of data.

113. GRAPHICAL ANALYSIS 2 (1 + 3) 2 hours
Advanced study in mechanical drawing techniques, and an introduction to computer graphics. Prerequisite: 201-112, 122 concurrently.

114. CREATIVE DESIGN (0 + 4) 2 hours
Participation in student-generated group design projects emphasizing engineering methodology, design, analysis and communicative skills. Prerequisite: 201-112.

120. FRESHMAN SEMINAR FOR ENGINEERING 1 hour
STUDENTS (1 + 0)
Schedules, irregularities in schedules, graduation requirements, class preparations, problem solutions, taking of tests, background of various branches of engineering, technical and professional organizations and professionalism are covered. Designed to help the student to make the transition to college, as well as properly orient the student in the profession.
122. ENGINEERING PROBLEMS (3 + 0)  3 hours
Engineering problem solving with the computer using FORTRAN. The approach centers around fundamental problems of general engineering interest. Prerequisite: 123-111 or permission.

291. INDEPENDENT STUDY AND PROJECTS  1-3 hours
Independent planning of an engineering or engineering-related project or independent study at the freshman level on topics of particular interest to the student and approved by the faculty. Prerequisite: Permission.

292. INDEPENDENT STUDY AND PROJECTS  1-3 hours

293. INDEPENDENT STUDY AND PROJECTS  1-3 hours

311. ENGINEERING MECHANICS 1 (3 + 0)  3 hours
Fundamental principles of statics with vector methods. Emphasis on free body diagrams and equations of equilibrium. Topics include: resultants of force systems, centroids and centers of gravity, equilibrium, friction, moment of inertia, and kinematics. Use of S.I. Prerequisite: 123-262, 124-231.

312. ENGINEERING MECHANICS 2 (3 + 0)  3 hours
Fundamental principles of mechanics with vector methods as applied to dynamics. Topics include: absolute and relative motion; force, mass and acceleration; work and energy; and impulse and momentum. Use of S.I. Prerequisite: 201-311.

313. ENGINEERING MECHANICS 3 (3 + 0)  3 hours
Elastic analysis through concepts of stress and strain, tension, torsion, compression and flexure. Development and application of Mohr's circle construction; analytical methods of determining shear stresses in beams subjected to torsional and flexural loadings, shear and moment diagrams. Use of S.I. Prerequisite: 201-311.

321. PASSIVE AND ACTIVE CIRCUITS 1 (3 + 0)  3 hours
Introductory concepts in circuit analysis. Solution of resistive circuits using Ohm's and Kirchof's Laws, mesh and nodal analysis, and network theorems. Prerequisite: 123-262, 124-233 or permission.

322. PASSIVE AND ACTIVE CIRCUITS 2 (3 + 0)  3 hours
Analysis of circuits in the sinusoidal steady-state. Phasor solution, effective values of current and voltage, and instantaneous and average power. Prerequisite: 201-321.

323. PASSIVE AND ACTIVE CIRCUITS 3 (3 + 0)  3 hours
Magnetically coupled circuits, polyphase circuits and Fourier analysis. Prerequisite: 201-322.

332. CIRCUITS LABORATORY 1 (0 + 3)  2 hours
A laboratory study of electric circuits. Prerequisite: 201-321, 201-332 concurrently.
333. CIRCUITS LABORATORY 2 (0 + 3) 2 hours
Continuation of 332. Prerequisite: 201-332.

391. INDEPENDENT STUDY AND/OR PROJECTS 1-3 hours
Independent planning of an engineering or engineering-related project or independent study at the sophomore level on topics of particular interest to the student and approved by the faculty. Prerequisite: permission.

392. INDEPENDENT STUDY AND/OR PROJECTS 1-3 hours
Continuation of 391.

393. INDEPENDENT STUDY AND/OR PROJECTS 1-3 hours
Continuation of 392.

401. APPLIED RANDOM PROCESSES (3 + 0) 3 hours

CIVIL ENGINEERING DEPARTMENT

Professors Milks (Chairman), Minich, Shah; Assistant Professor Smalley.

Civil engineering deals with the design, construction, operation, and impacts of man's civil works. Consequently, the quality of its graduates is a major factor influencing the health, safety, and life quality enjoyed by the nation's citizenry. The practice of civil engineering requires a broad background in the biological, chemical, geological, mathematical, and physical sciences; and understanding of social value systems, human behavior, and our cultural heritage; and in-depth education in the traditional civil engineering discipline.

Department facilities include instruments and equipment in functional laboratories. Laboratory work is offered in testing materials, concrete, soils, geology, fluid mechanics, environmental engineering, and hydraulics, as well as field work in surveying.

CIVIL ENGINEERING—CLASS OF 1984

<table>
<thead>
<tr>
<th>JUNIOR 1982-83</th>
<th>(F)</th>
<th>(W)</th>
<th>(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mechanics of materials, law &amp; management*, geology (202401, 442, 453)</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>computer aided design, structural analysis, 1, 2 (202411-2-3)</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>humanities or social science elective, fluid mechanics, hydraulics (..., 202422-3)</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>surveying, transportation, urban planning (202301, 435-6)</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>philosophy, applied random processes, material science (..., 201401, 202456)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Totals</td>
<td>17</td>
<td>16</td>
<td>18</td>
</tr>
</tbody>
</table>
CIVIL ENGINEERING—CLASS OF 1983

SENIOR 1982-83
environmental engineering 1, 2 (202514-6) 3 4
steel design 1, 2, structural
   systems design* (202547-8, 523) 4 3 3
soils, 1, 2, construction systems (202531-2, 533)* 4 5 3
reinforced concrete 1, 2 (202526-6) 4 3
CE seminar*, finite elements* (202551, 555) 3 3
religion, technical elective*, elective 3 3 3
Totals 17 18 16

*These technical electives may have substitutions including environmental science 202473 or any engineering or science course which in the opinion of the civil engineering faculty does not duplicate the content of a course already taken.

CIVIL ENGINEERING: DESCRIPTIONS
(Department 202)

Civil engineering courses use laboratory facilities as needed. The number of recitations and laboratory hours per week is an approximate average over the quarter and will vary with immediate class content.

301. SURVEYING (2 + 6)
Use of level, transit and tape, differential and profile leveling, traversing theory and practice, horizontal and vertical curves, and mapping. Prerequisite: permission.

401. MECHANICS OF MATERIALS (3 + 0)
Deflection, combined loadings, repeated loading, dynamic loading, connections, formulation of statically indeterminate problems. Prerequisite: 201-313.

411. COMPUTER AIDED DESIGN 1 (3 + 3)
Principles of numerical analysis used in solving structural problems, numerical methods, linear programming, optimization, and applications. Prerequisites: 201-122, 123-111, 123-361, and concurrently with 202-401.

412. STRUCTURAL ANALYSIS 1 (3 + 3)
Fundamentals of statically determinate structures; deflections, displacements, use of models to illustrate structural behavior, principle of superposition and study of elastic curve, computer methods. Prerequisite: 202-411.

413. STRUCTURAL ANALYSIS 2 (3 + 3)
Fundamentals of statically indeterminate structures; classical and approximate methods of solution, computer aspects. Prerequisite: 202-412.

422. FLUID MECHANICS (2 + 3)
Engineering properties of fluids, fluid statics, fluid dynamics, fluid resistance, boundary layer theory, steady flow in pipes. Prerequisite: 201-312.
423. HYDRAULICS (3 + 3) 4 hours
Hydraulic analysis of piping systems, steady flow in open channels, non-uniform flow in open channels, elements of hydrology, introduction to chemical quality of surface and subsurface waters, and design of water distribution systems. Field trip when appropriate. Prerequisite: 202-422.

435. TRANSPORTATION (3 + 0) 3 hours
Principles of transportation systems; economics, finance, and planning; and design, construction and maintenance. Field trip when appropriate. Prerequisite: Permission.

