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The Wilfred E. Binkley Chair of History and Political Science, inaugurated in 1971, has been made possible by a grant from the Scaife Foundation of Pittsburgh. The 1999-2000 recipient is Dr. Ellen S. Wilson.

The Irene Casteel Chair in Education, Professional and Social Sciences, was established in 1992 and funded by a bequest from Irene Casteel in 1998. The 1999-2000 recipient is Dr. Michael Romanowski.

The Mary Reichelderfer Chair in Mathematics and Computer Science was established in 1983 with funds from the estate of Mary K. Werkman. Dr. Danhong Song is the 1999-2000 recipient.

The Sara A. Ridenour Chair of Humanities was established in 1983 from funds provided by her daughter. The recipient for 1999-2000 is Dr. Roseanna L. Dufault.

The Kernan Robson Chair of Government, inaugurated in 1972, has been made possible by a trust established by the late Kernan Robson. The 1999-2000 recipient is Dr. JoAnn M. Scott.

Mission Statement

The Getty College of Arts and Sciences is a community of students and faculty committed to academic, moral, and spiritual development. The rich diversity of studies available in the college challenges community members to develop personal goals and to discover means of achieving them.

The educational program of the college provides a coherent framework that equips each student to flourish in a world of rapidly changing conditions. Academic growth will be demonstrated through achieving special proficiency in the student's major field or fields of study. Specific cognitive goals include knowledge of the origins and content of contemporary culture, effective communication based on logical thinking, competence in quantitative reasoning, a rational approach to the physical and biological world, and sensitivity to artistic expression. This foundation for lifelong learning is designed to equip students to function as free persons in a free society and to support personal commitment to ethical and religious ideals that are vital for humanity.

The effectiveness of student learning is demonstrated through an assessment plan which measures progress in the specific cognitive goals between first year entry into the college and the third year of enrollment.
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. Twelve of these units are as follows: 4 units in English; 2 units in mathematics; 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 American College Test or the College Entrance Examination Board tests are expected of all candidates.

The First Year Experience

The College of Arts and Sciences has established a “First Year Experience” program which particularly meets the needs of new students at Ohio Northern University. This First Year Experience program includes the Freshman Seminar course, department orientation courses, and pre-professional orientation courses. Although the specific selection of courses within this group is a function of the student's interests, major field, and career aspirations, each student will meet the general goals of the overall program through a set of common experiences. The general goals of the First Year Experience program are as follows:

1. It is designed to help new students make the transition from high school to college life. In particular, it attempts to integrate new students into the Ohio Northern University campus community.

2. It helps acquaint new students with the facilities, operations, and procedures of the University. Specific attention is given to those matters that directly impact the student's major program and/or career path.

3. It encourages new students to take full advantage of the many opportunities for growth available to them at Ohio Northern University, including participation in cultural, social, and intellectual activities designed to provide for their adjustment to the campus and to enrich their college experience.

The Senior Capstone Experience

All students graduating from the College of Arts and Sciences participate in a “Senior Capstone Experience” which allows them to integrate many concepts from their major course of study into a final project or activity. The exact nature of the capstone experience is dependent upon the specific departmental major, and the requirement may be fulfilled by a variety of senior-level events such as seminars, research projects/papers, recitals, exhibitions, or practicums.

Degree Requirements

An approved Honors Seminar may fulfill a requirement listed below for any degree offered by the College of Arts and Sciences.

Bachelor of Arts

The following are the prescribed general education courses required of all students enrolled in a Bachelor of Arts degree program. This degree is available to students in most of the majors within the College of Arts and Sciences (see “Completing a Major” on page 52). Specific requirements for the Bachelor of Music are listed under the department of music.

Basic Requirements

First Year Experience—Orientation or Freshman Seminar
English 110 and 111
English 204 (Great Works)
Public Speaking 211 or Interpersonal Communication 225
Western Civilization 110 and 111
Philosophy—one four-credit course (see department listing for appropriate courses)
Religion—one four-credit course (see department listing for appropriate courses)
Foreign language—first-year competency (three courses in one modern spoken language). This requirement may be waived for students whose native language is other than English.

Distributional Requirements

a. Fine Arts
two courses (or equivalent totaling eight credit hours) in at least two disciplines: art, music, theatre. One of these must be a classroom course, but six hours of a single, continuing activity course from the following list may fulfill the second four hour course requirement. The maximum number of activity hours allowed to count toward graduation, whether fulfilling the fine arts requirement or free elective credit, is twelve.
Bachelor of Science

The following are the prescribed general education courses required of all students enrolled in a Bachelor of Science degree program. A candidate for the Bachelor of Science degree may major in biology, environmental studies, molecular biology, chemistry, biochemistry, medicinal chemistry, physics, mathematics, mathematics/statistics, computer science, health, physical education and sport studies, or technology. Specific requirements for the B.S. in Medical Technology are listed under the department of biological sciences.

Basic Requirements
First Year Experience—Orientation or Freshman Seminar
English 110 and 111
English 204 (Great Works)
Public Speaking 211 or Interpersonal Communication 225
Western Civilization 110 and 111
Philosophy—one four-credit course (see department listing for appropriate courses)
Religion—one four-credit course (see department listing for appropriate courses)
Mathematics—three courses (12 credits) at the level of College Algebra (120) or above

Distributional Requirements
Science component—four courses (16 credits outside the major program of study) from the biological or physical sciences.
Two courses (8 credits) in social sciences selected from economics, geography, political science, psychology, sociology.
One course (4 credits) in fine arts - A total of 6 approved activity hours will meet this requirement. (See list and policy under B.A. degree.)

Graduation Requirements
Although there is no college computer literacy requirement, each student will experience the use of the computer or substantial exposure to or study of the uses and implications of computer technology as determined by the specific program major.

The following are specific requirements in the student’s total educational program:

a. at least four credits which involve substantial exposure to or study of a non-Western people, society, or culture;

b. at least three 1-hour physical education activity courses with 6 hours maximum counted toward the degree, except for physical education majors (see course distribution requirement under Physical Education Service Courses on page 51);

c. satisfactory participation in the third-year assessment program;

d. completion of all major requirements, including the senior capstone experience, as stipulated by the appropriate program faculty.

Students seeking teacher licensure must take at least one computer science course and one mathematics course.

Graduation Requirements
Although there is no college computer literacy requirement, each student will experience the use of the computer or substantial exposure to or study of the uses and implications of computer technology as determined by the specific program major.

The following are specific requirements in the student’s total educational program:

a. at least four credits which involve substantial exposure to or study of a non-Western people, society, or culture;

b. at least three 1-hour physical education activity courses with 6 hours maximum counted toward the degree, except for physical education majors (see course distribution requirement under Physical Education Service Courses on page 51);

c. satisfactory participation in the third-year assessment program;

d. completion of all major requirements, including the senior capstone experience, as stipulated by the appropriate program faculty.
Bachelor of Fine Arts

The following are the prescribed general education courses required of all students enrolled in a Bachelor of Fine Arts degree program. This degree is available to students majoring in art or communication arts and is applicable to concentrations in graphic design, studio arts and musical theatre. All teacher licensure students seeking the Bachelor of Fine Arts degree must take at least one four-hour computer science course and one four-hour mathematics course.

Basic Requirements

First Year Experience–Orientation or Freshman Seminar

English 110 and 111

English 204 (Great Works)

Public Speaking 211 or Interpersonal Communication 225

Western Civilization 110 and 111

Philosophy—one four-credit course (see department listing for appropriate courses)

Religion— one four-credit course (see department listing for appropriate courses)

Foreign Language—competency in the first two courses in one modern, spoken language

Distributional Requirements

a. Fine Arts
two courses (or equivalent totaling eight credit hours) not applicable to the major in at least two disciplines: art, music, theatre. A total of six approved activity hours will satisfy the requirement for one of the two courses. (See list and policy under B.A. degree.)

b. Social Sciences
one course (4 credits) selected from economics, geography, political science, psychology, sociology

c. Mathematics/Natural Sciences
two courses (8 credits) in two areas selected from biological science, physical science, mathematics

Graduation Requirements

Although there is no college computer literacy requirement, each student will experience the use of the computer or substantial exposure to or study of the uses and implications of computer technology as determined by the specific program major.

The following are specific requirements in the student’s total educational program:

a. at least four credits which involve substantial exposure to or study of a non-Western people, society, or culture;

b. at least three 1-hour physical education activity courses with 6 hours maximum counted toward the degree, except for physical education majors (see course distribution requirement under Physical Education Service Courses);

c. satisfactory participation in the third-year assessment program;

d. completion of all major requirements, including the senior capstone experience, as stipulated by the appropriate program faculty.

Graduation Requirements: Non-Western Culture Courses

The following courses will meet the general education graduation requirement in non-Western culture study. Some courses may have prerequisites.

COMM 291 World Theatre History
ENGL 219 Non-Western Literature
ENGL 262 African Literature
ENGL 432 Studies in Comparative Literature
FREN 329 Civilisation Francaise: Les Cultures Francophones
FREN 418 Francophone Literature of the Twentieth Century
GEOG 226 World Regional Geography
HIST 415 Russian History To 1815
HIST 471 History of the Ottoman Empire
HSPS 222 Contemporary Asia
HSPS 223 Contemporary Africa
HSPS 224 Contemporary Middle East
HSPS 225 Contemporary Latin America
MUSC 200 Non-Western Music
PLSC 107 International Studies and World Problems
PLSC 336 Developing Political Systems
RELG 231 Religious Experience
RELG 241 Islam and Christianity
RELG 243 The Bible and the Third World
RELG 264 Buddhism
SOC 250 Cultural Anthropology
SPAN 351 Hispanic Cultural Perspectives
SPAN 354 Latin American Civilization
SPAN 357 Latin American Art, Music, and Dance

Additional courses fulfilling this requirement may be approved and will be so announced.

Physical Education Service Courses (All Degrees)

Students will be required to take three physical education courses with one course from the fitness area, one course from the lifetime activities area, and one course from the wellness area. See the department of health, physical education and sport studies for definition of the areas. A student is not restricted to the required three credit hours of physical education. A student can receive, in addition to the three required physical education credits, three additional physical education credits that may be applied toward graduation by participation in intercollegiate athletics or by taking other courses within the physical education service program. A maximum of six physical education hours may be counted toward graduation.

In order to receive physical education credit for participation in intercollegiate athletics, a student/athlete must complete the entire season in
good standing. An unsatisfactory grade will be assigned if a student/athlete: a) quits the team, b) is dismissed from the team, or c) participates in less than 50 percent of the season. Participation in intercollegiate athletics constitutes one hour of physical education credit per sport to a maximum of three sports. Only one credit of intercollegiate participation in each sport may be counted toward graduation.

 Completing a Major

The degree candidate is required to complete in a logical sequence a major of not less than 44 quarter hours. Students may be listed as majoring in general studies during their freshman and sophomore years, but they must select a distinct major with an appropriate degree by the start of their junior year of study. Students who have a particular interest in science may be listed as majoring in general science to insure a appropriate course selection in preparation for an eventual major in one of the basic or professional science programs. General science students should select a distinct major with an appropriate degree by the start of their 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 Center for Teacher Education for a professional advisor. In some majors, areas of concentration requiring at least 21 quarter hours are provided allowing the student to focus on a specific area within a major.

Students pursuing a 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.

The following major fields are offered for the bachelor’s degree in the College of Arts and Sciences:

<table>
<thead>
<tr>
<th>Major, Concentration</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art</td>
<td>BA, BFA</td>
</tr>
<tr>
<td>Graphic Design</td>
<td>BFA</td>
</tr>
<tr>
<td>Studio Arts</td>
<td>BFA</td>
</tr>
<tr>
<td>Athletic Training</td>
<td>BA, BS</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>BS</td>
</tr>
<tr>
<td>Biology</td>
<td>BA, BS</td>
</tr>
<tr>
<td>Chemistry</td>
<td>BA, BS</td>
</tr>
<tr>
<td>Communication Arts</td>
<td>BA</td>
</tr>
<tr>
<td>Broadcasting and Electronic Media</td>
<td>BA</td>
</tr>
<tr>
<td>Musical Theatre</td>
<td>BFA</td>
</tr>
<tr>
<td>Professional and Organizational Communication</td>
<td>BA</td>
</tr>
<tr>
<td>Public Relations</td>
<td>BA</td>
</tr>
<tr>
<td>Theatre</td>
<td>BA</td>
</tr>
<tr>
<td>Computer Science</td>
<td>BA, BS</td>
</tr>
<tr>
<td>Criminal Justice</td>
<td>BA</td>
</tr>
<tr>
<td>Education-Early Childhood</td>
<td>BA</td>
</tr>
<tr>
<td>Education-Middle Childhood</td>
<td>BA</td>
</tr>
<tr>
<td>English/Creative Writing</td>
<td>BA</td>
</tr>
<tr>
<td>English/Language Arts</td>
<td>BA</td>
</tr>
<tr>
<td>English/Literature</td>
<td>BA</td>
</tr>
<tr>
<td>English/Professional Writing</td>
<td>BA</td>
</tr>
<tr>
<td>Environmental Studies</td>
<td>BS</td>
</tr>
<tr>
<td>French</td>
<td>BA</td>
</tr>
<tr>
<td>Health Education</td>
<td>BA, BS</td>
</tr>
<tr>
<td>History</td>
<td>BA</td>
</tr>
<tr>
<td>International Studies</td>
<td>BA</td>
</tr>
<tr>
<td>Journalism</td>
<td>BA</td>
</tr>
<tr>
<td>Mathematics</td>
<td>BA, BS</td>
</tr>
<tr>
<td>Mathematics/Statistics</td>
<td>BA, BS</td>
</tr>
<tr>
<td>Medical Technology</td>
<td>BSMT</td>
</tr>
<tr>
<td>Medicinal Chemistry</td>
<td>BS</td>
</tr>
<tr>
<td>Molecular Biology</td>
<td>BS</td>
</tr>
<tr>
<td>Music</td>
<td>BA</td>
</tr>
<tr>
<td>Music Composition</td>
<td>BM</td>
</tr>
<tr>
<td>Music Education</td>
<td>BM</td>
</tr>
<tr>
<td>Music Performance</td>
<td>BM</td>
</tr>
<tr>
<td>Music with Elective Studies</td>
<td>BM</td>
</tr>
<tr>
<td>In Business</td>
<td>BM</td>
</tr>
<tr>
<td>Philosophy</td>
<td>BA</td>
</tr>
<tr>
<td>Philosophy and Religion</td>
<td>BA</td>
</tr>
<tr>
<td>Physical Education</td>
<td>BA, BS</td>
</tr>
<tr>
<td>Physics</td>
<td>BA, BS</td>
</tr>
<tr>
<td>Political Science</td>
<td>BA</td>
</tr>
<tr>
<td>Psychology</td>
<td>BA</td>
</tr>
<tr>
<td>Religion</td>
<td>BA</td>
</tr>
<tr>
<td>Social Studies</td>
<td>BA</td>
</tr>
<tr>
<td>Sociology</td>
<td>BA</td>
</tr>
<tr>
<td>Spanish</td>
<td>BA</td>
</tr>
<tr>
<td>Sport Management</td>
<td>BA, BS</td>
</tr>
<tr>
<td>Technology</td>
<td>BA, BS</td>
</tr>
<tr>
<td>Wellness</td>
<td>BA, BS</td>
</tr>
</tbody>
</table>

The Bachelor of Music and Bachelor of Science in Medical Technology Degree Programs

A candidate for the Bachelor of Music degree may major in music composition, education, music with elective studies in business or performance (see p. 140). A candidate for the Bachelor of Science in Medical Technology degree must complete the clinical year as well as other prescribed requirements (see p. 66). All teacher license students seeking the Bachelor of Music degree must take at least one four hour computer science course and one four hour mathematics course.