436. URBAN PLANNING (2 + 3) 3 hours
Principles of city and regional planning; land use, zoning, housing codes, subdivision regulations, metropolitan problems, and urban development. Field trips when appropriate. Prerequisite: permission.

442. LAW AND MANAGEMENT (3 + 0) 3 hours
Present and emerging legal issues concerning various aspects of the Civil Engineering profession. The organization, management and control of a business enterprise. Organization and management systems. Prerequisite: junior standing.

453. GEOLOGY (3 + 3) 4 hours
Principles of physical geology. Physical and chemical properties of minerals and rocks, geologic processes, earth materials, processes of erosion and deposition, terrain investigation, geological mapping, ground water hydrology. Field trips when appropriate. Prerequisite: permission.

456. MATERIALS SCIENCE (3 + 0) 3 hours
A study of the fundamental physical and chemical properties of engineering materials and how they relate to mechanical behavior. Determination of physical properties in laboratory environment. Prerequisite: 201-313.

473. ENVIRONMENTAL SCIENCE (3 + 0) 3 hours
Environmental pollution: effects on society. Causes, controls and standards of water, air and land pollution. Possible solutions using interdisciplinary approach. Field trip when appropriate. Prerequisite: Permission.

491. INDEPENDENT STUDY 1-3 hours
The independent planning of an engineering design project by individual study of a topic of particular interest to the student. Prerequisite: junior status and departmental contract in advance.

492. INDEPENDENT STUDY 1-3 hours

493. INDEPENDENT STUDY 1-3 hours

514. ENVIRONMENTAL ENGINEERING 1 (2 + 3) 3 hours
Development of sources of water supply; determination of quantity of storm
water; design of physical processes in water and waste water treatment systems. Field trips when appropriate. Prerequisite: 202-423.

516. ENVIRONMENTAL ENGINEERING 2 (3 + 3) 4 hours
Physical, chemical and biological processes in water and waste water treatment systems. Design of a treatment system. Land and air pollution; control and standards; interpretation of reports; inspection of local plants. Solid waste management. Field trips when appropriate. Prerequisite: 202-514.

523. STRUCTURAL SYSTEMS DESIGN (2 + 3) 3 hours
Design of structural systems emphasizing optimization, creativity, and decision making. Field trips when appropriate. Prerequisites: 202-525, 547.

525. REINFORCED CONCRETE 1 (3 + 3) 4 hours
Strength design of structural elements, flexural reinforcement development, diagonal tension, axially and eccentrically loaded columns, torsion, walls, footings; application of codes and specifications to design. Field trips when appropriate. Prerequisite: 202-413.

526. REINFORCED CONCRETE 2 (2 + 3) 3 hours
Continuity, slabs, deflections, and economic considerations. Field trips when appropriate. Prerequisite: 202-525.

531. SOILS 1 (3 + 3) 4 hours
An introduction to soils engineering, physical properties of soils as affecting engineering design and construction, soil sampling, mechanics of soil masses, consolidation, settlement, and laboratory soil tests. Field trips when appropriate. Prerequisites: 202-423, 453.

532. SOILS 2 (4 + 3) 5 hours
Analysis of stress conditions imposed on the supporting soils by foundations. Design of foundations, retaining structures and slopes. Field trips when appropriate. Prerequisite: 202-531.

533. CONSTRUCTION SYSTEMS (2 + 3) 3 hours
Specifications, economical construction methods, determination of critical path, fundamentals of PERT, engineering economics as applied to various engineering projects. Field trips when appropriate. Prerequisite: Permission.

547. STEEL DESIGN 1 (3 + 3) 4 hours
The design of beams, columns, built-up members, and connections as applied to structural steel. Use of influence lines and various other techniques for determining maximum loadings. Field trips when appropriate. Prerequisite: 202-413.

548. STEEL DESIGN 2 (2 + 3) 3 hours
Theory of plastic design, load and resistance factor design, design of connections, plate girders, composite design, and fatigue. Mathematical simulation and optimization. Prerequisite: 202-547.
551. CIVIL ENGINEERING SEMINAR (3 + 0) 3 hours
Current topics of interest generally not covered in prescribed curriculum. Active participation in class discussions required. Field trips when appropriate. Prerequisite: permission.

555. FINITE ELEMENT ANALYSIS 3 hours
Study of finite element technique and selected topics in advanced structural mechanics. Prerequisite: Permission.

591. INDEPENDENT STUDY 1-3 hours
The independent planning of an engineering design project or the individual study of a topic of particular interest to the student. Prerequisites: senior, status and departmental contract in advance.

592. INDEPENDENT STUDY 1-3 hours

593. INDEPENDENT STUDY 1-3 hours

ELECTRICAL ENGINEERING DEPARTMENT

Professors Johansen (Chairman), Klingenberger, Stahl; Associate Professor Guentzler; Assistant Professor Herr.

Electrical engineers have long pioneered the fields of power, automatic control, communications, and computers. Without controlled electricity, industry as we know it today could not exist. The ever expanding use, in the non-industrial as well as the industrial world, of electrical means for measurement, control, and computation has resulted in the need for electrical engineers in a variety of diverse and rapidly expanding areas—research institutes, developmental laboratories, manufacturing facilities, government service, medical facilities, computing centers, utility companies, consulting firms, etc. They become involved in a great diversity of problems, some quite remote from the physics of electricity and many of great social importance.

The electrical engineering curriculum coordinates scientific background with theoretical working knowledge. This curriculum is designed to provide an excellent background for students who intend to pursue employment in the above mentioned areas immediately upon graduation or who intend to pursue specialized work in graduate school.

Classroom activities are supplemented by work in well equipped laboratories. Problem solving is emphasized and particular attention is placed upon the use of the analog and digital computers which are readily available in the engineering building.
ELECTRICAL ENGINEERING—CLASS OF 1984

JUNIOR 1982-83

<table>
<thead>
<tr>
<th>Course Description</th>
<th>(F)</th>
<th>(W)</th>
<th>(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>engineering analysis, field &amp; waves, 1, 2</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>(203401, 412-3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>electronics 1, 2, 3 (203424-5-6)</td>
<td>4</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>energy conversion 1 (203433)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>applied random processes, linear systems 1, 2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>(201401, 203442-3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>solid state electronics, anal. comp. tech</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>(203455, 463)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>electrical engineering lab 1 (203471)</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>electrical engineering lab 2, 3, 4 (203481-2-3)</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>philosophy, religion (..., ...)</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>16</td>
<td>18</td>
<td>15</td>
</tr>
</tbody>
</table>

ELECTRICAL ENGINEERING—CLASS OF 1983

SENIOR 1982-83

<table>
<thead>
<tr>
<th>Course Description</th>
<th>(F)</th>
<th>(W)</th>
<th>(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>microwave theory, engr. methods I, II</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>(203511-502, 3...)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EE electives</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>energy conversion 2, EE elect. (203531, ..., ...)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>control systems 1, tech. elect. (203541, ..., ...)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>non-EE elect. (..., ...)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>electrical engineering lab 5, 7 (203561, 572)</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>electrical engineering lab 6 (203571)</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>17</td>
<td>16</td>
<td>15</td>
</tr>
</tbody>
</table>

ELECTRICAL ENGINEERING: DESCRIPTIONS

(Department 203)

401. ENGINEERING ANALYSIS (4 + 0) 4 hours
Selected analytical methods with engineering applications. Emphasis is on methods using complex variables and vector calculus. Prerequisite: Mathematics 361.

404. ELECTRIC MACHINERY (3 + 0) 3 hours
A course for the non-electrical engineering student in the theory and application of electric machinery. Prerequisite: 201-323, 201-333

412. FIELDS AND WAVES 1 (4 + 0) 4 hours
Electrical phenomena from the viewpoint of electromagnetic field theory proceeding through Maxwell's equations and leading to applications in circuit theory, rotating machinery and transmission lines. Prerequisite: 203-401.