Minors A formal program of academic minors is available in several of the subject matter areas. Consult the chair of the department in question for specific procedural instructions. Minors require a minimum of 28 quarter hours of approved courses, including some work above the 200 level. Minors are for students who wish to pursue organized study in a discipline without completing a major.
Options
A specific program of academic options is available in conjunction with several of the majors in the college. Included are options in advanced manufacturing, church vocations, criminal justice, computational physics, design analysis, forensic science, and graphic communications. The courses involved are listed under the department of the primary major. Business-related options are also available to all students in the College of Arts and Sciences. They are as follows:

Accounting Option
ACCT 211  Principles of Accounting 1  4 hrs
ACCT 212  Principles of Accounting 2  4 hrs
One of the following sequences:  8 hrs
ACCT 301/302  Intermediate Accounting 1 & 2
ACCT 314/315  Intermediate Managerial Accounting 1 & 2
Three additional 300/400 level business courses approved by the department of the student's major, at least two of which are accounting courses.  12 hrs
28 hrs

Business Option
ACCT 211  Principles of Accounting 1  4 hrs
ACCT 212  Principles of Accounting 2  4 hrs
ABUS 312  Business Law 1  4 hrs
One of the following courses:  4 hrs
MGMT 333  Management and Organizational Behavior
MRKT 351  Principles of Marketing
FINC 362  Managerial Finance
Three additional 300/400 level business courses approved by the department of the student's major.  12 hrs
28 hrs

Economics Option
IBEC 202  Prin. of Microeconomics  4 hrs
IBEC 203  Prin. of Macroeconomics  4 hrs
IBEC 383  Intermed. Microecon. Theory  4 hrs
IBEC 384  Intermed. Macroecon. Theory  4 hrs
Three additional 300/400 level business courses approved by the department of the student's major, at least two of which are economics courses  12 hrs
28 hrs

An option requires a minimum of 28 quarter hours in coursework related to a specified department or discipline, but its original conception and continued integrity as a dynamic program may come from a source external to that department or discipline. Students should consult the chair of their major department for specific procedural instructions on all options.

Dual Degree Programs
Information concerning dual degree programs involving the College of Arts and Sciences appears on page 33 of this catalog. Students may receive further details in the office of the dean of the college.

Teacher Education
Ohio Northern University is vitally concerned with preparing effective and efficient teachers. Programs are offered within the degree requirements in almost every department.

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. To be accepted, the student must have an overall accumulative point average of at least 2.50 with no grade less than "C." The Center for Teacher Education establishes policies for admission into the program of teacher education and considers all application for admission to the program.

The Center is nationally accredited by the National Council for the Accreditation of Teacher Education (NCATE).

Students preparing to teach are assigned advisors in the Center for Teacher Education to assist them with the scheduling of professional education courses and the completion of clinical/field experiences. The advisor in the student's major department continues to advise the student on the requirements for his/her major.

Students entering teacher education prior to September 1998 will seek certification in areas listed on pages 91-94. Freshmen starting September 1998 and after will work toward licensure areas listed on pages 91-94.

Students with degrees from other accredited universities must complete all requirements to be admitted to the teacher education program and the required professional education courses in the Center for Teacher Education.

Preprofessional Programs
Medical Sciences Programs
A Medical Sciences Advisory Committee has been established for the purpose of advising students in the areas of the medical sciences (premedicine, predentistry, preveterinary medicine, etc.). 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 new premedical students at summer orientations. Committee members serve as academic advisors and are available to provide guidance and information to help students pursue their professional goals during their undergraduate careers.
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 specific requirements of the professional program being pursued. For further information, contact Dr. Rodney P. Anderson, chair, Medical Sciences Advisory Committee.

**Medical Technology** Many 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. in Medical Technology degree. Recently, a more popular option for medical technology students has been to spend four years on campus and a fifth year at an accredited medical technology school. This allows students to earn a B.S. in Biology, a B.S. in Medical Technology and a chemistry minor. This additional education has made our students strong candidates for medical technology and laboratory administration positions. Ohio Northern University is affiliated with Riverside Mercy Hospital in Toledo, the Cooperative Medical Technology Program of Akron and St. Vincent's Health Center in Erie, PA. For additional information, see Department of Biological Sciences program descriptions in this catalog. For detailed curriculum information contact Dr. Linda Young, Medical Technology Coordinator, Department of Biological Sciences.

**Prephysical Therapy** The prephysical therapy curriculum most appropriately prepares students for entry into post-baccalaureate Master's Degree programs in physical therapy. In general, required courses include one year of biology, one year of general chemistry, one year of physics and mathematics courses most appropriately at the level of pre-calculus. Courses in psychology are required in addition to various recommended electives considered necessary for application to graduate programs.

**Preoccupational Therapy** The preoccupational therapy program prepares students for entry into post-baccalaureate Master's Programs in occupational therapy that typically require prerequisite coursework concentrating on the following areas: biological sciences (biology, physiology, and human anatomy each with a laboratory component), behavioral sciences, written/verbal communication, physics, chemistry, biostatistics, medical terminology, and computer literacy.

Both curricula also include completion of a one quarter internship in a physical therapy/occupational therapy clinical setting. Because admission requirements, prerequisites, and program components differ from school to school, details of either curriculum may vary dependent on the chosen graduate program. For further information, contact Dr. Rema G. Suniga, Prephysical Therapy/Preoccupational Therapy Coordinator, Department of Biological Sciences.

**Pre-Physician Assistant** The pre-physician assistant program will prepare the student for entry into most master level physician assistant programs. The basic program, offered by the department of biological sciences, includes one year of biology, one year of general chemistry, and one year of mathematics emphasizing biostatistics. Course requirements in biochemistry and organic chemistry will vary according to individual program requirements. Additional courses taken in the biological sciences department include: physiology, human anatomy, developmental anatomy, basic emergency response, genetics, microbiology, immunology, as well as other biology course and cognates required to fulfill the requirements for a Bachelor of Science degree in Biology. The curriculum also includes courses in nutrition, philosophy, and psychology. For further information, contact Dr. Amy Aulthouse, Pre-Physician Assistant Coordinator, Department of Biological Sciences.

**Preseminary** A faculty member in the department of philosophy and religion serves as advisor to the preseminary student in planning a preprofessional program. The recommendations of the American Association of Theological Schools are followed in counseling the student. A major in the department of philosophy and religion or in another appropriate department may be selected.

**Prelaw** Students in the prelaw program select a major and complete the necessary requirements as do other students. The program is open to all students enrolled in any academic department of the Colleges of Arts and Sciences, Engineering, Pharmacy, or Business Administration. For additional information, see page 33.

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**General Regulations**

1. A student usually may not register for more than 19 hours of academic work unless he/she 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. See page 18 for overload charges beyond 19 credit 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 orientation or freshman seminar in the fall quarter.

3. A student indicates a choice of major field by filling out a declaration of major form available in the office of the department chair or dean.

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

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

6. With the permission of the instructor and the department chair, any course prerequisite may be waived.
7. Except where noted, credit hours earned in repeated courses may be counted only one time among the total hours required for graduation.
8. Writing 1 should be taken by all freshmen during their first quarter on campus. Both courses in writing should be completed by the end of the freshman year.
9. In all degree programs, a given course may not count for both basic and distributional requirements.

S/U Grade Option

Students in the College of Arts and Sciences are given the opportunity to register for one course per quarter on a S/U (Satisfactory/Unsatisfactory) options basis, with the following stipulations:
1. The student must have sophomore, junior, senior or postgrad standing.
2. The requested course cannot count toward fulfillment of major, minor, concentration, or option requirements.
3. The requested course cannot be a 100-level general education course.
4. The requested course cannot be a cognate.
5. The grade of “S” is to be equated with A, B, C. The grade of “U” is equated with D or F.
6. Students cannot change their minds about the grading system after the second week of class.

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; for senior standing, 135 quarter hours.

Academic Standing

A grade point average of 2.00 is required for graduation. If a student’s accumulative grade point average falls below 2.00, the student is placed on academic probation. The student can return to good academic standing by raising his/her accumulative grade point average to 2.00 or above.

If the accumulative grade point average of a freshman falls below 1.60, that student cannot participate in competitive activities of individuals, teams, or other groups officially designated as representing the University. A sophomore must maintain at least a 1.80 accumulative grade point average to participate in the aforementioned activities. Juniors and seniors who are on academic probation are not eligible to participate in these activities.

Any student on probation whose quarter grade point average for the following quarter is below a 2.00 will have his/her record reviewed by the Committee on Academic Qualifications of the college and may be recommended to the dean for academic actions which may include suspension or dismissal.

If action is taken to suspend a student, the suspension will be for a definite period of time, after which the student may apply for readmission. If readmission is granted, the Committee on Academic Qualifications may establish certain conditions of academic performance for the student to remain enrolled in the College of Arts and Sciences. Continued poor performance by a readmitted student will lead to dismissal.

If action is taken to dismiss a student, it is to be regarded as a terminal action and the student is not eligible to apply for readmission to the College of Arts and Sciences at any time thereafter.

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 appropriate general education courses, complete an approved major, and have an accumulative point average of at least 2.00.

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.

To graduate with a Bachelor of Science in Medical Technology the student must complete the three-year preclinical program of 138 quarter hours and a one-year clinical program in an approved program of 45 quarter hours for a total of 183 quarter hours.

To graduate with a Bachelor of Music degree in music education, performance, composition, or music with elective studies in business, the student is required to complete a minimum of 182 quarter hours which includes the appropriate general education courses, complete an approved major, and have an accumulative point average of 2.00. The music education major must also complete all course work and observation hours required by the state of Ohio for teacher licensure.
001 - MEDICAL SCIENCES ORIENTATION
1.00 Credit
Provides familiarity with general requirements and admissions standards for entry into colleges of medicine, dentistry, veterinary medicine, etc. Open to students interested in preparing for a career in these areas. CREDIT EARNED IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY. Graded S/U.

002 - PRELAW ORIENTATION
1.00 Credit
Provides familiarity with general requirements and admissions standards for entry into law school and with opportunities in the legal profession. CREDIT EARNED IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY. Graded S/U.

003 - GENERAL SCIENCE ORIENTATION
1.00 Credit
Examination of science-based majors and/or programs available at Ohio Northern University. Information to assist in making career choices. CREDIT EARNED IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY. Graded S/U.

010 - STUDY SKILLS
1.00 Credit
To increase study efficiency by emphasizing improvement in motivation, concentration and memory. Attention is also given to selected study skills including time-management, listening, note taking, reading comprehension and testing. In addition to the weekly class meeting, this course includes one weekly study-skills lab. CREDIT EARNED IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY. Open to freshmen and sophomores only.

011 - COLLEGE READING SKILLS
2.00 Credits
To increase student reading efficiency of college textbooks by emphasizing improvement in student reading comprehension, reading speed and vocabulary. In addition to the weekly class meeting, this course includes two weekly reading labs. CREDIT EARNED IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY.

012 - STRESS MANAGEMENT AND EFFECTIVE LIVING
1.00 Credit
To provide students an opportunity to learn and adopt stress management skills that will enable them to lead more productive and satisfying lives. In addition to the weekly class meeting, this course includes one weekly individualized stress-management lab. CREDIT EARNED IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY.

100 - FRESHMAN SEMINAR
1.00 Credit
To acclimate freshmen to academic, personal, social and cultural opportunities at the university. To encourage positive life-long learning skills for students. To help them cope successfully with the demands of the first year of college through the use of challenges and opportunities in and out of the classroom. Graded S/U.

121 - CAREER EXPLORATION THROUGH PERSONAL ANALYSIS
1.00 Credit
Principles, methods and practice in career development with emphasis on self analysis, career information, exploration of careers and career opportunities. In addition to the weekly class meeting, this course includes one weekly individualized career development lab. This course is designed for freshmen and sophomores who are uncertain about their college major or their career plans.

190 - SPECIAL TOPICS
1.00 to 4.00 Credits
Can be repeated as the topic varies. May be graded S/U as appropriate to the topic.

290 - SPECIAL TOPICS
1.00 to 4.00 Credits
Can be repeated as the topic varies. May be graded S/U as appropriate to the topic.
297 - INDEPENDENT STUDY
1.00 to 4.00 Credits
Can be repeated as the topic varies.

300 - JOB AND GRADUATE SCHOOL SEARCH TECHNIQUES
1.00 Credit
An experiential course where students will learn skills that will enable them to develop and implement personalized and successful career search strategies. CREDIT EARNED IN THE COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY. Open to juniors/P4's and seniors/P5's only. Course graded S/U. Can be repeated once.

390 - SPECIAL TOPICS
1.00 to 4.00 Credits
Can be repeated as the topic varies. May be graded S/U as appropriate to the topic.

490 - SPECIAL TOPICS
1.00 to 4.00 Credits
Can be repeated as the topic varies. May be graded S/U as appropriate to the topic.

497 - INDEPENDENT STUDY
1.00 to 4.00 Credits
Can be repeated as the topic varies.

DEPARTMENT OF AEROSPACE STUDIES

Subject - Aerospace Studies (AERO)

A TOTAL OF SIX CREDITS EARNED IN AIR FORCE ROTC MAY COUNT TOWARD THE 182 QUARTER HOURS NEEDED FOR GRADUATION IN THE COLLEGE OF ARTS AND SCIENCES

111 - AIR FORCE ORGANIZATION 1
3.00 Credits
Organization of the United States Air Force. Focus on missions involving airlift forces, strategic forces, tactical forces as well as overseas forces. The development and employment of weapons systems and logistic support functions are also discussed. Leadership Laboratory activities.

112 - AIR FORCE ORGANIZATION 2
3.00 Credits
Organization of the United States Air Force. Focus on U.S. Defense Policies, military balance between U.S. and world forces as well as capabilities of Army, Navy and Reserve/Guard forces. Officership/Professionalism and Introduction to Flight are discussed. Laboratory Leadership activities.

211 - AIR FORCE HISTORY 1
3.00 Credits
Development of air power from the first lighter-than-air vehicles through to the establishment of the Department of the Air Force as an independent military force. 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.

212 - AIR FORCE HISTORY 2
3.00 Credits
Development of air power since the establishment of the independent Air Force to the 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.
311 - AIR FORCE MANAGEMENT 1
5.00 Credits
Integrated management course emphasizing individual as leader in the Air Force. Human behavior, individual and in groups, historical development of management thought, discussion of classical leadership theory, oral and written communication, military writing, and briefing formats. Leadership laboratory activities. Prerequisite: Departmental approval.

312 - AIR FORCE MANAGEMENT 2
5.00 Credits
Continuation of 311. Air Force leadership, planning, organizing, coordinating, directing and controlling functions of management with emphasis on Air Force application, concept of command and staff, junior officer as administrative leader, Air Force personnel system, management of change, managerial strategy in changing environment. Leadership laboratory activities. Prerequisite: Departmental approval.