413. FIELDS AND WAVES 2 (3 + 0) 3 hours
Continuation of 412.
424. ELECTRONICS 1 (4 + 0) 4 hours
Operating principles of electronic devices (diodes, BJTs and FETs), models representing these devices, and their use in simple circuitry. Prerequisite: 201-323.

425. ELECTRONICS 2 (4 + 0) 4 hours
Large and small signal amplifiers, frequency response of amplifiers, and oscillators. Prerequisite: 203-424.

426. ELECTRONICS 3 (3 + 0) 3 hours
Introduction to the features of the design and performance of digital ICs and their use in implementing logic designs. Prerequisite: 203-425.

433. ENERGY CONVERSION 1 (3 + 0) 3 hours
The underlying principles of energy conversion. Prerequisite: 203-412.

442. LINEAR SYSTEMS 1 (3 + 0) 3 hours
Application of Laplace Transform methods to transient phenomena in linear systems. Prerequisite: 201-323, 203-401.

443. LINEAR SYSTEMS 2 (3 + 0) 3 hours
A continuation of 442. State variable techniques and digital computer solution of linear transient problems. Prerequisite: 203-442.

455. SOLID STATE ELECTRONICS (3 + 0) 3 hours
(Formerly 421) The basic principles of the internal operations of electronic devices are studied. Prerequisite: 201-323.

463. ANALOG COMPUTER TECHNIQUES (1 + 3) 2 hours
Instruction in the use and practicability of analog computer methods in engineering problem solutions. Prerequisite: 203-443 concurrently.

471. ELECTRICAL ENGINEERING LABORATORY 1 (0 + 3) 1 hour
Instrumentation and measurement circuits and techniques. Prerequisite: 201-323.

481. ELECTRICAL ENGINEERING LABORATORY 2 (0 + 3) 1 hour
(Formerly 452) Study of active devices and their associated circuits. Prerequisite: 203-424 concurrently.

482. ELECTRICAL ENGINEERING LABORATORY 3 (0 + 3) 1 hour
Continuation of 481. Prerequisite: 203-425 concurrently.

483. ELECTRICAL ENGINEERING LABORATORY 4 (0 + 3) 1 hour
Continuation of 482. Prerequisite: 203-426 concurrently.

502. ENGINEERING METHODS 1 (3 + 0) 3 hours
The basic fundamentals of engineering economics with application to electrical systems. Prerequisite: senior status.
503. ENGINEERING METHODS 2 (3 + 0) 3 hours
The professional method of dealing with engineering problems, the processes the engineer uses in practice. Prerequisite: 203-502.

511. MICROWAVE THEORY AND TECHNIQUES (0 + 3) 3 hours
A study of the principles of energy transmission using transmission lines, wave guides, and antennas. Prerequisite: 203-413.

513. CIRCUIT SYNTHESIS (3 + 0) 3 hours
Introduction to the principles of modern circuit synthesis. Prerequisite: 203-433.

524. ELECTRONICS 4 (2 + 3) 3 hours
Continuation of 426 with emphasis on micro-computer interfacing. Prerequisite: 203-426.

525. ELECTRONICS 5 (2 + 3) 3 hours
Continuation of 524 with emphasis on micro-processor implementation of logic design. Prerequisite: 203-524.

531. ENERGY CONVERSION 2 (3 + 0) 3 hours
Continuation of 433 with emphasis on direct current and alternating current machinery. Prerequisite: 230-433.

532. ENERGY CONVERSION 3 (3 + 0) 3 hours
An introduction to power systems analysis with load flow, faults and stability topics. Prerequisite: 203-531.

541. CONTROL SYSTEMS 1 (3 + 0) 3 hours

542. CONTROL SYSTEMS 2 (3 + 0) 3 hours
Lead and lag compensation. Introduction to nonlinear systems computer analysis and design. Prerequisite: 203-541.

543. CONTROL SYSTEMS 3 (3 + 0) 3 hours
Discrete systems and the z-transform method. State-space analysis of control systems. Prerequisite: 203-542.

553. LINEAR INTEGRATED CIRCUITS (3 + 0) 3 hours
Internal circuit design of linear integrated circuits and their applications. Prerequisite: 203-426.

561. ELECTRICAL ENGINEERING LABORATORY 5 (0 + 3) 1 hour
Laboratory study of feedback control systems. Prerequisite: 203-541 concurrently.
571. ELECTRICAL ENGINEERING LABORATORY 6 (0 + 3) 1 hour
(Formerly 552) Laboratory study of transmission line and microwave circuits. Prerequisite: 203-511 concurrently.

572. ELECTRICAL ENGINEERING LABORATORY 7 (0 + 3) 1 hour
(Formerly 562) Study of the generalized machine and other DC, synchronous, and induction machines. Prerequisite: 203-531.

582. COMMUNICATION THEORY (3 + 0) 3 hours
(Formerly 572) An introduction to the principles of communication theory. Prerequisites: 203-423, 443.

590. PROJECTS 1-3 hours
Independent planning and conduct of an engineering design, or development project in electrical engineering. Prerequisite: permission.

591. INDEPENDENT STUDY 1-3 hours
Individual study of a topic of particular interest to the student in electrical engineering. Prerequisite: permission.

592. SPECIAL TOPICS 1-3 hours
A study of selected topics of current interest in electrical engineering. Prerequisite: permission.

MECHANICAL ENGINEERING DEPARTMENT
Professor Burton (Chairman); Associate Professors Maier, Smith; Assistant Professors Rider, Whisler.

Mechanical Engineering is that branch of the profession of engineering which is concerned with the conversion of energy from one form to another, the design of machines, and the control of various processes. Mechanical Engineers are involved in creative design, research, development, and management. They are being challenged today, as never before, to solve many critical problems related to pollution, mass transportation and the supply of energy.

Every mechanical engineering student has the opportunity to use extensively the engineering analysis and design laboratories as well as the Computer Center. The laboratories are equipped to supplement all engineering courses. They also provide the opportunity for individual as well as group projects and limited undergraduate research.
MECHANICAL ENGINEERING—CLASS OF 1984

JUNIOR 1982-83

- mech. of materials, theory of mach. 1, 2
  (204401, 204405-6) 4 4 4
- applied random processes, thermo. 1, 2
  (201401, 204415-6) 3 4 5
- comp. graph., engr. anal., fluid mech. 1
  (204444, 204435, 26) 3 3 3
- anal. meth., engr. matls., mfg. proc.
  (204424, 02-3) 4 3 4
- philosophy, religion (..., ...)
  3 3 3
Totals 17 17 16

MECHANICAL ENGINEERING—CLASS OF 1983

SENIOR 1982-83

- mech. des. 1, 2, 3 (204511-2-3) 4 4 3
- heat transfer 1, 2, energy syst. (204521-2-6) 3 4 4
- fluid mech. 2, tech. elect.* (204534, ...)
  4 3 3
- vib. analysis, cont. syst. (204541-2) 3 5 3
- science elective** (...
  3
- electives (..., ...)
  3
Totals 17 16 16

*Acceptable technical electives—Production Engineering 204556, Operations
Research 123332, Modern Physics 124303, Nuclear Physics 124353, Electronics
124361, Finite Elements 202555.

**Acceptable science electives: Nuclear Physics 124353, Modern Physics 124303,
Electronics 124361, Operation Research 123332, Geology 202453.

MECHANICAL ENGINEERING: DESCRIPTIONS

(Department 204)

401. MECHANICS OF MATERIALS (3 + 3) 4 hours
Beam deflection-determinate and indeterminate. Combined static loading,
reversed loading, column stability, and dynamic loading. Computer solution
of mechanics problems. Use of S.I. The measurement of material properties
and the use of stress analysis techniques. Prerequisite: 201-313.