390 - SPECIAL TOPICS IN AEROSPACE STUDIES
1.00 to 6.00 Credits
Topics include, but are not limited to the study of the profession of arms, leadership principles and styles, leadership assessment program, and participation in leadership labs and field training exercises. Credit may be granted for Air Force ROTC Summer Field Training and the Professional Development Program. No military obligation. Departmental permission required. Can be repeated as the topic varies.

411 - AMERICAN NATIONAL SECURITY 1
5.00 Credits
Role of the President, the Congress and the National Security Council in national security policy making; American defense strategy; alliances; regional security; arms control. Leadership Laboratory activities. Prerequisite: Departmental approval.

412 - AMERICAN NATIONAL SECURITY 2
5.00 Credits
Air Force officer as part of national security forces; military law; laws of armed conflict; the military profession; transition to military life; relations with civilian community. Leadership Laboratory activities. Prerequisite: Departmental approval.
301 - PROFESSIONALISM/LEADERSHIP
4.00 Credits
Professionalism and leadership required of the U.S. Army officer; application of leadership principles and styles through case studies and role-playing exercises with emphasis on military situations. Participation in leadership labs, physical training program and field training exercises required. Prerequisite: Department permission and completion of one of the following: ROTC basic course at BGSU; ROTC Basic Camp at Fort Knox, KY; prior Active Duty service; Army Reserve/ANG basic training.

302 - SMALL UNIT OPERATIONS
5.00 Credits
Organization and employment of basic military teams. Squad and platoon level tactical operations. Progressive leadership development through application of tactical principles. Participation in leadership labs, physical training program and field training exercises required. Prerequisite: Departmental permission.

401 - UNIT MANAGEMENT AND OFFICER DEVELOPMENT
4.00 Credits
Concepts and fundamentals of Army unit administration, supply and material readiness. Professional officership techniques and military ethics. Management at the small unit level. Organizing, planning and participating in field training exercises, participation in physical training and leadership labs. Prerequisite: Departmental permission.

402 - UNIT MANAGEMENT, MILITARY WRITING AND CORRESPONDENCE
5.00 Credits
Organization and concepts of the U.S. Army judicial system including court martial, nonjudicial and nonpunitive actions. Development of military writing techniques, preparation of staff papers and staff actions. Discussions of various administrative details pertinent to newly commissioned lieutenants. Participation in field training exercises, physical training and leadership labs. Prerequisite: department permission.

470 - STUDIES IN MILITARY SCIENCE
1.00 to 3.00 Credits
Offered on demand. Detailed study of selected military subjects. Offered on lecture basis in seminar or independent study depending on students’ needs and nature of material. May be repeated to six hours. Prerequisite: Consent of instructor. Formerly ARMY 471.

DEPARTMENT OF ART

Professor Chesser (Chair); Associate Professor Greavu; Assistant Professor Mancuso; Instructors Eddings, Rowe

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 the following courses: 100, 150, 160, 170, 210, 222, 250, 251, 255, 265, 310, 320, 330, 350, 355, 360, 375, 385 plus 12 art elective hours for a total of 76 hours.

A candidate for the Bachelor of Fine Arts degree must complete 96 hours for the major including 100, 150, 160, 170, 210, 222, 250, 251 or 355, 265, 310, 320, 330, 360, 375 and 385. Students concentrating in studio arts (ceramics, painting, printmaking, or sculpture) must complete a minimum of 24 hours in the area of concentration. Students concentrating in graphic design must complete four hours of 222, four hours of 223, 16 hours of 471 and TECH 240 and TECH 341.

A student may obtain a minor in art by completing 150, 160, 170, one three-dimensional course, and 12 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 Center for Teacher Education.

A public exhibition of the student’s studio work (one hour of 489) is required for graduation with a major in art for both the Bachelor of Arts and the Bachelor of Fine Arts degree.

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.

All art majors are required to enter art work in the annual student juried exhibition and majors with junior standing are required to participate in the preparation and installation of the same exhibition.
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<th>Subject - Art (ART)</th>
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<tr>
<td><strong>000 - ORIENTATION</strong></td>
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<td><strong>100 - ART</strong></td>
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<td><strong>150 - STUDIO FOUNDATIONS 1</strong></td>
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<td><strong>160 - STUDIO FOUNDATIONS 2</strong></td>
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<td><strong>170 - DRAWING WORKSHOP</strong></td>
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<td><strong>190 - SPECIAL TOPICS IN ART</strong></td>
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<td><strong>210 - FIGURE DRAWING</strong></td>
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<td><strong>222 - GRAPHIC DESIGN 1: INTRODUCTORY VISUAL COMMUNICATION</strong></td>
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<td><strong>250 - PAINTING 1</strong></td>
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<td><strong>255 - CERAMICS 1</strong></td>
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<td><strong>265 - SCULPTURE 1</strong></td>
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<td><strong>290 - SPECIAL TOPICS IN ART</strong></td>
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<td><strong>310 - ART HISTORY 1</strong></td>
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<td><strong>320 - ART HISTORY 2</strong></td>
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<td><strong>330 - ART HISTORY 3</strong></td>
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<td><strong>340 - GRAPHIC DESIGN 3: INTERMEDIATE VISUAL COMMUNICATION</strong></td>
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methods. Fundamental design research techniques are inherent to each project. Students are expected to cultivate and demonstrate an understanding of the relationships between form, function and meaning. Prerequisite: ART 223. (Formerly ART 225)

341 - GRAPHIC DESIGN 4: SERIES AND SYSTEMS  
4.00 Credits  

350 - CERAMICS 2  
4.00 Credits  
Methods and techniques of forming, decorating, glazing and firing clay bodies. Emphasis on wheel throwing. May repeat for a total of 8 hours credit. Prerequisite: ART 255.

355 - WATERCOLOR  
4.00 Credits  
Techniques and modes of painting in aqueous media. May repeat for credit to a total of 8 hours. Prerequisites: ART 150 and 160 or permission of the department.

360 – SCULPTURE 2  
4.00 Credits  
The design and construction of more complex sculptures in a variety of media and techniques. May repeat to total of 8 hours. Prerequisite: ART 265.

365 - SCULPTURE 3  
4.00 Credits  
Use of metals, oxyacetylene welding of steel, lost wax casting of bronze. May repeat for a total of 12 hours. Prerequisites: ART 265 and 360 or permission of instructor.

375 - PRINTMAKING 1  
4.00 Credits  
Methods and techniques of relief and intaglio processes. Includes woodcut, linocut, etching, drypoint, aquatint, hard and soft grounds. Prerequisites: ART 265 and 360 or permission of instructor.

385 - PRINTMAKING 2  
4.00 Credits  
Serigraphy and Lithography introduced as planographic processes in a short, intensive, workshop environment. Serigraphy, its fundamentals and basic techniques, will be introduced and demonstrated first; then, stone or metal plate lithography fundamentals and techniques. Required mastery of one of these processes and demonstration of a working understanding of the other through a body of produced work. Prerequisites: ART 150, 160, 170 or permission of the instructor. Demonstration of a working understanding of these processes through a body of produced work. Prerequisites: ART 150, 160, 170 or permission of the instructor.

390 - SPECIAL TOPICS IN ART  
1.00 to 4.00 Credits  

410 - ADVANCED CERAMICS  
4.00 Credits  
Directed study. May repeat to total credit of 12 hours. Prerequisite: 8 hours of ART 350.

415 - ADVANCED PRINTMAKING  
4.00 Credits  
Directed study. May repeat to total credit of 12 hours. Prerequisite: 8 hours of ART 375 and/or 385.

420 - ADVANCED PAINTING  
4.00 Credits  
Directed study. May repeat to total credit of 12 hours. Prerequisite: 8 hours of ART 250 and 251.

440 - GRAPHIC DESIGN 5: ADVANCED VISUAL COMMUNICATION  
4.00 Credits  
Continuation of ART 341. Extended investigation into consumer-oriented projects, three-dimensional design objects and other visual communications with a wide range of audiences. Assignments emphasize extensive research, design theory and history, client/design relationships, professional presentation skills, and cultivation and demonstration of relationships between form, function, content and meaning. Prerequisite: ART 341.

471 - INTERNSHIP  
8.00 to 16.00 Credits  
Supervised field experience in an approved commercial art studio, agency, design department, museum, gallery or arts organization. Application must be made through the advisor to the department chairman not later than one full quarter in advance of enrollment. Prerequisites: Junior or senior rank; ART 150, 160, and 222; and permission of the department.

489 - SENIOR THESIS  
1.00 Credit  
Required of all art majors. Preparation for and evaluation of the comprehensive examination and exhibit. Arrangements must be made one quarter in advance with the advisor and the department chairman.

490 - SPECIAL TOPICS IN ART  
1.00 to 4.00 Credits  

494 - SEMINAR IN ART  
1.00 to 4.00 Credits  

497 - INDEPENDENT STUDY IN ART  
1.00 to 4.00 Credits
DEPARTMENT OF BIOLOGICAL SCIENCES

Professors Anderson, Hoagstrom, Keiser (Chair), Moore, Nelson, Young; Associate Professor Suniga; Assistant Professors Aulthouse, Swanson, Woodley; Visiting Assistant Professor Jung; Instructor Haines; Assistant Instructor Magaw; Adjunct Faculty Ahmed, Bathalon, Crawford, Johnson, Jurgens, Lange, Meyer, Mukerjee, Novak, Shriber, Sreenan

Students majoring in the department will be exposed to a wide range of academic disciplines within biology and environmental studies, including current instrumentation and research techniques and written and oral scientific communication methods. Biology 121 is a principles course with a major emphasis on the study of the cell, genetics, evolution, and ecology. 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 122 which surveys the animal kingdom, and Biology 123 which explores general botany and the fungi. These courses also provide a firm foundation for advanced work in biology and the related applied sciences.

The Bachelor of Arts and Bachelor of Science degrees are available to biology majors with the opportunity to specialize in premedical sciences (including predentistry, premedicine, preoccupational therapy, prephysical therapy and preveterinary medicine), health technology, environmental testing, field biology, and life science licensure. In addition, many students find it desirable and a career advantage to have a second major during their undergraduate program.

Special Requirements
1. Successful completion of AASG 300 Job and Graduate School Search Techniques.
2. Minimum 2.00 cumulative gpa in all biology courses.

Major in Biology

Core Requirements:
BIOL 121 General Biology
BIOL 122 General Zoology
BIOL 123 General Botany
BIOL 195 Orientation

“Capstone Experience”
Choose one course or sequence:
BIOL 494 Biology Senior Seminar
BIOL 295, 395, 495 Research Sequence

Molecular/Cellular Course
Choose one course:

Physiology/Anatomy Course
Choose one course:
BIOL 231 Anatomy and Physiology
BIOL 301 Developmental Anatomy
BIOL 302 Human Anatomy
BIOL 308 Plant Anatomy
BIOL 310 Plant Physiology
BIOL 331 Physiology 1
(All must include a laboratory component)

Field Biology/Ecology Course
Choose one course:
BIOL 213 Natural History
BIOL 251 Principles of Ecology
BIOL 271 Intro. to Marine Biology

Systematics/Evolution Course
Choose one course:
BIOL 204 Systematic Plant Survey
BIOL 223 Invertebrate Zoology
OR
Choose two courses:
BIOL 363 Ornithology
BIOL 364 Herpetology
BIOL 368 Ichthyology
BIOL 490 Mammalogy

A minimum of 16 biology elective hours is chosen from among the following courses excluding those which have been taken as required core courses above:
BIOL 201 Environment and Man
BIOL 204 Systematic Plant Survey
BIOL 210 Introductory Genetics
BIOL 213 Natural History
BIOL 217 Intro to Molecular Biology
BIOL 223 Invertebrate Zoology
BIOL 231-32 Anatomy and Physiology 1, 2
BIOL 233 Exercise Physiology
BIOL 251 Principles of Ecology
BIOL 263 Biogeography
BIOL 271 Intro to Marine Biology
BIOL 290 Special Topics in Biology
BIOL 301 Developmental Anatomy
BIOL 302 Human Anatomy
BIOL 303 Histology
BIOL 305 Environmental Toxicology
BIOL 308 Vascular Plant Anatomy
BIOL 310 Plant Physiology
BIOL 311 Microbiology
BIOL 321 Intro to Immunology
BIOL 331-33-33 Physiology 1, 2, 3
BIOL 343 Histological Techniques
BIOL 351 Cell Biology
BIOL 360 North American Mammals
BIOL 361 Entomology
BIOL 362 Parasitology
BIOL 363 Ornithology
BIOL 364 Herpetology
BIOL 366 Radiation Biology
BIOL 368 Ichthyology
BIOL 371  Advanced Marine Biology  
BIOL 372  Topics in Marine Biology  
BIOL 383  Animal Behavior (Ethology)  
BIOL 397*  Self Directed Studies in the Biological Sciences  
BIOL 423  Topics in Ecology and Biogeography  
BIOL 451  Advanced Topics in Cell Biology  
BIOL 481*  Internship Program  
BIOL 490  Special Topics in Biological Sciences  
BIOL 497*  Independent Study in Biology  

*Individually or collectively may count for only 7 hours of the 16 biology elective hours. Credit cannot be granted for both 231 and 331 or 232 and 332.

A minimum of 47 biology hours is required for both the B.S. and B.A. degree. Departmental advisors will assist students in selecting relevant electives.

**B.S. Degree - Required Cognates (25 hrs.)**
Three courses in chemistry  
Three courses in mathematics  
One course in computer science  
PLUS two additional science courses (courses in physics strongly recommended)  
Specific science courses taught in the College of Engineering are acceptable cognates. Kinesiology (HPES 223) offered by the department of health, physical education and sport studies may count with permission of the biological sciences faculty.

**B.S. Degree - Additional Requirements**
Any additional courses in Biology, Chemistry, Mathematics, Physics, or GEOL 280 (20 hours)**

**These hours may also be satisfied by taking courses in the College of Engineering and Pharmacy but all are subject to approval of the biological sciences faculty.**

**B.A. Degree - Required Cognates (25 hrs.)**
Three courses in chemistry  
Two courses in mathematics  
One course in computer science, physics, or an additional mathematics course.

**Major in Environmental Studies**
(Minimum 56 qtr. hrs. of Biology)

The department of biological sciences also offers a major in environmental studies. Students studying in this area are pursuing careers with industrial firms, consulting firms and governmental agencies.

**Core Requirements:**
BIOL 121  General Biology  
BIOL 122  General Zoology  
BIOL 123  General Botany  
BIOL 195  Orientation  
BIOL 201  Environment and Man  
BIOL 213  Natural History  
BIOL 223  Invertebrate Zoology  
BIOL 240  OSHA-40-Hour Safety Training  
BIOL 251  Principles of Ecology  
BIOL 305  Environmental Toxicology  
BIOL 311  Microbiology  
BIOL 482  Internship  
PLUS Any two of the following:
BIOL 361  Entomology  
BIOL 363  Herpetology  
BIOL 366  Radiation Biology  
BIOL 368  Ichthyology  
BIOL 490  Mammalogy  
BIOL 490  Plant Taxonomy  

Additional biology electives (above the 56 quarter hours required) may also be added (see list of electives under Major in Biology).