402. ENGINEERING MATERIALS (3 + 0) 3 hours
Introduction to the microscopic structure of engineering materials and its
relation to their mechanical properties. Evaluation of these properties for
material selection in design applications. Metallurgical aspects of metals in-
cluding equilibrium diagrams and heat treating. Production and classification
of ferrous, non-ferrous and nonmetallic materials. Prerequisite: 122-162.

403. MANUFACTURING PROCESSES (3 + 3) 4 hours
Introduction to contemporary material processing including molding, ma-
chining, hot and cold working. A detailed study of these processing methods
using basic machining tools and operations, casting and molding equipment, and metal forming. Laboratory work includes evaluating basic material properties, heat treatment, and processing operations. Prerequisite: 204-402.

405. THEORY OF MACHINES 1 (3 + 3) 4 hours
Analysis and synthesis of mechanisms for motion, velocity, and acceleration properties. Linkages, cams, gears, and gear trains are treated. Analytical, graphical, and computer solutions are covered. Laboratory assignments deal with analysis and synthesis. Prerequisite: 201-312.

406. THEORY OF MACHINES 2 (3 + 3) 4 hours
Continuation of 204-405. Static and dynamic force analysis in plane and space mechanisms are treated. Laboratory assignments deal with computer solutions and construction of working mechanism models. Prerequisite: 204-405.

415. THERMODYNAMICS 1 (4 + 0) 4 hours

416. THERMODYNAMICS 2 (4 + 3) 5 hours
Relations among thermodynamic properties, mixtures, chemical reactions and equilibrium. Topics in gas dynamics and turbomachines. Laboratory experience with fluid property variations, refrigeration and heat engine systems, fans and compressors. Prerequisite: 204-415.

424. ANALYTICAL METHODS (3 + 3) 4 hours
A treatment of numerical methods applicable to problems arising in engineering practice; exact and approximate solutions are investigated; finite methods are used for linear and nonlinear equation solution; ordinary and partial differential equations are treated. Prerequisites: 123-361 and 201-122.

426. FLUID MECHANICS 1 (3 + 0) 3 hours
An introduction to the mechanics of fluids; the state of stress in a static fluid; similitude and dimensional analysis; the dynamics of inviscid ideal fluids, Euler's equation, Navier-Stokes equations, Bernoulli's equation, and momentum equation. Prerequisite: 201-312.

435. ENGINEERING ANALYSIS (3 + 0) 3 hours
The professional method as it applies to the analysis of engineering problems. Emphasis is placed on learning to deal with new situations in terms of fundamental principles. Prerequisite: 123-361.

443. INTRODUCTION TO COMPUTER GRAPHICS (0 + 3) 3 hours
Practical studies involving the applications of computer graphics. Emphasis on "software" required for computer graphics with some considerations of "hardware." Programming problems oriented toward non-engineering applications. Prerequisite: 201-122 or 123-131.
444. COMPUTER GRAPHICS (2 + 3) 3 hours
Practical studies involving the application of computer graphics in industry. Studies of hardware configurations and supportive software packages. Prerequisite: junior status in Mechanical Engineering.

511. MECHANICAL DESIGN 1 (1 + 3) 4 hours
Fatigue analysis, fracture mechanics, and statistical considerations in design. Analysis and synthesis of various machine parts. Introductory design problem given. Initiation of comprehensive design project. Use of S.I. Prerequisite: 204-403, 406.

512. MECHANICAL DESIGN 2 (3 + 3) 4 hours
Analysis and synthesis of various machine parts. Design problem given. Continuation of comprehensive design project. Use of S.I. Prerequisite: 204-511.

513. MECHANICAL DESIGN 3 (1 + 6) 3 hours
Completion of the comprehensive design project of 204-511, 512. Product liability, legal problems, and ethics studied. Introduction to designing with plastics, and optimization. Prerequisite: 204-512.

521. HEAT TRANSFER 1 (3 + 0) 3 hours

522. HEAT TRANSFER 2 (3 + 3) 4 hours
Fundamentals of convection; dimensional analysis; free and forced convection; boiling, two-phase heat transfer and heat pipes. Applications to design. Laboratory reinforced study of conduction, convection, radiation and design. Prerequisite: 204-521.

526. ENERGY SYSTEMS (3 + 3) 4 hours
Heat power systems utilizing concepts of thermodynamics, fluid mechanics, and heat transfer. Examples such as solar energy and energy recuperation systems are studied along with optimization techniques. Laboratory involves conceptual system design and studies of operating systems. Prerequisite: 204-522.

534. FLUID MECHANICS 2 (3 + 3) 4 hours
Elements of potential flow, boundary layer theory and compressible fluid flow. Applications to piping systems, aerodynamics, flow measurement and turbomachinery. Concurrent laboratory experience with flow patterns, pressure and velocity profiles, pipe networks, pumps, fans and turbines. Prerequisite: 204-426.

541. VIBRATION ANALYSIS (3 + 0) 3 hours
Fundamentals of linear and nonlinear vibration of single degree of freedom, multi-degree of freedom, and continuous systems. Prerequisite: 204-406.
542. CONTROL SYSTEMS (4 + 3) 5 hours
Modeling, analysis and design of linear feedback control systems. Laplace transforms, transfer functions, frequency response and root locus techniques. Introduction to digital controls and logic. Laboratory work in analog simulation of dynamic systems and performance studies of real systems. Prerequisite: 204-424.

556. PRODUCTION ENGINEERING (3 + 0) 3 hours
An introduction to scientific organizing, standardizing, and operating principles in production engineering. Capabilities of manufacturing processes. Fundamentals of time and motion study, engineering economy, quantity and quality control, location and material flow for a manufacturing enterprise. Prerequisite: 204-403.

590. MECHANICAL ENGINEERING PROJECT 1-5 hours
Practical studies of investigations involving the application of original thought, the determination of new information and/or new application of known information or equipment. Prerequisite: senior status.
THE RUDOLPH H. RAABE

College of Pharmacy
and Allied Health Sciences

LeRoy D. Beltz, Dean

The Raabe College of Pharmacy and Allied Health Sciences at Ohio Northern University endeavors today, as in the past, to meet the high standards of education demanded by the health professions. Currently the college occupies a modern, one and one-half million dollar building designed and equipped to provide the facilities required for programs in the health-life-physical sciences.

Throughout its ninety-nine year history, the Ohio Northern University College of Pharmacy and Allied Health Sciences has played an important role in pharmaceutical education and the education of allied health professionals. Its position in pharmaceutical education in Ohio is particularly significant. Over two thousand pharmacists have been graduated by this institution and more than one-third of the registered pharmacists practicing in Ohio are graduates of the Ohio Northern University College of Pharmacy and Allied Health Sciences. Its graduates are particularly active in local, state, and national health-related organizations.

The Raabe College of Pharmacy and Allied Health Sciences is an integral part of Ohio Northern University. It is recognized and approved by the Board of Pharmacy of the State of Ohio. It is a member of the American Association of Colleges of Pharmacy and is accredited by the American Council on Pharmaceutical Education.

Bachelor of Science Degree in Pharmacy

The Bachelor of Science Degree in Pharmacy is a five year curriculum that provides a foundation in the basic sciences of pharmacy as well as a comprehensive understanding of the health care system. The curricular design includes a broad range of courses in the social sciences, physical sciences, and the humanities. Additionally there is experiential work in clinical medical settings as well as a structured externship in acute care institutions, community pharmacies and other health care settings.