**Required Cognates:**
GEOL 280  Geology  
PLSC 306  Environmental Law  
PHIL 310  Environmental Ethics  
CE 203  Surveying  
CE 321  Environmental Science  
CE 323  Solid and Hazardous Waste Management  
CE 371  Urban Planning  
MGMT 333  Management and Organizational Behavior  

One year of chemistry including
CHEM 115  Environmental Chemistry  
PHYS 100  Physics  
OR
PHYS 211  General Physics: Mechanics of Solids and Fluids  
PLUS Three courses in math and one course in computer science  
PLUS Six courses in the social sciences, business or public relations (must be advisor approved)

Additional courses in chemistry are also recommended for those wishing to pursue graduate studies. The department will make every effort to tailor the program to meet individual goals and needs of the student.

**Major in Molecular Biology**
A major in Molecular Biology provides the necessary training for students to pursue careers in the biotechnology industry and research in cell and molecular biology and provides excellent preparation for graduate and medical school.
Core Requirements:
BIOL 121 General Biology
BIOL 122 General Zoology
BIOL 123 General Botany
BIOL 195 Orientation
BIOL 210 Introductory Genetics
BIOL 217 Intro. to Molecular Biology
BIOL 311 Microbiology
BIOL 351 Cell Biology
BIOL 451 Adv. Topics in Cell Biology
CHEM 251-52-53 Organic Chemistry 1, 2, 3
CHEM 311 Chem. Of Biological Molecules
CHEM 312 Chemistry of Metabolism
CHEM 414-15-16 Biochemistry Laboratory 1, 2, 3
PLUS one of the Research Sequences below:
BIOL 295, 395, 495
CHEM 481, 482, 483

Required Cognates:
CHEM 171-72-73 Introductory Chemistry 1, 2, 3
Three courses in mathematics (preferable sequence)
MATH 163-64-65 Calculus 1, 2, 3
PLUS One course in computer science
PLUS
PHYS 211 General Physics: Mechanics of Solids and Fluids
PHYS 212 General Physics: Sound, Heat, and Light
PHYS 213 General Physics: Electricity and Magnetism
(all with labs)
OR
PHYS 231 Physics: Mechanics of Solids and Fluids
PHYS 232 Physics: Heat, Sound, and Light
PHYS 233 Physics: Electricity and Magnetism
(all with labs)

Life Science Licensure with a Major in Biology

The life science licensure program in biology is nationally accredited by the National Council for Accreditation of Teacher Education (NCATE).

Biology Requirements: (Minimum 48 qtr. hrs.)
BIOL 121 General Biology
BIOL 122 General Zoology
BIOL 123 General Botany
BIOL 204 Systematic Plant Survey
BIOL 210 Introductory Genetics
BIOL 223 Invertebrate Zoology
BIOL 251 Principles of Ecology
BIOL 311 Microbiology
BIOL 351 Cell Biology
PLUS one of the following:
BIOL 231 Anatomy and Physiology 1
BIOL 301 Developmental Anatomy
BIOL 302 Human Anatomy
BIOL 331 + 334 Physiology 1 and Physiology Lab 1
PLUS the Biology Research Sequence
BIOL 295, 395, 495
And a minimum of 5 quarter hours of biology electives not included above. (See list of electives under Major in Biology.)

Science Cognates: (Minimum 24 qtr. hrs.)
CHEM 171-72-73 Introductory Chemistry 1, 2, 3
PLUS One of the following:
PHYS 100 Physics
PHYS 211 General Physics: Mechanics of Solids and Fluids
(plus lab)
PHYS 231 Physics: Mechanics of Solids and Fluids
(plus lab)
PLUS one of the following:
PHYS 252 Earth Science and Planetary Astronomy
GEOL 280 Geology
Additional electives in biology, chemistry, physics and/or earth science must be selected to complete a total of 75 quarter hours of science.

Math Cognates:
Three courses in mathematics which must include at least one of the following:
MATH 122 College Trigonometry
MATH 154 Calculus for Life Sciences 1
MATH 160 Pre-Calculus Mathematics
MATH 163 Calculus 1
PLUS one course in computer science

The life science licensure student must also complete the education component of the program, including required field experiences and student teaching.

Biological Sciences Minors

The department offers minors in biology, environmental studies, biomedical sciences and field biology.
Students who are Biology Majors may add an Environmental Studies, a Biomedical Sciences or a Field Biology Minor by taking all required courses for their major and chosen minor plus twelve additional quarter hours in
Environmental Studies Majors may add a Biology or Biomedical Sciences Minor by taking all the requirements of their major and of the chosen minor. Environmental Studies Majors may also add a Field Biology Minor by taking all the requirements of their major and minor plus twelve additional quarter hours in biology applicable to either the major or minor. Molecular Biology Majors may add an Environmental Studies, a Biomedical Sciences or a Field Biology Minor by taking all required courses for their major and chosen minor plus twelve additional quarter hours in biology applicable to either the major or minor.

Students pursuing a degree in Medical Technology (BSMT) may add a Biology, Environmental Studies or Field Biology Minor by taking all the requirements in their program and the chosen minor.

Non-majors may take two minors by taking all required courses for each of the minors plus twelve additional quarter hours of biology.

Minor in Biology (Minimum 30 qtr. hrs. of Biology)

Core Requirements (28 qtr. hrs.)
BIOL 121 General Biology
BIOL 122 General Zoology
BIOL 123 General Botany

Molecular/Cellular Course
Choose one course:
BIOL 210 Introductory Genetics
BIOL 217 Intro. to Molecular Biology
BIOL 351 Cell Biology

Physiology/Anatomy Course
Choose one course:
BIOL 231 Anatomy and Physiology
BIOL 301 Developmental Anatomy
BIOL 302 Human Anatomy
BIOL 308 Vascular Plant Anatomy
BIOL 310 Plant Physiology
BIOL 331 Physiology 1
(All must include a laboratory component)

Field Biology/Ecology Course
Choose one course:
BIOL 213 Natural History
BIOL 251 Principles of Ecology
BIOL 271 Intro. to Marine Biology

Systematics/Evolution Course
Choose one course:
BIOL 204 Systematic Plant Survey
BIOL 223 Invertebrate Zoology
OR
Choose two courses:
BIOL 363 Ornithology
BIOL 364 Herpetology

BIOL 368 Ichthyology
BIOL 490 Mammalogy

Additional Biology hours (at least 2 hours) can be selected from biology electives not selected from the above. (See list of electives under Major in Biology.)

Required Cognates (12 qtr. hrs.)
Any combination of mathematics, chemistry, physics, or GEOL 280.

Minor in Biomedical Sciences
(Minimum of 30 qtr. hrs. of Biology)

Core Requirements (28 qtr. hrs.)
BIOL 121 General Biology
BIOL 122 General Zoology
BIOL 124 Intro. to Human Anatomy and Histology
PLUS
BIOL 231-32-33 Anatomy and Physiology 1, 2 and Exercise Physiology
OR
BIOL 331-32-33 Physiology 1, 2, 3, (all with labs)
PLUS
BIOL 301 Developmental Anatomy
OR
BIOL 302 Human Anatomy

Additional Biology hours (at least 2 hours) must be selected from the following electives not selected from the above:
BIOL 210 Introductory Genetics
BIOL 301 Developmental Anatomy
BIOL 302 Human Anatomy
BIOL 303 Histology
BIOL 311 Microbiology
BIOL 321 Intro. to Immunology
BIOL 351 Cell Biology
BIOL 362 Parasitology

Required Cognates (12 qtr. hrs.)
Any combination of mathematics, chemistry, or physics.

Minor in Environmental Studies
(Minimum 30 qtr. hrs. of Biology)

Core Requirements (30 qtr. hrs.)
BIOL 121 General Biology
BIOL 122 General Zoology
BIOL 123 General Botany
BIOL 201 Environment and Man
BIOL 251 Principles of Ecology
BIOL 305 Environmental Toxicology
BIOL 311 Microbiology
PLSC 306 Environmental Law

BIOLOGICAL SCIENCES
Required Cognates  (12 qtr. hrs.)
Any combination of mathematics, chemistry, physics, or GEOL 280

Minor in Field Biology (Minimum 30 qtr. hrs. of Biology)

Core Requirements  (24 qtr. hrs.)
BIOL 121 General Biology
BIOL 122 General Zoology
BIOL 123 General Botany
PLUS
BIOL 213 Natural History
OR
BIOL 251 Principles of Ecology
PLUS any two of the following (not included above):
BIOL 213 Natural History
BIOL 251 Principles of Ecology
BIOL 271 Intro. to Marine Biology
BIOL 363 Ornithology
BIOL 490 Mammalogy
BIOL 490 Plant Taxonomy

Additional Biology hours (at least 6 hours) must be selected from the following electives not selected from the above:
BIOL 204 Systematic Plant Survey
BIOL 213 Natural History
BIOL 223 Invertebrate Zoology
BIOL 251 Principles of Ecology
BIOL 263 Biogeography
BIOL 271 Intro. to Marine Biology
BIOL 360 North American Mammals
BIOL 361 Entomology
BIOL 363 Ornithology
BIOL 364 Herpetology
BIOL 368 Ichthyology
BIOL 383 Animal Behavior (Ethology)
BIOL 490 Mammalogy
BIOL 490 Plant Taxonomy

Required Cognates  (12 qtr. hrs.)
Any combination of mathematics, chemistry, physics, or GEOL 280.

The Ohio Northern University Metzger Nature Center, a 70-acre property in Tuscarawas County, Ohio, serves as a biology field station. The facility is located near Ragersville, and includes a century-old farm house and a new academic residence center to be completed by December 2000. Laboratories, computer labs, room and board facilities are part of the complex. The hills, valleys, woods, fields, stream, and pond provide an excellent opportunity for teaching, study, and research.

The department of biological sciences has an internship program in which it has formed working relationships with a number of organizations and institutions. The one term senior year internship provides an off-campus practical experience in areas of the biological sciences. Examples of possible internships include toxic waste management, environmental consulting, zoo animal care and management, wildlife and fisheries management, laboratory research, cardiology, cardio-pulmonary technology, biomedical computer, hospital and technical health programs. Before embarking on an internship, students must complete at least three years of courses in biology and related areas. The internship must be approved by the faculty of the department prior to registration.

Bachelor of Science in Medical Technology (BSMT)

The department of biological sciences offers a medical technology program leading to a Bachelor of Science in Medical Technology. Both 3 + 1 and 4 + 1 programs are available. Affiliate hospitals are Riverside Hospital in Toledo, Ohio, the Cooperative Medical Technology Program of Akron, Ohio and St. Vincent’s Health Center in Erie, Pennsylvania.

General Education Requirements for the 3 + 1 program: (Minimum 52 qtr. hrs.)

Two courses in mathematics (one should be a statistics course)
One course in computer science
One religion course
One fine arts course
One non-western course (see selection under College of Arts and Sciences)
ENGL 110-111 Writing 1, 2
ENGL 204 Great Works
HIST 110 Western Civilization 1
PSYC 100 Psychology
COMM 211 or 225 Public Speaking or Interpersonal Communication

and three courses in Physical Education including one in the Fitness Area, one in the Lifetime Activities Area, and one in the Wellness Area. (see listing of Physical Education Service Courses in Department of Health, Physical Education, and Sport Studies)

Satisfactory participation in the third-year assessment program is also required.

Biology Requirements:  (Minimum 52 qtr. hrs.)
BIOL 121 General Biology
BIOL 122 General Zoology
BIOL 124 Intro. to Human Anatomy and Histology
BIOL 195 Orientation
BIOL 210 Introductory Genetics
BIOL 217 Intro. to Molecular Biology
BIOL 223 Invertebrate Zoology
BIOL 301 Developmental Anatomy
BIOL 303 Histology
BIOL 311 Microbiology
Subject - Biological Sciences (BIOL)

103 - LIFE AND EARTH SCIENCE FOR EARLY & MIDDLE CHILDHOOD MAJORS
4.00 Credits
Consideration of the life sciences, including the following topics: cell biology, genetics, animal anatomy and physiology (primarily human), plant anatomy and physiology, evolution and ecology. Aspects of earth science as they affect and have affected life on earth including: weather, climate, glaciers, extraterrestrial impacts and continental drift. The roles of energy, material and information are emphasized. Some science teaching methods are included. For early childhood and middle childhood majors only. Prerequisite: CHEM 102.

121 - GENERAL BIOLOGY
4.00 Credits
Biological principles of plant and animal life with emphasis on cell biology, genetics and major concepts in evolution and ecology. Laboratory material is made available and discussed when appropriate.

122 - INTRODUCTION TO ZOOLOGY
4.00 Credits
The classification of major animal groups, and structure of animals from a comparative systems viewpoint. Prerequisite BIOL 121.

123 - GENERAL BOTANY
4.00 Credits
Microbes, fungi and plants emphasizing classification and evolutionary relationships. The life histories, anatomy and physiology of fungi and plants. Prerequisite: BIOL 121.

124 - INTRODUCTION TO HUMAN ANATOMY AND HISTOLOGY
4.00 Credits
The gross anatomy and histology of the human body system. Laboratory includes skeletal material, histology, radiographs, and cat dissection. Corequisite: BIOL 126. Prerequisite: BIOL 122.

195 - ORIENTATION (1+0)
1.00 Credit
Presentations and discussions relating to adjustment and requirements of academic life within the University, College and the Department of Biological Sciences. Graded S/U.

196 - ALLIED MEDICAL SCIENCES ORIENTATION
1.00 Credit
General orientation for students intending to pursue pre-professional programs in physical therapy and occupational therapy. Course will involve professionals from surrounding medical centers and masters-level programs. Graded S/U.
201 - ENVIRONMENT AND MAN
4.00 Credits
The interaction of man and his surroundings with an emphasis on the problems arising from increasing human population, pollution, and resource use. (Formerly BIOL 125).

204 - SYSTEMATIC PLANT SURVEY (2+4)
4.00 Credits
Plant and algal relationships concentrating on phylogeny and classification. The morphology, development and life cycles of selected taxa will be examined. Prerequisite: BIOL 123.

210 - INTRODUCTORY GENETICS
4.00 Credits
Mendelian, molecular and population genetics. Bacteriophages, bacteria, Drosophila, corn and humans will be studied for their historical and technological significance. Molecular information transfer and the regulation of gene expression will be analyzed in some depth. The laboratory focuses on an experimental analysis of fundamental genetic principles. Prerequisites: BIOL 121, 122 and 123; one year of chemistry.

213 - NATURAL HISTORY (1+6)
4.00 Credits
The recognition, identification, and understanding of local biotic communities and their inhabitants. Field study is emphasized. Prerequisite: BIOL 122 or permission of the instructor.

217 - INTRODUCTION TO MOLECULAR BIOLOGY (3+3)
4.00 Credits
The basic molecular processes of DNA, RNA, and protein synthesis. The regulation mechanisms used by viruses will be analyzed. The laboratory will emphasize gel electrophoresis techniques. Previous experience in organic chemistry is recommended. Prerequisite: one year of biology.

223 - INVERTEBRATE ZOOLOGY (3+3)
4.00 Credits
Invertebrate relationships including morphology, physiology, life cycles and taxonomy. Prerequisite: BIOL 122.

231 - ANATOMY AND PHYSIOLOGY 1 (3+3)
4.00 Credits
Basic principles of human structure and function. Cell physiology, histology, skin, connective tissue, neural, muscular and endocrine physiology and anatomy. Prerequisite: BIOL 122; BIOL 124 recommended.