For the purposes of administration the pharmacy program is divided into two major divisions; the Lower Division, consisting of the first two years (P-1 and P-2), and the Upper Division, consisting of the last three years (P-3, P-4, and P-5).
Aims and Objectives
In addition to the general objectives set forth by the University, the College of Pharmacy and Allied Health Sciences includes the following among its aims and purposes:
Preparation students to meet satisfactorily the professional and cultural standards expected of health care professionals and to carry their share of the responsibility for improvement of the quality of the health, welfare and educational services to their communities.
Counseling students in the development of self-reliance, character and ethical concepts to the end that will render safe and efficient health care services.
Acquainting students with the value of membership in local, state and national health associations and in civic, social and religious bodies of the communities in which they live.
To accomplish these scholastic, professional, and social goals, faculty counselors are available to advise students concerning their plans of study and every encouragement is offered to maintain high standards of scholarship. Participation in a reasonable number of campus activities is encouraged in the belief that such activities, properly adjusted to the student's opportunity and ability to carry them, will broaden his outlook, enrich his college experience, and add much to his preparation for life.

Admission to the College of Pharmacy and Allied Health Sciences
Persons seeking admission to the College must provide the necessary information and meet the general requirements for admission to the University as listed in that section of this catalog. Students who qualify under those standards are reviewed for final approval for admission by the Dean of the College.
Students are permitted to enter the program of the College either as high school graduates or as transfer students from other accredited colleges.

High School Graduates
It is recommended that high school graduates should have completed the college preparatory course including four years of English, three years of mathematics (algebra I and II and plane geometry) and three years of science (including biology and chemistry). Priority will be granted to students with additional credits. Students found to be deficient in these areas may be required to pursue remedial work prior to being scheduled in the regular course of study.

Transfer Students
A student desiring to transfer from another accredited college or university must present a transcript of his record at that institution and a copy of its current catalog. Approval for admission and advanced placement will be determined by the Faculty of the College upon review of the student's previous record. Full credit will be given for all work satisfactorily completed in other recognized institutions of higher learning, provided such work is
parallel to the requirements for graduation from this institution. Credit will not be allowed for a course in which the lowest passing grade was received (i.e., grade below C).

Persons who meet the requirements for admission as indicated in the preceding paragraphs are issued a Permit to Enter the College of Pharmacy and Allied Health Sciences. To enter the regular course 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 entitled to advanced standing may enter at the time approved by the Dean.

Classification of Students
Students enrolled in the Pharmacy program are classified as P-1 students until they have earned a minimum of forty-five quarter hours credit, at which point they are advanced to P-2 standing. In order to gain admission to the Upper Division and P-3 status, a student must have completed a minimum of 90 quarter hours of academic work and all of the Lower Division courses that are prerequisite to the regular third year schedule. P-4 or P-5 standing is gained when a majority of the required course work in the previous year has been completed and a minimum of 135 and 180 quarter hours of academic credit respectively, has been earned. Additionally, students whose accumulative average in their required scientific and professional courses is below 2.00 are not eligible for advancement to the P-3, P-4 or P-5 class. All required courses in the Lower Division must be completed before the student is permitted to enter the second year of the Upper Division.

Dual-Degree Program
Superior students may elect to earn an additional degree from the College of Arts and Sciences or from the College of Business Administration concurrently with the Bachelor of Science degree in the College of Pharmacy and Allied Health Sciences. The student following this option pursues both degrees simultaneously under the supervision of an adviser from the College of Pharmacy and Allied Health Sciences and an adviser selected from the department of the chosen major in that College. Tuition is charged at the College of Pharmacy and Allied Health Sciences rate and the student receives the appropriate degree in each college upon completion of all requirements.

A student taking the dual degree program must meet all of the requirements established for each degree. Certification of completion of these requirements is made by the college granting the degree.

Information relative to the procedure for declaring a second major is available in the office of the Dean of the College of Pharmacy and Allied Health Sciences.
Standards of Scholarship
A student who fails to maintain the prescribed standards of scholarship will be subject to one of the following actions, namely: (1) being placed on probation, (2) being suspended from the College or (3) being dismissed from the College.

If a student’s accumulative quality point average falls below 2.0, the student will be placed on probation. If a student on probation does not restore his quality point average during the following or any subsequent quarter, he will be subject to further academic action. A detailed procedural guide for academic action is available for the student’s perusal.

Any student with an unusually low quality point average for any quarter may be placed on probation.

Actions to suspend or dismiss a student from the College shall be initiated by the Academic Actions Committee when just cause for such action is evident.

If action is taken to suspend a student, the suspension may be for a definite period of time after which the student will be eligible to resume his studies. It may be for an indefinite period of time in which case the student’s request for readmission is considered on a low priority basis. When readmission is granted the faculty may establish certain conditions of academic performance in order for the student to remain enrolled in the College of Pharmacy and Allied Health Sciences.

If action is taken to dismiss a student, it is to be regarded as a terminal action; therefore, the student is not eligible for readmission to the College of Pharmacy and Allied Health Sciences at any time thereafter.

Requirements for Graduation
Each candidate for a degree:
1. Must be of good moral character.
2. Must have completed the required curriculum as determined by the faculty of the College of Pharmacy and Allied Health Sciences.
3. Must have earned an accumulative grade point average of 2.0 in all course work and have maintained an accumulative grade point average of 2.0 in all required professional and scientific courses.
4. Must satisfy a minimum residency requirement as established by the Dean of the College.
5. Must be recommended for the degree by a majority vote of the faculty of the University.
6. Must meet such other qualifications as the faculty may determine.

Library
The facilities of the main library of the University are at the disposal of the pharmacy students. Many of the current books and classics contributing to an appreciation of the arts and sciences are to be found there along with books, periodicals, and journals pertaining to pharmacy, medicine, and related professions. Additional printed and visual materials are available in the instructional resources center of the College of Pharmacy and Allied Health Sciences.
Community Health Services
The College of Pharmacy offers a continuum of health-care services to the community at large. Included in these services are continuing education programs for pharmacists, nurses and other health care professionals; community health education programs, especially in the area of drug abuse; medical care research services; and health planning resources. Further information can be obtained by contacting the Dean of the College.

Special Notice
Because of rapid developments in the medical and allied health professions, the curriculum of the College is constantly being reviewed by the faculty. The College reserves the right, without advance notice, to change the content, duration and sequence of any course included in the curriculum leading to the degree. A separate catalog or bulletin covering course content and other pertinent matters is issued periodically. Please address requests for copies to the Dean of Pharmacy and Allied Health Sciences, Ohio Northern University, Ada, Ohio 45810.

PROGRAM OF STUDY LEADING TO THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY

CURRICULUM

First Year:

introductory chemistry 171, 172, 173 15
biology 100 4
general biology 112, 113 8
calculus & probability 154, 155 8
introduction to data analysis 156 4
English 107, 108, 109 9
pharmacy orientation 101 1
the profession of pharmacy 102, 103 2
Total 51

Second Year:

organic chemistry 231, 232, 233 12
physiology 331, 332, 333 12
speech communication 100 3
introduction to pharmacy practice 212 3
general education* 20
Total 50
Third Year:
pharmaceutics 321, 322, 323  12
biochemistry 341, 342  8
biopharmaceutics and introductory pharmacokinetics 343  3
medicinal chemistry 371  5
immunology and biologials 372  2
microbiology 361  4
principles of disease 373  3
general education  13
elective  1
Total  51

Fourth Year:
pharmacy practice 461, 462  6
pharmacy practice laboratory 463  1
sterile products 464  2
prescription products in practice 465  1
introductory and autonomic pharmacology 491  4
pathology and pharmacology of the central nervous system 492  4
pathology and pharmacology of the cardiovascular and endocrine system 493  5
laboratory in biomedical sciences 494, 495, 496  3
chemotherapy of infectious disease 421  4
electives  24
Total  54

Fifth Year:
toxicology 521  3
pharmaceutical law 551  4
pharmaceutical marketing 552  3
pharmaceutical management 553  4
health care systems 554  3
clinical pharmacy 560  3
therapeutics 562  3
introduction to drug information 563  2
structured externship 580  15
electives  11
Total  51

*General education courses are selected from among the following:

Humanities
3 hours selected from philosophy 100, logic 234, knowledge and truth 237, ethics 237 or bioethics 238. 3 hours selected from Introduction to Religion 105, Introduction to the Bible 106, Religion East and West 107, or Introduction to Christianity 108.
Social Science
7 hours selected from psychology 100, sociology 105, or any course in department 113 at the 200 level or above. 6 hours selected from accounting 131, 132, 133; economics 100, 202, 203; or business law 322, 323, 324. 6 hours selected from political science 201, 202, 203; or recent American history 360, 362.