232 – ANATOMY AND PHYSIOLOGY 2 (3+3)
4.00 Credits
Continuation of 231. The blood, digestive, reproductive, cardiovascular, and respiratory systems. Prerequisite: BIOL 231.

233 - EXERCISE PHYSIOLOGY (3+3)
4.00 Credits
The physiological basis of exercise and training. Metabolism, muscle physiology, cardiovascular physiology and special topics in exercise physiology. Laboratory covers techniques for evaluating physical conditioning as related to lecture topics. Prerequisites: BIOL 232 or 333.

238 - EMERGENCY MEDICAL TECHNICIAN TRAINING
1.00 Credit
Ohio Department of Public Safety certified training program. At completion of the course requirements, students may sit for the National Registry of Emergency Medical Technicians examination. Upon successful completion of the examination, the student is a nationally qualified EMT-Basic. The one hour credit will not meet any science requirement. Open to all students only with permission of the instructor.

240 - OSHA 40-HOUR SAFETY TRAINING
3.00 Credits
Practical knowledge concerning response operations for the remediation incidents involving hazardous materials. Uncontrolled (remediation) site functions, methods of operation and safety in cleaning-up hazardous substances dumped, spilled or investigations at abandoned hazardous waste sites are emphasized. Provided by arrangement with the University of Findlay at Findlay. Does not count as a biology course.

241 - BASIC EMERGENCY RESPONSE
2.00 Credits
The basic defensive and offensive mitigation techniques available to responders. Application of skills to mock emergency responses. Basic site safety; recognition, identification and notification procedures; use of survey instrumentation; risk assessment and mitigation of chemical hazards in emergency response scenarios. Prerequisite: BIOL 240. Graded S/U.

242 - GENERAL INDUSTRY SAFETY AND HEALTH COMPLIANCE
2.00 Credits
Methods of finding, interpreting and implementing government regulations pertaining to employee safety. Prerequisite: PLSC 306. Graded S/U.

243 - HAZARDOUS WASTE GENERATOR TRAINING
2.00 Credits
Hazardous waste management procedures and the implementation of contingency plans in dealing with hazardous materials. Prerequisite: BIOL 240. Graded S/U.

245 - OSHA SAFETY TRAINING REFRESHER
1.00 Credit
This eight hour workshop is designed to comply with requirements regarding annual follow-up training for hazardous waste site workers who have
previously completed BIOL 240 (OSHA Safety Training). Scheduled only in consultation with the Environmental Studies advisor in the department. Taught at the University of Findlay. May be repeated 3 times for credit. Prerequisite: BIOL 240. Does not count as a biology course. Graded S/U.

246 - HAZARDOUS MATERIALS TRANSPORTATION  
2.00 Credits 
Basic hazardous materials transportation regulations and their applications in daily operations involving the four major transportation models (air, water, rail, highways). Hazardous materials package selection, marketing, labeling, etc. for shipment of materials. Graded S/U.

251 - PRINCIPLES OF ECOLOGY  
4.00 Credits 
Consideration of the interaction of organisms with their environment at the levels of the individual, population, community and ecosystem. The laboratory consists of collection of data in the field, and analysis and interpretation of that data. Prerequisites: BIOL 122, 123 or permission of the instructor.

263 - BIOGEOGRAPHY  
5.00 Credits 
The current and historic distribution of plants and animals. Consideration of continental drift, glaciation, meteorology, climatology, ecology and evolutionary history and their effect on the current distribution of living things. Prerequisites: BIOL 122, 123 or permission of the instructor. Offered alternate years.

271 - INTRODUCTION TO MARINE BIOLOGY  
4.00 Credits 
An overview of the various marine organisms and their habitats. Particular emphasis is placed on southeastern and Gulf coastal and offshore environments. A two-week field trip to a selected marine environment is required. University defensive driving certification required. Permission of instructor required. Prerequisite: BIOL 122.

290 - SPECIAL TOPICS IN BIOLOGICAL SCIENCES  
1.00 to 4.00 Credits 
Grading system at the discretion of the instructor. May be repeated for credit as the topic varies.

295 - BIOLOGICAL LITERATURE RESEARCH  
1.00 Credit 
Selection of a research project for the senior thesis, planning the approach to the project and submission of a formal research proposal for Department approval. The research proposal will require reading and critical analysis of portions of classical and current journal articles. Attendance of all departmental and thesis seminars required. Prerequisites: BIOL 121, 122 and 123.

301 - DEVELOPMENTAL ANATOMY (2+4)  
4.00 Credits 
Human embryonic and fetal development supplemented by laboratory studies of chick and pig embryonic development. Prerequisite: BIOL 122 or equivalent.

302 - HUMAN ANATOMY (2+4)  
4.00 Credits 
The gross anatomy of the human body and body systems. Laboratories include x-rays, MRI’s, skeletal material, and cadaver dissection. Prerequisite: BIOL 122 or its equivalent.

303 - HISTOLOGY (3+3)  
4.00 Credits 
Microscopic analysis of cells, tissues, and the organ systems of the human body. Prerequisite: BIOL 122 or its equivalent. Offered alternate years.

305 - ENVIRONMENTAL TOXICOLOGY  
3.00 Credits 
Consideration of effects of both man-made and natural toxic agents on living systems. Material will emphasize aspects of physiologic toxicity in both plant and animal systems. An understanding of basic chemical, physical and biologic principles will be required. Prerequisites: BIOL 121 and two courses in Chemistry.

308 - VASCULAR PLANT ANATOMY (3+3)  
4.00 Credits 
General vascular plant anatomy, morphology and cellular ultrastructure. Structures from all major plant organs will be examined in an evolutionary, ecological, and physiological context. Prerequisite: BIOL 123. Offered alternate years.

310 - PLANT PHYSIOLOGY (3+3)  
4.00 Credits 
Various plant functions, including water relations, photosynthesis, metabolism and hormonal regulation of growth, development and stimulus response with emphasis on cellular structure/function relationships. Prerequisite: BIOL 123. Offered alternate years.

311 - MICROBIOLOGY  
4.00 Credits 
Classical microorganisms with the emphasis of the course on the various groups of bacteria and viruses. Fungi, algae and protozoa will receive only brief mention. Significance of the taxa will be discussed in reference to medical, environmental and basic research importance. Laboratory techniques for culturing, identifying and manipulating microbes will be practiced. Prerequisites: BIOL 121, 122 and 123.

312 - MICROBIOLOGY LABORATORY  
1.00 Credit 
The practice of microbiological techniques for culturing, identifying and manipulating microbes. Experimental design and data analysis will be emphasized. Corequisite: BIOL 313. Prerequisites: BIOL 121, 122, 123 or 124.
313 - INTRODUCTION TO MEDICAL MICROBIOLOGY
4.00 Credits
The fundamentals of microbiological principles using medically important organisms. Core themes include the impact of microbes on the biosphere, microbial cell biology, microbial genetics, interactions of microorganisms with humans and other organisms, microbial diversity and microbial evolution. Students cannot have credit for both BIOL 311 and BIOL 313. Prerequisites: BIOL 121, 122, 123 or 124, and one year of chemistry.

321 - INTRODUCTION TO IMMUNOLOGY
4.00 Credits
Basic anatomical, physiological, and genetic principles of immunology with considerable reference to clinical and research applications. Laboratories involve performance and demonstration of various immunoassays currently used in most areas of biological inquiry. Prerequisites: BIOL 121 and 122. BIOL 124 recommended.

322 - BIOSCIENCE LABORATORY 1
1.00 Credit
Laboratory exercises involving various subject matter in the biological sciences including physiology, human anatomy, histology, and pathology. Prerequisites: BIOL 124 and 126.

323 - BIOSCIENCE LABORATORY 2
1.00 Credit
Laboratory exercises involving various subject matter in the biological sciences including microbiology, molecular biology, and cell biology. Experimental data analysis will be emphasized. Corequisite: BIOL 333. Prerequisites: BIOL 311 or 313 and 322; PHBS 341 and 342.

331 - PHYSIOLOGY 1 (3+0)
3.00 Credits
An advanced structural and functional approach to understanding the human body. Emphasis is placed on the integration of parameters from all levels of tissue and organ system function. Prerequisites: BIOL 124 and one year of chemistry or permission of the instructor.

332 - PHYSIOLOGY 2 (3+0)
3.00 Credits
Continuation of 331. Prerequisite: BIOL 331.

333 - PHYSIOLOGY 3 (3+0)
3.00 Credits
Continuation of 332. Prerequisite: BIOL 332.

334 - PHYSIOLOGY LAB 1 (0+3)
1.00 Credit
Hands-on experiments investigating neural and skeletal muscle physiology. Corequisite: BIOL 331.

335 - PHYSIOLOGY LAB 2 (0+3)
1.00 Credit
Hands-on experiments investigating cardiovascular and respiratory physiology. Corequisite: BIOL 332.

336 - PHYSIOLOGY LAB 3 (0+3)
1.00 Credit
Hands-on experiments investigating renal, gastrointestinal and reproductive physiology. Corequisite: BIOL 333.

343 - HISTOLOGICAL TECHNIQUES
3.00 Credits
Principles and procedures used in the preparation of biological specimens for microscopic study. Offered alternate years. Prerequisite: BIOL 124 or 303.

351 - CELL BIOLOGY (3+3)
4.00 Credits
The function, structure and growth of cells will be analyzed with an emphasis on experimental techniques. Cellular organelles studied include: endo-membrane systems, ribosomes, mitochondria and cytoskeletal elements. Prerequisites: BIOL 121, 122, 123 and CHEM 173.

360 - NORTH AMERICAN MAMMALS
4.00 Credits
The natural history, behavior, ecology and systematics of North American mammals. Representatives of all North American orders and most North American families are considered. Aspects which demonstrate general biological principles are emphasized. A weekend field trip is required. Offered alternating years, spring quarter. Prerequisite: BIOL 122.

361 - ENTOMOLOGY
4.00 Credits
The principles of entomology including the morphology, ecology, evolution and taxonomy of insects. A collection of a minimum 100 insects identified to family is required. The collection requirement may be met with a collection of fifty photographs of insects identified to family. Prerequisite: BIOL 122. BIOL 223 strongly recommended.

362 - PARASITOLOGY
4.00 Credits
The principles of parasitology, including the ecology, evolution and taxonomy, immunology and pathology of the protozoan and metazoan parasites. Major human and veterinary parasites, including their distribution, pathology and control. Offered alternate years. Prerequisite: BIOL 122. BIOL 223 strongly recommended.

363 - ORNITHOLOGY
4.00 Credits
The learning and identification of about 200 Ohio avian species. Lectures cover the biology of birds and the reading of library material. The laboratory includes fieldwork, techniques for studying birds, journal writing, and preparation of a museum study skin. Prerequisite: BIOL 122.
364 - HERPETOLOGY
3.00 Credits
The biology of amphibians and reptiles with particular emphasis on the major taxonomic groupings. Morphology, behavior, systematics and the significance to man are examined. Field exercises at a major natural history museum and zoological park are required. Offered alternate years. Prerequisite: BIOL 213.

366 - RADIATION BIOLOGY
4.00 Credits
Interaction of radioactive decay particles with matter, the principles of radiological health and safety, and the biological effects of radiation. Offered alternate years.

368 - ICHTHYOTOLOGY
4.00 Credits
Fish biology with particular emphasis on the freshwater teleosts inhabiting Ohio waters. Considerable emphasis placed on field exercises, techniques and systematics. University defensive driving certification required. Prerequisite: BIOL 122.

371 - ADVANCED MARINE BIOLOGY
4.00 Credits
The unifying concepts of marine biology including biological, physical and chemical aspects. Emphasis will be on various organisms and their interactions with their environments. A two-week field trip to a selected marine environment is required. Prerequisites: BIOL 271 and permission of the instructor.

372 - TOPICS IN MARINE BIOLOGY
4.00 Credits
Selected areas of marine biology may be selected for in-depth study. Specific study areas include marine ichthyofauna, marine plankton, marine arthropods, marine molluscs, marine phyology, marine mammalogy, marine physiology and others. A field experience will be required. Prerequisites: BIOL 371 and permission of the instructor. May be repeated once for credit.

383 - ANIMAL BEHAVIOR (ETHOLOGY) (3+2)
4.00 Credits
Basic principles of the behavior and ethology of invertebrates and vertebrates, stressing observational and descriptive techniques. Offered alternate years. Prerequisites: BIOL 121, 122 and 223.

395 - BIOLOGICAL RESEARCH REPORT
1.00 Credit
Working with a research advisor, investigation of the project proposed in BIOL 295, and preparation and submission of a written report in approved scientific format. Report must detail the progress of the senior thesis research including a literature review and work completed to date. Attendance at all departmental and thesis seminars required. Prerequisite: BIOL 295.

397 - SELF-DIRECTED STUDIES IN THE BIOLOGICAL SCIENCES
1.00 to 2.00 Credits
An opportunity for students to investigate specialty fields within the biological sciences by utilizing interactive and/or multi-media programs. Various self-directed topics will be offered, e.g Hematology. A maximum of 3 hours may be counted towards the major. This course cannot be used as a general education class. Prerequisites: BIOL 121, 122, 123 or 124. Graded S/U.

423 - TOPICS IN ECOLOGY AND BIOGEOGRAPHY
3.00 Credits
Current literature on selected topics in Ecology and Biogeography. Prerequisites: BIOL 251, 263 or permission of instructor. Offered alternate years. May be repeated for credit.

451 - ADVANCED TOPICS IN CELL BIOLOGY
3.00 Credits
Current literature on selected topics in cell biology. Prerequisite: BIOL 351 or PHBS 342. May be repeated for credit as the topic varies.

481 - INTERNSHIP PROGRAM
16.00 Credits
Practical experience in areas such as wildlife/fisheries biology, zookeeping, environmental monitoring, cardio-pulmonary technology, pro-health programs and other specializations. Internships for which credit hours are also offered by another department are acceptable as long as the credit hours total 16 quarter hours. All departments involved must agree with the internship arrangement. Prerequisites: normally restricted to seniors, must be approved by biological sciences faculty, and a minimum of 3 years work in the fundamentals of biology and related areas. Graded S/U.

482 - INTERNSHIP IN ENVIRONMENTAL STUDIES
16.00 Credits
Required experience in areas of environmental studies such as monitoring, compliance, and consulting. Prerequisite: Senior standing.

490 - SPECIAL TOPICS IN BIOLOGICAL SCIENCES
1.00 to 4.00 Credits
Disciplines such as mammalogy and plant taxonomy. May be repeated for credit as topic varies.

494 - BIOLOGY SENIOR SEMINAR
1.00 Credit
The presentation of a library research topic in both written and oral formats. Additionally a biology comprehensive examination must be passed with a grade of 70% or better. Previous or concurrent enrollment in AASG 300. Attendance at all departmental and thesis seminars required. Prerequisite: junior or senior status.
495 - SENIOR THESIS SEMINAR
1.00 Credit
Written and oral presentation of the senior research project. The completed research project will be written in a format acceptable for submission to a scientific journal and presented during a formal seminar. Attendance at all departmental and thesis seminars required. Prerequisite: BIOL 395.

497 - INDEPENDENT STUDY IN BIOLOGY
1.00 to 3.00 Credits
Graded S/U.

280 - GEOLOGY
4.00 Credits
Physical geology and paleogeology, including chemical properties of minerals and rocks, geologic processes, and earth materials, and how these relate to the formation and preservation of plant and animal fossils. Fossils from the major geologic eras will be surveyed and reviewed in an evolutionary and ecological context. Prerequisites: BIOL 121, 122 or 123, or permission of instructor. Does not count as a biology course, but will count as a physical science requirement in both the BA and BS programs.

290 - SPECIAL TOPICS IN GEOLOGY
1.00 to 4.00 Credits
May be repeated for credit up to a total of 8 hours as the topic varies.

297 - INDEPENDENT STUDY IN GEOLOGY
1.00 to 3.00 Credits
Independent study in geology. Prerequisite: GEOL 280 or permission of instructor. Graded S/U.

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

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

464 - MICROBIOLOGY LABORATORY
8.00 Credits
Laboratory methods, procedures, and instrumentation to correlate with Bacteriology, Mycology, and Parasitology lectures.

465 - IMMUNOHEMATOLOGY LECTURE
3.00 Credits
Theory of human blood groups, compatibility testing, detection, and identification of antibodies.

466 - IMMUNOHEMATOLOGY LABORATORY
3.00 Credits
Laboratory methods and instrumentation to correlate with lectures.

467 - CLINICAL IMMUNOLOGY LECTURE
2.00 Credits
Theory of information and detection of antigens and antibodies in disease states, both in vivo and in vitro.

468 - CLINICAL IMMUNOLOGY LABORATORY
2.00 Credits
Laboratory methods and instrumentation to correlate with lectures.

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

470 - CLINICAL HEMATOLOGY/COAGULATION LABORATORY
4.00 Credits
Laboratory instrumentation and procedures to correlate with the lectures.

471 - CLINICAL CHEMISTRY LECTURE
8.00 Credits
Theory of chemical constituents of body fluids in normal and disease states. Includes General Chemistry, Toxicology and DIA, Instrumentation, Statistics and Quality Control.
DEPARTMENT OF CHEMISTRY

Professors Canagaratna, Hawbecker, Kurtz (Chair), Lamb, Peterson, Sadurski; Associate Professors S. Bates, Gray; Assistant Professor Broekemeier; Visiting Assistant Professor Illich; Director of Laboratories Dawes

The department of chemistry prepares students for research and careers in physical and medical sciences. Students master methods in mathematics and physical sciences while developing competence to identify, analyze, and solve scientific problems. The department also meets the need of non-technical students for an understanding of scientific methods and insights as they apply to the world of the mind and to decision making in a free society.

The department of chemistry is on the list of departments approved by the American Chemical Society for the professional education of Chemists and Biochemists, and offers both the Bachelor of Science and Bachelor of Arts degrees.

Departmental Majors Five programs are available in the department of chemistry. They are the American Chemical Society Approved Chemistry Major, the Chemistry Major basic program, the Chemistry Major modified program, the American Chemical Society Approved Biochemistry Major, and the Medicinal Chemistry Major.

The Chemistry Major
American Chemical Society Approved Program

Students desiring ACS Certification in Chemistry complete a program designed to prepare for graduate studies in chemistry or environmental science or direct entry into the chemical industry. Students may select either a B.A. or a B.S. degree.

The following core chemistry courses are required for the chemistry major: Chemistry 000, 181-182-183, 261-262-263, 271, 300, 304, 324, 341-342-343, 351 and 494. To this core must be added a “professional” component which includes Chemistry 311, 451, 462, and 5 credit hours from among Chemistry 473, 474, 481, 482, 483, and 300 level or above mathematics or physics courses approved by the chemistry department. The following cognates are required: Mathematics 163-164-165; a chemistry department approved computer science course; and Physics 231-232-233 with related laboratories.

The Basic Program

Premedical students and students seeking a less technical path into graduate and professional schools or chemical industry may select the basic program with a B.S. or B.A. degree. This program includes the core and cognate courses listed above, but does not require the “professional” chemistry component.

The Modified Major

A modified program is available for those who seek careers in chemically related areas such as chemical sales, patent law, science writing, or scientific information retrieval. It is designed individually in order to permit additional courses to be taken in the area which supports the entrant’s chemistry related career goal. Entrance into the modified major must be approved by the department, and students selecting this program are expected to complete a second major or teacher licensure. High school physical science licensure at ONU is approved by the National Science Teachers Association and the State of Ohio. All modified programs include Chemistry 000, 181-182-183, 261-262-263 and 494, plus three courses from among 304, 311, 324, 337, 341-342-343. In addition the entrant must select a minimum of twelve credit hours of 300-400 level courses in the division of mathematics and natural sciences or other 300-400 level courses acceptable to the chemistry department. PHBS Biochemistry 341 and 342 may be substituted for Chemistry 311. Two of the following cognates must also be taken: Physics 211-212-213 or 231-232-233 with related laboratories; Biology 121-122-123; three mathematics courses at the level of 120 or above.
The American Chemical Society Approved Biochemistry Major

This program is designed to prepare students for professional employment as biochemists and for graduate or professional studies in biochemistry, toxicology, molecular genetics, and related fields. The following core courses are required: Chemistry 000, 181-182-183, 261-262-263, 271, 300, 311, 321, 341-342-343, 351 and 494. To this core must be added Chemistry 312, Chemistry 414-415-416 and a minimum of two courses from among Biology 210, 311, 321, 351, and 451. Required cognates are Biology 121-122-123; Mathematics 163-164-165; a chemistry department approved computer science course; and Physics 231-232-233 with related laboratories.

The Medicinal Chemistry Major

The Bachelor of Science in medicinal chemistry is an interdisciplinary major designed for students preparing for research careers in pharmacology, medicinal chemistry, pharmaceutical sciences, or for direct employment in pharmaceutical chemistry. Required core chemistry courses are Chemistry 000, 181-182-183, 261-262-263, 271, 300, 304, 311-312, 341-342-343, 351, 481-482-483 or PHBS 565 and Chemistry 494. Required cognates are Biology 121-122-123; Mathematics 163-164-165; a chemistry department approved computer science course; and Physics 231-232-233 with related laboratories. The following Pharmacy College courses complete the major; PHBS 381, 562 (or BIOL 351), PHBS 443 and 444.

Minor in Chemistry

Students wishing to obtain a minor in chemistry should complete these courses: Chemistry 181-182-183 (or 171-172-173) and 261-262-263 plus two additional courses from among Chemistry 304, 312, 321, 337, 341, 342, 343, 351, or 363.

Minor in Biochemistry

Students wishing to obtain a minor in biochemistry should complete these courses: Chemistry 181-182-183 (or 171-172-173) and 261-262-263, 311 (or PHBS 341), 312 (or PHBS 342) and Chemistry 414 and 415.

Subject - Chemistry (CHEM)

000 - ORIENTATION (1+0)

1.00 Credit

Familiarization with the department, requirements for majors, planning a program of courses, university catalog, career planning and library. Required of department majors. Course graded S/U.

100 - CHEMISTRY (3+1)

4.00 Credits

The behavior of matter at the macroscopic level and explanations of this behavior using molecular-level models. Applications in everyday life. Chemistry 171 recommended for science majors. Credit may be received for either CHEM 100 or CHEM 171 but not for both.

102 - PHYSICAL AND EARTH SCIENCES- EARLY & MIDDLE CHILDHOOD MAJORS

4.00 Credits

Expressions of the nature of matter and energy in the earth (geology), atmosphere (meteorology), and space (astronomy). Includes major conceptual models in these disciplines. For early childhood and middle childhood education majors only. Prerequisite: PHYS 101.

108 - BASICS OF CHEMISTRY (4+0)

4.00 Credits

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 CHEM 171. CHEM 108 DOES NOT SATISFY A GENERAL EDUCATION REQUIREMENT AND IT CANNOT BE USED TO SATISFY SPECIFIC DEPARTMENTAL OR PROGRAM REQUIREMENTS.

114 - CHEMISTRY OF LIFE (4+0)

4.00 Credits

Chemical nature of the major groups of biological molecules and their activities in living systems. Credit may not be received for both CHEM 114 and CHEM 311 or PHBS 341. Offered alternate years. Prerequisite: CHEM 100 or 162 or 171.

115 - ENVIRONMENTAL CHEMISTRY (4+0)

4.00 Credits

Chemical aspects of the natural and polluted environment. Particular emphasis on air and water pollution. Prerequisite: CHEM 100 or 162 or 171.

162 - CHEMISTRY-CONCEPTS AND APPLICATIONS 1 (4+0)

4.00 Credits

Chemistry for engineering students. Basic chemical theories applied to practical situations. Prerequisites: High school chemistry; MATH 164; PHYS 231, 232, 233, 234, 235, 236 or equivalent of the above or approval of the department chairman.

163 - CHEMISTRY-CONCEPTS AND APPLICATIONS 2 (3+3)

4.00 Credits

Continuation of CHEM 162. Laboratory reinforces the lecture program. Prerequisite: CHEM 162.

171 - INTRODUCTORY CHEMISTRY 1 (4+3)

5.00 Credits

Macroscopic concepts of the elements, compounds and reactions. Stoichiometry, thermochemistry and properties of ideal gases as applied to reactive systems. Emphasis on acid-base, redox, and descriptive chemistry. Laboratory relates physical observations to principles presented in lecture. Credit may be received for either CHEM 100 or 171 but not for both. Prerequisite: High school chemistry or equivalent, or CHEM 108.
172 - INTRODUCTORY CHEMISTRY 2 (4+3)
5.00 Credits
Atomic theory and its application to bonding, molecular structure, condensed phases, chemical reactions and mechanisms. Laboratory supports principles presented in lecture, including spectroscopy. Prerequisite: CHEM 171.

173 - INTRODUCTORY CHEMISTRY 3 (4+3)
5.00 Credits
Physical principles controlling chemical reactions including kinetics, thermodynamics, electrochemistry, and acid-base equilibrium conditions. Laboratory supports principles presented in lecture, including kinetics and equilibrium. Prerequisite: CHEM 172.

181 - INTRODUCTORY CHEMISTRY FOR MAJORS 1 (4+3)
5.00 Credits
Same lecture and laboratory as CHEM 171.

182 - INTRODUCTORY CHEMISTRY FOR MAJORS 2 (4+3)
5.00 Credits
Same lecture and laboratory as CHEM 172. Prerequisite: CHEM 181.

183 - INTRODUCTORY CHEMISTRY FOR MAJORS 3 (4+3)
5.00 Credits
Same lecture and laboratory as CHEM 173. Prerequisite: CHEM 182.

251 - ORGANIC CHEMISTRY 1
4.00 Credits
Bonding, energetics, synthesis and mechanisms emphasized throughout the course. Electronic structure, acid-base and redox relationships among functional groups, conformational and configurational isomers, IUPAC nomenclature, Sn, E, Ad2 and Sr reactivity, and the synthesis of alkenes and alkynes. Laboratory introduces chromatographic and classical separation techniques. Elimination and substitution reactions are investigated. Credit may be received for CHEM 251 or 261, but not both. Prerequisite: CHEM 173 or 183.

252 - ORGANIC CHEMISTRY 2
4.00 Credits
Mass, ir, uv, and nmr spectroscopy in structure determination, alcohol synthesis, organometallics, nucleophilic additions to carbonyls, polyenes, aromaticity, SeAR and SnAR processes. Laboratory includes applications of spectroscopy, synthetic, and stereochemical principles, carbonyl and alkene additions, terpene identification, and aromatic substitutions. Credit may be received for CHEM 252 or 262, but not both. Prerequisite: CHEM 251.

253 - ORGANIC CHEMISTRY 3
4.00 Credits
Organic nitrogen chemistry, carbohydrates, enolate condensations, alkylation, and conjugate addition, heterocyclic chemistry, polymerization, amino acids and proteins. Laboratory emphasizes short syntheses of biological and pharmaceutical relevance. Credit may be received for CHEM 253 or 263, but not both. Prerequisite: CHEM 252.

261 - ORGANIC CHEMISTRY 1 - MAJORS
4.00 Credits
Same as Chemistry 251 lecture with Chemistry 254 Lab. Credit may be received for CHEM 251 or CHEM 261 but not for both. Prerequisite: CHEM 173 or CHEM 183.

262 - ORGANIC CHEMISTRY 2 - MAJORS
4.00 Credits
Same as Chemistry 252 lecture with Chemistry 255 lab. Credit may be received for CHEM 252 or CHEM 262 but not for both. Prerequisites: CHEM 251 or CHEM 261.

263 - ORGANIC CHEMISTRY 3 - MAJORS
5.00 Credits
Same lecture as Chemistry 253 with two credit laboratory in organic structure elucidation. Laboratory comprises traditional wet tests as well as instrumental experience with ir, uv, mass and nmr spectrometry. Inferential and critical reasoning emphasized. Credit may be received for CHEM 253 or CHEM 263 but not for both. Prerequisites: CHEM 252 or CHEM 262.

271 - CHEMICAL APPLICATIONS OF MATHEMATICS
4.00 Credits
Selected mathematical techniques used in modern chemistry as a preparation for the higher level quantitative chemistry courses (junior year Physical Chemistry, Quantitative Analysis, Chemical Instrumentation and Advanced Physical Chemistry.) Examples will illustrate the application of mathematical techniques to problems in Chemistry. Prerequisites: CHEM 181, 182, 183 or equivalent; and MATH 165.

290 - SPECIAL TOPICS IN CHEMISTRY
1.00 to 4.00 Credits
Can be repeated as the topic varies.

297 - INDEPENDENT STUDY IN CHEMISTRY
1.00 to 4.00 Credits
Can be repeated for a maximum of 6 credit hours. Prerequisite: Approval of the department chairman.
300 – INTRODUCTION TO CHEMICAL RESEARCH (1+0)
.00 Credits
Methods and objectives of chemical research. Undergraduate research opportunities in the Chemistry department. Required of all students in the Basic, ACS or Biochemistry programs prior to enrollment in CHEM 497 or 481, 482 and 483. Course graded S/U. Prerequisite: Junior standing or approval of department chairman.

304 - ORGANIC SYNTHESIS (2+6)
4.00 Credits
Major carbon skeletal alteration techniques and selective functional group transformations. Laboratory consists of planning and executing multistep syntheses of graded complexity. Use of synthetic chemical literature introduced. Prerequisite: CHEM 253 or 263.

311 - CHEMISTRY OF BIOLOGICAL MOLECULES (4+0)
4.00 Credits
Structures and properties of the major classes of biological molecules with emphasis on the physical properties of macromolecules. Includes thermodynamics, enzyme kinetics and mechanisms, coenzymes, isolation and characterization techniques and an introduction to the design and regulation of metabolic pathways. Prerequisites: CHEM 253 or 263.

312 - CHEMISTRY OF METABOLISM (4+0)
4.00 Credits
Intermediary metabolism with emphasis on the chemical reactions of glycolysis, the citric acid cycle, lipid and amino acid synthesis and degradation, and nucleic acid metabolism. Prerequisite: CHEM 311.

321 - INTERMEDIATE INORGANIC CHEMISTRY-BIOCHEMISTRY MAJORS (3+3)
4.00 Credits
Same lecture as CHEM 324 with a different laboratory. Bonding, structures, preparation, properties, compounds, and reactions of main group and transition metal elements. Laboratory involves basic methods of synthesis and characterization with selected experiments for the biochemistry major. Prerequisite: CHEM 263 or approval of the department chairman.