Fine Arts
3 hours of non-performance fine arts selected from art 100, music 100, theatre 105 or any 200 level non-performance course in department 151, 152, or 153.

In-depth General Education
6 hours selected from any English course at the 200 level or above (excluding performance courses), any philosophy and religion course at the 200 level or above (in addition to the course used to satisfy the humanities requirement), any foreign language, any sociology, psychology or social welfare course at the 200 level or above (in addition to the courses used to satisfy the social science requirement), any course in business administration at the 300 level or above, or any course in political science and history at the 300 level or above.

For descriptions of the lower division courses and general education courses turn to the listing of the courses offered in the College of Arts and Sciences and the College of Business Administration.

First number in parentheses is lecture hours per week, second number is laboratory hours per week. Multiple course listings separated with a hyphen are sequential. Courses listed with an asterisk are elective.

DEPARTMENT OF PHARMACY AND HEALTH CARE ADMINISTRATION
(Department 311)

Professors Beltz, Stansloski (Chairman), Stuart, Theodore, Vottero; Associate Professors Henderson, Previte; Assistant Professors Lucas, Malone, Padron, Reiselman, Shoemaker, Stanovich; Clinical Instructors J. Turner, M.A. Turner, Wellington.

101. PHARMACY ORIENTATION (1 + 0)  1 hour
A general orientation to the University.

102. THE PROFESSION OF PHARMACY I (1 + 0)  1 hour
The profession of pharmacy; its development, its educational requirements, the role of the pharmacist and the challenges.

103. THE PROFESSION OF PHARMACY II (1 + 0)  1 hour
Continuation of 102.
212. INTRODUCTION TO PHARMACY PRACTICE 3 hours
An introduction to the practice of pharmacy which includes practical principles of law as it pertains to pharmacy interns; Third Party Payment practices; and patient profiles. A major emphasis is placed on mathematics as applied to pharmacy practice including the prescription, Latin symbols, metrology, reducing and enlarging formulae, dilution and concentration, isotonic solutions and electrolyte solutions.

321. PHARMACEUTICS I (3 + 3) 3 hours
A study of solid dosage forms, including their preparation, characteristics, and the physical and chemical phenomena affecting the availability of the active ingredient from these dosage forms. In the laboratory, solid dosage forms are prepared, both according to the laboratory test, and extemporaneously. Prerequisites: 311-212, chemistry 233, and P3 standing.

322. PHARMACEUTICS II (3 + 3) 4 hours
A study of the various types of solution dosage forms and the related physical and chemical phenomena. These include solubility characteristics, pH considerations and their effect on solubility, stability, and compatibility. These principles are applied in the laboratory, in the preparation of homogeneous dosage forms. Prerequisites: 311-321 and P3 standing.

323. PHARMACEUTICS III (3 + 3) 4 hours
A study of heterogeneous dosage forms including suspensions, ointments, emulsions and suppositories. In the laboratory, the theoretical aspects of dispersion, interfacial phenomena, rheology and practice behavior are applied in the preparation of these dosage forms. Prerequisites: 311-322 and P3 standing.

343. BIOPHARMACEUTICS AND INTRODUCTORY PHARMACOKINETICS (3 + 0) 3 hours
The characteristics, time course, factors influencing and the mathematical models of drug absorption, distribution metabolism, and excretion. Prerequisite: P-3 standing. Corequisites: 311-323, 121-333.

353. INTRODUCTORY INSTRUMENTAL ANALYSIS 4 hours
(Instruments used in qualitative, quantitative and control analysis.

421. INTRODUCTION TO INSTITUTIONAL PHARMACY (2 + 0)
An introductory presentation of the history and organization of hospitals and the responsibilities and organization of hospital pharmacy departments, with special emphasis upon professional activities. Prerequisite: P-3 standing or permission of instructors.

422. PHARMACY SERVICE TO NURSING HOMES (1 + 0) 1 hour
The pharmacist's opportunities and responsibilities in nursing home practice. Main emphasis on consulting and distribution functions which include se-
lecting a drug distribution system, conducting a drug regimen review and establishing a drug utilization review system. The relationship of pharmacy to nursing home management, patients and personnel is also discussed. Prerequisite: P-4 standing.

431. HISTORY OF PHARMACY (3 + 0) 3 hours
The educational, organizational and professional growth and development of pharmacy in the United States.

441. INTRODUCTION TO RADIOACTIVE PHARMACEUTICALS (2 + 2) 3 hours
A survey course in the types of radiation, methods of detection and measurement and the application of radioisotopes to modern health care. Emphasis in the laboratory will be on safe storage, handling and control of radioactive material. Prerequisites: consent of instructor.

461. PHARMACY PRACTICE I (3 + 0) 3 hours
A study of the contemporary filling of physician orders. Topics include patient counseling, drug interactions, patient profile systems, and dispensing systems. Prerequisites: 311-323, 343.

462. PHARMACY PRACTICE II (3 + 0) 3 hours
A study of the appropriate use of nonprescription drugs, products and devices. Prerequisites: 312-361, and 311-373. Corequisite: 312-493.

463. PHARMACY PRACTICE LABORATORY (0 + 3) 1 hour
A laboratory course; practical experience in the compounding and dispensing of prescription orders. The emphasis is on accuracy and providing adequate patient counseling information. Prerequisite: 311-461.

464. STERILE PRODUCTS (2 + 0) 2 hours
The basic principles, equipment and techniques involved in the preparation, manipulation, and administration of parenteral products and other sterile dosage forms. Prerequisite: 311-323.

465. PRESCRIPTION PRODUCTS IN PRACTICE (1 + 0) 1 hour
A survey of the pertinent information concerning the most common prescription drugs. Corequisites: 312-493, 311-323, and 311-434.

471. SEMINAR IN IV THERAPY (2 + 0) 2 hours
The seminar discusses in detail various aspects of IV therapy. Topics may include complications of specific types of IV therapy, fluid therapy, and specific types of IV therapy. Prerequisite: 311-464.

472. SEMINAR IN CANCER (2 + 0) 2 hours
The seminar deals with cancer etiology and epidemiology. Students participate in the learning process by researching an area of their interest and presenting it to the class. Concepts discussed include "survival", physical and mental consequences of therapy, death and dying and the care of the terminally ill. Prerequisite: P-4 standing or permission of instructor.
473. THIRD PARTY REIMBURSEMENT SYSTEMS (3 + 0) 3 hours
The history, and development of the Third Party Programs now in existence including types of benefits, forms used, methods of payment, limitations, proposed methods of solving problems and surveillance and utilization review. Prerequisite: P-4 standing.

474. DOSAGE FORM DESIGN (2 + 0) 2 hours
The design and formulation of various dosage forms, with particular emphasis on the effect that the various formulation factors have on bioavailability of active ingredient. The dosage form is discussed and viewed as a drug delivery system. Prerequisite: 311-323.

475. PARENTERAL PRODUCTS SEMINAR (2 + 0) 2 hours
Various aspects of parenteral medication. This includes, but is not limited to, their characteristics, formulation, preparation, administration and biopharmaceutical behavior. Prerequisite: 311-323.

476. INFECTIOUS DISEASES (3 + 0) 3 hours
The pathophysiology and treatment of various infectious diseases. The problem solving approach is used in which the student is asked to present therapy for a disease when given a description of it. Prerequisites: 312-373, 312-421.