324 - INTERMEDIATE INORGANIC CHEMISTRY-CHEMISTRY MAJORS (3+3)
4.00 Credits
Same lecture as CHEM 321 with a different laboratory. Bonding, structures, preparation, properties, compounds, and reactions of main group and transition metal elements. Laboratory involves basic methods of synthesis and characterization. Prerequisite: CHEM 263 or approval of the department chairman.

337 - ELEMENTS OF PHYSICAL CHEMISTRY (4+0)
4.00 Credits
Principles and applications of selected areas of physical chemistry including thermodynamics, kinetics, and spectroscopy. Intended for students in the modified chemistry major or chemistry minor who wish to enhance their chemistry background. Credit may be received for CHEM 337 or CHEM 341 but not for both. Prerequisites: CHEM 163 or 252 or 262, and three courses from the Department of Mathematics and Computer Science. Offered alternate years.

339 - CHEMICAL INTERACTIONS IN ENVIRONMENTAL SYSTEMS (4+0)
4.00 Credits
Chemical interactions in the natural environment, including the effects of man’s activities on the dynamics, thermodynamics and kinetics of atmospheric, hydrospheric and lithospheric chemical systems. Taught in alternate years. Prerequisites: CHEM 163, 253 or 263.

341 - PHYSICAL CHEMISTRY 1 (3+3)
4.00 Credits
Classical thermodynamics. Laboratory illustrates principles and applications. Knowledge of computer programming recommended. Prerequisites: CHEM 253 or 263 and 271; Math 165; Phys 231, 232 and 233 with related laboratories.

342 - PHYSICAL CHEMISTRY 2 (3+3)
4.00 Credits
Quantum mechanics. Laboratory illustrates applications in spectroscopy. Knowledge of elementary differential equations recommended. Prerequisite: CHEM 341.

343 - PHYSICAL CHEMISTRY 3 (3+3)
4.00 Credits
Statistical thermodynamics, kinetic molecular theory and chemical kinetics. Laboratory illustrates principles and applications. Prerequisite: CHEM 342.

351 - INTERMEDIATE QUANTITATIVE ANALYSIS (2+6)
4.00 Credits
Practice and principles of modern chemical methods of analysis. Introduction to instrumental methods of analysis. Prerequisite: CHEM 173 or 183.
363 - APPLICATIONS OF CHEMICAL INSTRUMENTATION (1+5)
3.00 Credits
Principles and methods of instrumental measurements for the analysis of real samples. Lecture and laboratory integrated to deal with the collection, preparation and analysis of environmental, geological, biological and industrial samples. Automatic sequencing and process analysis. Prerequisite: CHEM163 or 253 or 263. Offered alternate years.

390 - SPECIAL TOPICS IN CHEMISTRY
1.00 to 4.00 Credits
Can be repeated as the topic varies.

411 - ADVANCED TOPICS IN BIOCHEMISTRY (3+0)
3.00 Credits
Behavior and characterization of biological macromolecules. Biochemical basis for hormone action, gene expression and photosynthesis. Prerequisites: CHEM 312 or PHBS 342 and CHEM 343 or approval of the department chair.

414 - BIOCHEMISTRY LABORATORY 1 (0+6)
2.00 Credits
Chemical and physical properties of biological molecules and an introduction to enzyme kinetics. Prerequisite: CHEM 312 or PHBS 342.

415 - BIOCHEMISTRY LABORATORY 2 (0+6)
2.00 Credits
Protein, nucleic acid, lipid and carbohydrate isolation and characterization. Prerequisite: CHEM 414.

416 - BIOCHEMISTRY LABORATORY 3 (0+6)
2.00 Credits
Modern methods of nucleic acid analysis with an emphasis on recombinant DNA techniques. Prerequisite: CHEM 415.

451 - ADVANCED INORGANIC CHEMISTRY (3+3)
4.00 Credits
Theory, bonding, spectroscopy, reaction mechanisms and organometallic compounds. Laboratory involves advanced methods of synthesis and characterization. Prerequisites: CHEM 321 or 324 and 343 or approval of the department chairman.

462 - ADVANCED ANALYTICAL CHEMISTRY (3+3)
4.00 Credits
Theoretical and experimental study of modern methods of instrumental analysis. Principles, design and use of chemical instrumentation. Laboratory stresses independent, investigative experimentation. Prerequisites: CHEM 343 and 351 or approval of the department chair.

473 - ADVANCED TOPICS IN PHYSICAL CHEMISTRY (4+0)
4.00 Credits
Selected topics from group theory, advanced quantum mechanics, spectroscopy and chemical dynamics. Knowledge of computer programming recommended. Prerequisite: CHEM 343.

474 - THEORETICAL ORGANIC CHEMISTRY (4+0)
4.00 Credits
Application of molecular orbital theory and various thermodynamic relationships to the study of organic reaction mechanisms. Structure-reactivity relationships are emphasized. Prerequisites: CHEM 304 and 343 or approval of the department chair.

481 - SENIOR RESEARCH 1
2.00 Credits
Prerequisites: CHEM 300 and approval of the department chairman.

482 - SENIOR RESEARCH 2
2.00 Credits
Prerequisites: CHEM 481 and approval of the department chairman.

483 - SENIOR RESEARCH 3
2.00 Credits
Prerequisites: CHEM 482 and approval of the department chairman.

490 - SPECIAL TOPICS IN CHEMISTRY
1.00 to 4.00 Credits
Can be repeated as the topic varies.

494 - SEMINAR IN CHEMISTRY (1+0)
1.00 Credit
Oral presentation and a formal paper on a chemical topic related to a selected seminar theme. Required of all senior chemistry and biochemistry majors.

497 - INDEPENDENT STUDY IN CHEMISTRY
1.00 to 4.00
Credits Can be repeated for a maximum of 6 credit hours. Prerequisite: CHEM 300 and approval of the department chair.
DEPARTMENT OF COMMUNICATION ARTS

Professors Johnson, Riess (Chair), Roberts; Associate Professors Bayliss, Gainey, Iseman, Vivian; Assistant Professors Bell (Resident Artist), Dobson

Departmental Objectives
1. To emphasize a strong liberal arts education for entering the job market or graduate study.
2. To provide a flexible program that adapts easily to individual needs and interests while maintaining professional standards.
3. To encourage critical thinking by providing students with opportunities for practical application of both historical and contemporary communication theory.
4. To encourage participation in and appreciation of the fine arts, thereby developing aesthetic standards.

Departmental Curriculum
The departmental course offerings promote understanding of the theory, practice, and aesthetics of human communication. Students majoring in communication arts pursue a concentration particular to their professional education goals.

Concentrations leading to the Bachelor of Arts degree are offered in the following areas:
- Professional and Organizational Communication
- Theatre
- Public Relations
- Broadcasting and Electronic Media

Professional and Organizational Communication provides knowledge and skills emphasizing the close relationship between effective communication and the successful operation of all organizations. The concentration prepares students for graduate study and for careers in fields such as human resources, law, business, education, personnel, and politics.

Theatre provides artistic expression of human actions. As a liberal art it is a foundation for many careers where critical thinking, analytic ability, and creative expression are important. Graduates have been successful in theatre, law, medicine, banking, public service, and graduate school. The program has an extensive production and directing focus.

Public Relations prepares students for jobs with agencies, nonprofit organizations, and corporations doing both internal and external communication tasks. Public relations majors learn how to conduct research, plan programs, produce communication materials, and carry out program evaluation.

Broadcasting and Electronic Media provides a review of the past and a preview of the future in radio, television, cable, and telecommunications. The concentration affords opportunities to develop hands-on skills for careers in broadcast production and performance, corporate audio/video, multimedia production, as well as graduate study.

A concentration leading to the Bachelor of Fine Arts degree is offered in:
- Musical Theatre

Musical Theatre provides professional training within a liberal arts environment and blends dance, music, and theatre. Students must audition for acceptance into the Musical Theatre concentration. Graduates typically pursue professional careers in the performing arts. Double majors are permitted.

Department majors as well as dual majors whose primary major is from another department/college may elect to pursue more than one concentration.

Departmental majors who are unable to fulfill specified curricular requirements in existing departmental concentrations may obtain a major in Communication Arts (without concentration) upon approval by the department Chair.

Internships are an integral part of some concentrations. Related courses outside the department are also required of some concentrations.

Minors are offered in the following areas:
- Professional and Organizational Communication
- Theatre
- Public Relations
- Broadcasting and Electronic Media
- Dance

Prelaw Program The department cooperates with the Pettit College of Law at Ohio Northern University relative to the “guaranteed admission” prelaw program. Those interested in the program and a course of studies within the department should contact the chair for information and/or advising.

Business Option A business option is available for any student majoring in communication arts. The courses for the option are in addition to concentration course work. The option is designed to provide a business focus for students within their communication career goals. See page 53 of this catalog for the Business Option courses.
Departmental Activities
Beyond the traditional classroom experience, students are encouraged to become involved in a variety of departmental activities. WONB-FM, the campus radio station, allows students to gain experience in broadcasting and management. ONU Cable TV provides students experience in campus telecommunication activities. The Public Relations Student Society of America gives students professional learning experiences through networking, workshops, campaign exposure, and service. Ohio Northern University Theatre offers opportunities for students to act in and engage in technical work for musicals, new works, readers theatre, and traditional plays. In all these activities, the department encourages student involvement. Credit toward graduation may be received from participation in some activities.

Grading Any grade below “C” that is received in a departmental course will not count toward major or minor requirements.

Communication Arts with Professional and Organizational Communication Concentration (66 hours)

I. Concentration Requirements: (54 hours)
COMM 211 Public Speaking
COMM 212 Business and Prof. Speaking
COMM 221 Interviewing

COMM 225 Interpersonal Communication
COMM 311 Persuasive Speaking
COMM 321 Group Communication
COMM 345 Organizational Communication
COMM 440 Comm. and Conflict Mgmt.
COMM 445 Issues in Professional Comm.
IBEC 100 Economics
ABUS 201 PC Applications
MRKT 351 Principles of Marketing
COMM 236 Writing for Broadcasting and Electronic Media or
COMM 256 Writing for Broadcasting and Electronic Media or
ENGL 241 News Writing or
ENGL 243 Magazine Writing or
ENGL 343 Persuasive Writing or
ENGL 347 Advanced Writing
Senior Capstone Experience

II. Concentration Electives (12 hrs)
Choose two courses:
COMM 121 Argumentation
COMM 130 Intro. to Public Relations
COMM 150 Intro. to Broadcasting and Electronic Media
COMM 230 Communication Theory
COMM 240 Parliamentary Procedure
COMM 330 Publ., Media and Campaigns
COMM 340 Voice and Diction
COMM 348 Health Communication
COMM 421 Political Communication
Choose one course:
- ABUS 312 Business Law 1
- MGMT 363 Human Resource Mgmt.
- MRKT 452 Consumer Behavior
- ABUS 395 Multimedia Design and Dev.

Professional and Organizational Communication Minor (34 hours)

I. Minor Requirements (26 hours)
- COMM 211 Public Speaking
- COMM 212 Business and Prof. Speaking
- COMM 225 Interpersonal Communication
- COMM 311 Persuasive Speaking
- COMM 345 Organizational Communication
- COMM 440 Comm. and Conflict Mgmt.
- COMM 445 Issues in Prof. Communication

II. Minor Electives (8 hours)
Choose two courses:
- COMM 121 Argumentation
- COMM 130 Intro. to Public Relations
- COMM 150 Intro. to Broadcasting and Electronic Media
- COMM 221 Interviewing
- COMM 230 Communication Theory
- COMM 240 Parliamentary Procedure
- COMM 321 Group Communication
- COMM 330 Publ., Media and Campaigns
- COMM 348 Health Communication

Communication Arts with Theatre Concentration (74 hours)

I. Concentration Requirements: (54 hours)
- COMM 106 Introduction to Theatre
- COMM 241 Oral Interpretation of Literature
- COMM 260 Acting
- COMM 275 Theatre Technology
- COMM 285 Stage Management
- COMM 291 World Theatre History
- COMM 300 Theatre Symposium
- COMM 340 Voice and Diction
- COMM 370 Dance History
- COMM 375 Topics in Theatre Design
- COMM 380 Arts Administration
- COMM 385 Production Analysis
- COMM 386 Directing
- COMM 391 American Theatre History
- COMM 499 Independent Study (Sr. Capstone)

II. Concentration Electives (24 hours)
Choose four courses:
- COMM 211 Public Speaking***
- ART 222 Graphic Design
- ENGL 241 News Writing
- ENGL 243 Magazine Writing
- COMM 256 Writing for Broadcasting and Electronic Media
- COMM 321 Group Communication
- COMM 355 Broadcast Journalism
- Comm 378 Design Practicum
- COMM 387 Directing Practicum

III. Concentration Cognates: (12 hours)
- ENGL 208 Modern World Drama
- ENGL 260 Introduction to Shakespeare
- PHIL 341 Aesthetics

Theatre Minor (28 hours)

- COMM 106 Intro. to Theatre
- COMM 260 Acting
- COMM 275 Theatre Tech.
- COMM 291 World Theatre History
- COMM 385 Production Analysis
- COMM 386 Directing
- Plus 4 hrs. of theatre electives other than practicum.

Communication Arts with Public Relations Concentration (62 hrs.)

I. Concentration Requirements (38 hrs.)
- COMM 130 Introduction to Public Relations
- COMM 203 Public Relations Practicum*
- COMM 236 Public Relations Writing
- TECH 240 Introduction to Communication Technology
- COMM 330 Publicity, Media & Campaigns
- COMM 335 Internship**
- COMM 336 Advanced Public Relations Writing
- COMM 342 Public Relations Research
- COMM 430 Public Relations Case Studies
- Senior Capstone Experience

II. Concentration Electives (24 hours)
Choose four courses:
- COMM 211 Public Speaking***
- COMM 225 Interpersonal Communication***
- ART 222 Graphic Design
- ENGL 241 News Writing
- ENGL 243 Magazine Writing
- COMM 256 Writing for Broadcasting and Electronic Media
- COMM 321 Group Communication
- COMM 355 Broadcast Journalism

Choose two courses:
- COMM 150 Intro. to Broadcasting and Electronic Media
- COMM 212 Business and Prof. Speaking
- COMM 221 Interviewing
- MRKT 351 Principles of Marketing
- MGMT 363 Human Resource Management
- MGMT 410 Business and Society****

**Four hours minimum-sixteen hour maximum; Minimum 2.5 GPA required overall and in concentration requirements
*Six hours minimum-twelve hours maximum
***Whichever was not taken to meet general education requirements
****May be repeated with different topics

Public Relations Minor (28 hours)

COMM 130 Intro. to Public Relations
COMM 236 Public Relations Writing
TECH 240 Intro. to Comm. Technology
COMM 330 Publ., Media and Campaigns
COMM 336 Adv. Public Relations Writing
COMM 342 Public Relations Research
COMM 430 Public Relations Case Studies

Communication Arts with Broadcasting and Electronic Media Concentration (49 hours)

I. Concentration Requirements (29 hours)

COMM 150 Intro. to Broadcasting and Electronic Media
COMM 256 Writing for Broadcasting and Electronic Media
COMM 258 Broadcasting and Electronic Media Practicum: Audio (4 hrs.)
COMM 259 Broadcasting and Electronic Media Practicum: Video (4 hrs.)
COMM 335 Internship (4 hrs.)
COMM 351 Audio/Video Production
COMM 453 Mass Media & Society
COMM 457 Senior Capstone Experience (1 hr)

II. Concentration Electives (20 hours)
Choose three courses:
COMM 355 Broadcast Journalism
COMM 452 Broadcast Sales and Promotions
COMM 454 Corporate Audio and Video Production
COMM 455 Broadcasting and Electronic Media Management
ENGL 371 Journalism
ABUS 395 Multimedia Design and Development

Choose two courses:
COMM 130 Introduction to Public Relations
COMM 211 Public Speaking*
or
COMM 225 Interpersonal Communication*
COMM 221 Interpersonal Communication*
COMM 260 Acting
COMM 340 Voice and Diction
MRKT 351 Principles of Marketing

*Whichever was not taken to meet general education requirement

Broadcasting and Electronic Media Minor (28 hrs.)