477. OUTPATIENT CLINICAL PHARMACY 1 hour
Students are required to present a paper about a pre-selected subject which is decided by the class. They are given several subjects to pick from before they select a topic. Prerequisite: Consent of instructor.

478. OUTPATIENT PHARMACY SERVICE (0 + 3) 1 hour
Laboratory course that serves the needs of the Health Center through the operation of the Model Pharmacy. Specific components include: the dispensing of prescriptions, patient counseling and patient profile maintenance. For student with limited or no internship experience. Prerequisite: Valid Ohio intern license; P-4 standing. Corequisite: 311-461.

510. COSMETIC SCIENCE (3 + 0) 3 hours
An overview of various types of cosmetics; how they are prepared and the rationale for their formulation. Prerequisite: consent of the instructor.

515. COSMETIC TECHNOLOGY (0 + 3) 1 hour
An optional laboratory for Cosmetic Science 510. A literature search on cosmetic formulation is required. The laboratory session will consist of compounding the cosmetic preparation that the student had previously investigated. Prerequisite: consent of instructor.

530. MANUFACTURING PHARMACY (1 + 6) 3 hours
The formulation and fabrication by mechanized methods of a variety of pharmaceutical dosage forms. Prerequisite: consent of instructor.

551. PHARMACEUTICAL LAW (4 + 0) 4 hours
A study of professional ethics and the philosophy, requirements, adminis-
tration, and enforcement of local, state and federal laws related to the practice of the profession of pharmacy. Prerequisites: 311-462, 463, and 464.

552. PHARMACEUTICAL MARKETING (3 + 0) 3 hours
Facts, considerations, and principles which underlie the flow of drug products, and the availability or use of pharmaceutical and other professional services from production to consumption. Principal economic, legislative, and social forces affecting the healthcare industry are discussed, and resulting policies and procedures are appraised.

553. PHARMACEUTICAL MANAGEMENT (4 + 0) 4 hours
Organization policies, planning and controlling, the relation of pharmaceutical services, professional practice and pharmacy operation to general business activity, patients and human service professions, and public health. Corequisite: 311-551.

560. CLINICAL PHARMACY I (3 + 6) 3 hours
Introduction to clinical pharmacy. Experience in area hospitals. Opportunity to see the application of principles discussed in other courses deal with such principles; the relationships among drugs, diseases and patients. Transportation is arranged by the student. Offered every quarter. Must be taken with 311-562 and 311-563. Prerequisites: 311-462, 463, 464, and 465; 312-492 and 493; P-5 standing.

561. CLINICAL CLERKSHIP (0 + 9) 3 hours
Experience in area hospitals, with a view to expanding the student’s knowledge of health care delivery and drug disease relationships. An in-depth experience in specific disease states. Prerequisites: 311-560 and permission of instructor.

562. THERAPEUTICS I (3 + 0) 3 hours
This course is designed to introduce the student to the process of therapeutic decision making. Taught on a problem-oriented record model and a variety of disease states are covered. Must be taken with 311-560 and 311-563. Prerequisites: 311-462, 463, 464, and 495; 312-492; P-5 standing.

563. INTRODUCTION TO DRUG INFORMATION (1 + 3) 2 hours
Special emphasis is placed on retrieval and evaluation of drug literature, dissemination and communication of a Drug Information Center. Must be taken with 311-562 and 560. Prerequisites: 311-462, 463, 464, and 465; 312-492, and 493; P-5 standing.

564. APPLIED PHARMACOKINETICS (3 + 0) 3 hours
The application of pharmacokinetics to institutional and community practice. Especially emphasized are drug concentrations in body fluid, laboratory data, disease states and drug interactions as related to dose regimen for therapeutic management of individual patients. Prerequisites: 311-323 and 343.
570. ADVANCED INSTITUTIONAL PHARMACY (2 + 0) 2 hours
A study of the organization and management of contemporary hospitals and the relationship of the pharmacy department to the hospital structure. Prerequisite: consent of instructor.

580. STRUCTURED EXTERNSHIP (0 + 45) 15 hours
A program of structured experiences in various health care centers. Provides the student with experience in the actual application of material learned in didactic subjects. Prerequisites: P-5 standing; 311-462, 463, 464, 465; 312-492 and 493; and valid Ohio Intern License.

590. SPECIAL TOPICS IN PHARMACY AND HEALTH CARE ADMINISTRATION 1-3 hours
Special topics in pharmacy and health care administration. Prerequisite: permission of instructor.

594. SEMINAR IN PHARMACY AND HEALTH CARE 1-3 hours
Seminar in pharmacy and health care administration. Prerequisite: permission of instructor.

597. INDEPENDENT STUDY IN PHARMACY AND HEALTH CARE ADMINISTRATION 1-3 hours
Prerequisites: permission of department chairman, 2.50 accumulative average.

DEPARTMENT OF PHARMACOLOGY AND BIOMEDICAL SCIENCES
(Department 312)

Professors Awad (On Leave 1981-82), Mallin, Stewart; Associate Professors Bhattacharya, Faulkner, Gossel (Chairman), L. Smith; Assistant Professors Bricker, Fung; Adjunct Professors Collins, Fulfs, Hiles.

301. SEMINAR IN PHARMACY COMMUNICATIONS (3 + 0) 3 hours
Basic elements of communication between health care personnel. Both didactic presentation and role-playing to gain experience in communication skills. Prerequisite: permission of the instructor.

302. MEDICAL TERMINOLOGY (3 + 0) 3 hours
An introductory course in medical terminology specifically and scientific terminology in general. Emphasis is placed on root words and affixes which have general and frequent occurrence in the communications of medicine, pharmacy, biology, chemistry and related areas.

341. BIOCHEMISTRY I (4 + 0) 4 hours
An introduction to the study of living organisms with emphasis on the human system. Topics include acid-base balance, buffers, biochemical energetics,
the chemistry of amino acids, proteins, enzymes and carbohydrates and the intermediary metabolism of carbohydrates. Prerequisite: Chemistry 233.

342. BIOCHEMISTRY II (4 + 0) 4 hours
A continuation of 312-341, including amino acid metabolism, the chemistry and metabolism of lipids, properties and biosynthesis of nucleic acids, protein biosynthesis, biochemical genetics and clinical biochemistry. The roles of vitamins in metabolism are emphasized throughout the biochemistry sequence. Prerequisite: 312-341

351. CLINICAL BIOCHEMISTRY (3 + 0) 3 hours
An introduction to the use of biochemical tests as agents for the diagnosis of human disease states. The theory, methodology, utility, significance, and reliability of such tests are discussed. Prerequisite: 312-342 or permission of instructor.

352. NUTRITION (3 + 0) 3 hours
An introduction to the principles of nutrition as they apply to the health practitioner. Topics covered include nutritional needs, evaluation of nutritional status, deficiency diseases, nutrition in various physiological and pathological states, diet therapy in disease, food fads and nutritional misinformation. Prerequisite: 312-341 or consent of instructor.

361. MICROBIOLOGY (4 + 0) 4 hours
An introductory course emphasizing fundamentals of general microbiology and a general survey of techniques and principles pertaining to bacteria, yeasts, molds, viruses, and rickettsia. The course includes a discussion of microbial pathogens and a detailed consideration of the host-parasite relationship. Prerequisite: one year of general biology or botany-zoology. Corequisite: 312-341.

362. MICROBIOLOGY (3 + 3) 4 hours
An introduction to the fundamentals of general and medical microbiology for students of medical technology. Pre or corequisite: one year of biological science.

371. MEDICINAL CHEMISTRY (5 + 0) 5 hours
A systematic interfacing of basic biological information with basic chemical information. The effects of the chemical on the biological system, and means by which the biological system manipulates and changes the chemical. The relationship between the chemistry of drugs and their biological action. Emphasis is placed on recognition of pharmacophoric groups, structure activity relationships, chemical properties, and nomenclature of drugs. Prerequisites: 122-233 and 312-341.

372. IMMUNOLOGY AND BIOLOGICALS (2 + 0) 2 hours
An introduction to basic immunology including the types of immune responses, nature of antigens and antibodies, and antigen-antibody interactions as a basis for understanding the biological products currently recommended for use in the United States. Emphasis is placed on those
biologicals used in the diagnosis, prevention and treatment of the most common infectious and immunologic diseases. Prerequisite: 312-342. Corequisite: 312-361.

373. PRINCIPLES OF DISEASE (3 + 0)  3 hours
An introduction to the pathological principles involved in human disease. The nature, etiology, progression and prognosis of specific diseases are studied from an organ or organ-system approach. Diseases involving the central nervous system, cardiovascular system and endocrine system are deferred to the pathology pharmacology sequence (312-492,493). Prerequisites: 121-332 and 312-341.

381. NATURAL PRODUCTS I (2 + 0)  2 hours
An introductory course which deals with a discussion of important examples of medicinal constituents found in terrestrial and marine plant origin. Besides the brief history and sources of selected major plant constituents, the chemical, biological properties and category of uses will be emphasized. Prerequisites: One year of biology and one year of organic chemistry.

382. NATURAL PRODUCTS II (2 + 0)  2 hours
A continuation of Natural Products I dealing specifically with a discussion of natural products found in both terrestrial and marine animals. Emphasis is on biomedicinals such as hormones, enzymes and on the biotoxins in these animals. Prerequisite: 312-381.

421. CHEMOTHERAPY OF INFECTIOUS DISEASE (4 + 0)  4 hours
A study of the antibiotics and synthetic chemicals used in the prophylaxis and treatment of infectious diseases of a drug oriented approach for selected diseases. Subjects include selective toxicity; dosage forms, choices in therapy; differential diagnosis; MIC; resistance; penicillins, cephalosporins, tetracyclines, and other antibiotics; therapy of urinary tract infections; therapy of acid-fast infections; parasitic disease treatment. Prerequisites: 312-361 and 121-333.

441. MEDICINAL PLANT PROPAGATION AND CULTIVATION (2 + 3)  3 hours
An introduction to the economic, geographical, commercial, and biological aspects of plants as sources of drugs, spices and various natural chemical products. Common poisonous plants and potentially harmful toxic constituents of plant foodstuffs are discussed. Field trips and cultivation of medicinal plants. Students are required to research the literature, to write and to present reports. Prerequisite: consent of instructor.

442. MEDICINAL PLANTS (3 + 0)  3 hours
A consideration of the economic, geographical, commercial and biological aspects of medicinal plants as a source of drugs, spices, herbal and folklore remedies. Common poisonous plants, drug abuse plants and potentially harmful toxic constituents of foodstuff plants are emphasized. Prerequisite: consent of instructor.
462. VIROLOGY (2 + 0)  2 hours
A comprehensive coverage of the virus-host relationship from the viewpoint of molecular biology. Model systems will be discussed utilizing the bacteriophage. Prerequisites: 312-342, 361, and consent of instructor.

491. INTRODUCTORY AND AUTONOMIC PHARMACOLOGY (4 + 0)  4 hours
The principles of pharmacology and a study of drugs which affect the autonomic nervous system; autacoids; antineoplastic agents; and several miscellaneous drug classes. The pharmacodynamic and pharmacokinetic properties of the drugs are related to therapeutic and toxicological aspects of drug therapy. Prerequisites: 121-333, 312-342, 311-343; P-4 standing. Corequisite: 312-373.

492. PATHOLOGY AND PHARMACOLOGY OF THE CENTRAL NERVOUS SYSTEM (4 + 0)  4 hours
A study of diseases of the central nervous system and the pharmacology of the drugs used to treat these disorders. The pharmacodynamic and pharmacokinetic properties of the drugs are related to the therapeutic and toxicological aspects of the treatment of the diseases. Prerequisites: 312-491, 312-373, and P-4 standing.

493. PATHOLOGY AND PHARMACOLOGY OF THE CARDIOVASCULAR AND ENDOCRINE SYSTEMS (5 + 0)  5 hours
A study of diseases of the cardiovascular, renal, and endocrine systems and the drugs used to treat these disorders. The pharmacodynamic and pharmacokinetic properties of these drugs are related to the therapeutic and toxicological aspects of the treatment of the diseases. Prerequisites: 312-491, 373; P-4 standing.

494. LABORATORY IN THE BIOMEDICAL SCIENCES I (0 + 1)  1 hour
Demonstration and student-participation laboratories using chemical and biological methodology. Basic laboratory experiments in pharmacology, biochemistry, medicinal chemistry, clinical chemistry, toxicology, microbiology, and pharmacokinetics are included and an interdisciplinary approach is used in many of the experiments. Prerequisites: 312-342, P-4 standing. Corequisites: 312-361, 491, and 373.

495. LABORATORY IN THE BIOMEDICAL SCIENCES II (0 + 1)  1 hour
Prerequisites: 312-491, 312-494, and P-4 standing. Corequisite: 312-492.

496. LABORATORY IN THE BIOMEDICAL SCIENCES III (0 + 1)  1 hour
Prerequisites: 312-491, 312-495, and P-4 standing. Corequisite: 312-493.
502. PRINCIPLES AND PRACTICE OF PUBLIC HEALTH (3 + 0) 3 hours
Individual and community aspects of public hygiene, including infections, epidemiology, prophylaxis, and discussion of the major illnesses (nutritional, mental, environmental and occupational). Prerequisite: 312-361.

511. VETERINARY PHARMACY (2 + 0) 2 hours
The various pathological conditions peculiar to animals, and the pharmaceuticals used in the treatment thereof. Prerequisite: consent of instructor. (Formerly 311-511).

521. TOXICOLOGY (3 + 0) 3 hours
An introduction to the essential subject matter of clinical toxicology. Lectures, assigned readings in texts and current literature, and selected audiovisual materials. Topics include classification and mechanisms of drug and chemical toxicity; environmental and household poisoning; emergency management of poisoning. Major emphasis will be on areas of medical importance. Prerequisites: 312-492 and 493; or permission of instructor. P-5 standing.

571. SEMINAR IN PSYCHOPHARMACOLOGY (2 + 0) 2 hours
Student presentation of papers and discussion of current events and relevant topics in clinical, industrial, occupational, and environmental toxicology. Prerequisite: P-5 standing.

572. SEMINAR IN TOXICOLOGY (2 + 0) 2 hours
A seminar course involving student presentation of papers and discussion of topics. Current events and relevant topics in clinical, industrial, occupational, and environmental toxicology are discussed. Prerequisite: P-5 standing.

573. SEMINAR IN PEDIATRIC PHARMACOLOGY (2 + 0) 2 hours
An overview of common pediatric medical disorders and their management with special reference to the pharmacological basis of pediatric medicine. Prerequisite: 312-493.

574. SEMINAR IN GERIATRIC PHARMACOLOGY (2 + 0) 2 hours
An overview of major geriatric medical disorders and their management with special reference to the pharmacological basis of geriatric medicine. Prerequisite: 312-493.

575. SEMINAR IN PROBLEMS OF DRUG ABUSE (2 + 0) 2 hours
An overview of the adverse effects of illicit drugs, particularly the longterm consequences of drug abuse. The problems of drug abuse from pharmacological and biomedical aspects are discussed. Prerequisite: 312-493.

590. SPECIAL TOPICS IN PHARMACOLOGY AND BIOMEDICAL SCIENCE 1-3 hours
Prerequisite: permission of instructor.
594. SEMINAR IN PHARMACOLOGY AND BIOMEDICAL SCIENCE
Prerequisite: permission of instructor.

597. I/S IN PHARMACOLOGY AND BIOMEDICAL SCIENCE
Prerequisite: permission of department chairman; accumulative grade point average of 2.50.