COMM 150 Intro. to Broadcasting and Electronic Media
COMM 256 Writing for Broadcasting and Electronic Media

COMM 258 B and EM Practicum: Audio (2 hrs.)
COMM 259 B and EM Practicum: Video (2 hrs.)
COMM 355 Broadcast Journalism
COMM 452 Broadcast Sales and Promotions
COMM 453 Mass Media & Society
COMM 455 Broadcasting and Electronic Media Management

Communication Arts with Musical Theatre Concentration (87 hours)

I. Concentration Requirements (50 hours)

Theatre

COMM 106 Introduction to Theatre
COMM 260 Acting
COMM 261 Performance Practicum
or
COMM 265 Musical Theatre Practicum
COMM 275 Theatre Technology
COMM 278 Makeup
COMM 291 World Theatre History
COMM 300 Theatre Symposium
COMM 360 Topics in Acting
COMM 370 Dance History
or
COMM 460 Styles of Acting
COMM 465 Adv. Musical Th. Performance
COMM 499 Independent Study: Sr. Capstone

Music (21 hours)

AMUS 015 Individual Voice
AMUS 020 Piano Class
or
AMUS 025 Individual Piano
AMUS 089 Opera Workshop
MUSC 100 Music Appreciation
MUSC 121 and 131 Theory of Music and Ear Training

Dance (14 hours)
(chosen from the following with at least one course in each area)

COMM 115 Tap Dance 1
COMM 116 Jazz Dance 1
COMM 117 Modern Dance 1
COMM 118 Ballet 1
COMM 215 Tap Dance 2
COMM 216 Jazz Dance 2
COMM 217 Modern Dance 2
COMM 218 Ballet 2

II. Concentration Cognate Requirements (2 hours)

AHPE 050 Social Dance
AHPE 080 Square and Folk Dancing

Communication Arts/Dance Minor (29 hrs.)
The dance minor, which is available to majors and non-majors throughout the university, has a strong technical component. Students pursuing a dance minor must choose a technical area of emphasis in either ballet or modern dance.
### Ballet Emphasis

- **COMM 117** Ballet 1
- **COMM 118** Modern Dance 1
- **COMM 204** Dance Practicum
- **COMM 217** Ballet 2**
- **COMM 380** Dance History**
- **COMM 470** Dance Composition**

### Modern Dance Emphasis

- **COMM 117** Ballet 1
- **COMM 118** Modern Dance 1
- **COMM 204** Dance Practicum
- **COMM 218** Modern Dance 2
- **COMM 380** Dance History**
- **COMM 470** Dance Composition**

**To be offered on alternate years.**

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### Subject - Communication Arts (COMM)

#### 000 - ORIENTATION
1.00 Credit
Familiarization with the departmental requirements for majors, planning a program of courses, university catalog and library. Required of departmental majors. Graded S/U.

#### 105 - THEATRE APPRECIATION
4.00 Credits
An introduction to theatre through the study of its origin and development, and its contemporary theory and practice. For the non-major. Two hours of lecture per week, along with play attendance and production experience. A terminal course which will not answer any Communication Arts major sequence. May not be taken after a successful enrollment in COMM 106. (Discipline: Theatre)

#### 106 - INTRODUCTION TO THEATRE
4.00 Credits
Introduction to dramatic structures and genres, production styles, and the roles of artists within the theatre. Overview of the history of theatre’s place in society through the examination of selected dramatic texts. Enrollment limited to students in the theatre and musical theatre concentrations. (Discipline: Theatre)

#### 110 - PUBLICATION ACTIVITIES PRACTICUM
1.00 Credit
Participation in design, photography, writing, and producing the Ohio Northern yearbook. May be repeated, but only 12 hours will count toward graduation. Graded S/U.

#### 115 - TAP DANCE 1
2.00 Credits
Tap dancing, taught in a studio format. The course is designed for the student with little or no experience in tap dancing. May be repeated, but only 8 credit hours will count toward graduation. (Discipline: Theatre)

#### 116 - JAZZ DANCE 1
2.00 Credits
Jazz dancing for the musical theatre taught in a studio format. The course is designed for the student with little or no experience in jazz dancing. May be repeated, but only 8 credit hours will count toward graduation. (Discipline: Theatre)

#### 117 - BALLET 1
2.00 Credits
Ballet dancing taught in a studio format. The course is designed for the student with little or no experience in ballet dancing. May be repeated, but only 8 credit hours will count toward graduation. (Discipline: Theatre)

#### 118 - MODERN DANCE 1
2.00 Credits
Modern dance taught in the studio format. The course is designed for the student with little or no experience in modern dance. May be repeated, but only 8 credit hours graduation. (Discipline: Theatre)

#### 121 - ARGUMENTATION
4.00 Credits
Basic skills in critical thinking by applying elementary debate theory through oral and written activities. (Discipline: Prof. & Org. Comm.)

#### 130 - INTRODUCTION TO PUBLIC RELATIONS
4.00 Credits
The role, function, and responsibilities of the public relations practitioner within organizations. (Discipline: Public Relations)

#### 150 – INTRODUCTION TO BROADCASTING AND ELECTRONIC MEDIA
4.00 Credits
A survey course that examines various aspects of broadcasting, cable, and the emerging electronic media. (Discipline: Brdcsting. & Elec. Media)

#### 190 - SPECIAL TOPICS IN COMMUNICATION ARTS
1.00 to 4.00 Credits
Course may be repeated as topics vary, but only 12 hours will count toward graduation.
203 - PUBLIC RELATIONS PRACTICUM
1.00 to 4.00 Credits
Course provides students the opportunity to experience public relations firsthand through professional involvement with service and non-profit projects. A repeatable course. For non-majors, only 12 hours apply toward graduation. (Discipline: Public Relations)

204 - DANCE PRACTICUM
1.00 to 4.00 Credits
Participation in a collaborative laboratory experience. Open only to students who have auditioned and been awarded roles in Ohio Northern University Dance Company or dance productions. A repeatable course. For non-majors, only 6 hours apply toward graduation. Prerequisite: Permission of the instructor. (Discipline: Theatre)

211 - PUBLIC SPEAKING
4.00 Credits
(Formerly Speech Communication 100) Basic principles of preparation and delivery of original informative and persuasive speeches. (Discipline: Prof. & Org. Comm.)

212 - BUSINESS AND PROFESSIONAL SPEAKING
4.00 Credits
A course to assist the student in acquiring the knowledge and skills especially pertinent to meeting the speech communication tasks of a business or professional person. Prerequisite: COMM 211. (Discipline: Prof. & Org. Comm.)

215 - TAP DANCE 2
2.00 Credits
A studio tap dance class for the intermediate and advanced student. Course may be repeated, but only 8 credit hours will count toward graduation. Permission of the instructor is required for admission. (Discipline: Theatre)

216 - JAZZ DANCE 2
2.00 Credits
A studio jazz dance class for the intermediate and advanced student. Course may be repeated, but only 8 credit hours will count toward graduation. Permission of the instructor is required for admission. (Discipline: Theatre)

217 - BALLET 2
2.00 Credits
A studio ballet class for the intermediate and advanced student. At the discretion of the instructor, the class may include pointe work and partnering work for students with strong technique. Course may be repeated, but only 8 credit hours will count toward graduation. Permission of the instructor is required for admission. (Discipline: Theatre)

218 - MODERN DANCE 2
2.00 Credits
A modern dance studio class for the intermediate and advanced student. Course may be repeated, but only 8 credit hours will count toward graduation. Permission of the instructor is required for admission. (Discipline: Theatre)

221 - INTERVIEWING
4.00 Credits
The basic principles and structures of interviewing are examined and applied to interview situations such as employment, performance/appraisal, journalism, etc. (Discipline: Prof. & Org. Comm.)

225 - INTERPERSONAL COMMUNICATION
4.00 Credits
Course explores a range of theories and issues that will help students improve their ability to communicate effectively in a variety of interpersonal relationships. (Discipline: Prof. & Org. Comm.)

230 - COMMUNICATION THEORY
4.00 Credits
The course is designed to provide a framework of knowledge about the theories, nature, and dynamics of human communication/interaction. Prerequisite: COMM 211 or 225. (Discipline: Prof. & Org. Comm.)

236 - PUBLIC RELATIONS WRITING
4.00 Credits
Study of basic concepts for public relations writing projects and production of written public relations materials. Use of the computers for word-processing and page layout programs are also included. The course consists of lectures, discussions, and supervised writing labs. Prerequisite: COMM 130. (Discipline: Public Relations)

240 - PARLIAMENTARY PROCEDURE
4.00 Credits
Methods of conducting formal meetings by parliamentary rules. (Discipline: Prof. & Org. Comm.)

241 - ORAL INTERPRETATION OF LITERATURE
4.00 Credits
Analyzing prose, poetry, and dramatic literature for individual and group presentations in class. (Discipline: Prof. & Org. Comm. and Theatre)
256 – WRITING FOR BROADCASTING AND ELECTRONIC MEDIA
4.00 Credits
A study of the principles and techniques of copywriting for radio and television, corporate audio/video productions and the electronic media. (Discipline: Brdcstg. & Elec. Media)

257 - BROADCASTING AND ELECTRONIC MEDIA PRACTICUM
1.00 to 4.00 Credits
Production practicum utilizing the facilities of WONB Radio or ONU Cable. Primarily for non-majors with an interest in working with the campus radio station or campus cable system. Majors with limited skills in production are welcome to take the course as well. A repeatable course. For non-majors, only 12 hours apply toward graduation. Prerequisite: Permission of instructor. (Formerly COMM 252) (Discipline: Brdcstg. & Elec. Media)

258 - BROADCASTING AND ELECTRONIC MEDIA PRACTICUM: AUDIO
1.00 to 4.00 Credits
Production practicum utilizing the facilities of WONB Radio. Majors are required to complete four hours of the course for graduation. Final grade in course is production driven. Highly skilled non-majors are welcome to take the course, but only 12 hours apply toward graduation. Prerequisite: Permission of instructor. (Discipline: Brdcstg. & Elec. Media)

259 - BROADCASTING AND ELECTRONIC MEDIA PRACTICUM: VIDEO
1.00 to 4.00 Credits
Production practicum utilizing the facilities of ONU Cable. Majors are required to complete four hours of the course for graduation. Final grade in this course is production driven. A repeatable course. For non-majors, only 12 hours apply toward graduation. Prerequisite: Permission of instructor. (Discipline: Brdcstg. & Elec. Media)

260 - ACTING
4.00 Credits
A studio class designed to introduce and develop fundamental acting skills through readings, discussions, exercises, monologues, and scenes. Course may be repeated, but only 8 credit hours will count toward graduation. (Discipline: Theatre)

261 - PERFORMANCE PRACTICUM
1.00 to 4.00 Credits
Participation in a collaborative laboratory experience. Open only to students who have auditioned for and have been awarded roles in University mainstage or studio theatre productions. A repeatable course. For non-majors, only 6 hours apply toward graduation. Prerequisite: Permission of the instructor. (Discipline: Theatre)

265 - MUSICAL THEATRE PERFORMANCE STUDIES
4.00 Credits
Performance techniques for musical theatre. Students will also prepare and present scenes and songs from musicals. Course may be repeated, but only 8 credit hours will count toward graduation. (Discipline: Theatre)

275 - THEATRE TECHNOLOGY
4.00 Credits
Theoretical and practical work in the fundamentals of technical theatre production. Content includes scenic construction, property construction, theatrical sound, basic drafting, and basic design theory. Required lab work. (Discipline: Theatre)

276 - PRODUCTION PRACTICUM
1.00 to 4.00 Credits
Participation in a collaborative laboratory experience which involves serving on a crew for a University mainstage or studio production. A repeatable course. For non-majors, only 6 hours apply toward graduation. Prerequisite: Permission of the instructor. (Discipline: Theatre)

277 - SHOP PRACTICUM
1.00 to 4.00 Credits
Participation in a collaborative laboratory experience working in the scene or costume shop for University productions. A repeatable course. For non-majors, only 6 hours apply toward graduation. Prerequisite: Permission of the instructor. (Discipline: Theatre)

278 - MAKEUP
2.00 Credits
Methods and practice in the creation and application of stage makeup. Students may comprise makeup crews for University Theatre and Studio Theatre productions. (Discipline: Theatre)

283 - STAGE MANAGEMENT PRACTICUM
1.00 to 4.00 Credits
Participation in a collaborative laboratory experience as a stage manager or assistant stage manager for a University mainstage or studio production. A repeatable course. For non-majors, only 6 hours apply toward graduation. Prerequisite: Permission of the instructor. (Discipline: Theatre)
285 - STAGE MANAGEMENT
2.00 Credits
Principles and practices of stage management and logistical organization of commercial and noncommercial theatre. Content includes scheduling, pre-production planning, auditions, rehearsals, performance procedures, budgeting, and company organization and structure. (Discipline: Theatre)

290 - SPECIAL TOPICS IN COMMUNICATION ARTS
1.00 to 4.00 Credits
Course may be repeated as topics vary, but only 12 hours will count toward graduation.

291 - WORLD THEATRE HISTORY
4.00 Credits
A survey of the history and social impact of the theatre in Western and non-Western cultures from ancient times to the present. (Discipline: Theatre)

300 - THEATRE SYMPOSIUM
1.00 Credit
Workshop with visiting theatre professionals which may include stage directors, designers, choreographers, and professional performers. Course may be repeated as topics vary but only 4 hours apply toward graduation. Graded S/U. Prerequisite: Permission of the instructor. (Discipline: Theatre)

311 - PERSUASIVE SPEAKING
4.00 Credits
(Formerly Advanced Public Address). An advanced public speaking course with an emphasis on persuasive theory and techniques. Prerequisite: COMM 211. (Discipline: Prof. & Org. Comm.)

321 - GROUP COMMUNICATION
4.00 Credits
Group theory and problem solving methods are examined; course focuses on the process of analyzing problems to implementing solutions. Prerequisite: COMM 211. (Discipline: Prof. & Org. Comm.)

330 - PUBLICITY, MEDIA, AND CAMPAIGNS
4.00 Credits
A course analyzing techniques for motivating target audiences along with practical analysis and preparation of communication materials to elicit reactions or support from specialized groups. Prerequisite: COMM 130. (Discipline: Public Relations)

335 - INTERNSHIP
1.00 to 16.00 Credits
A skills course designed to blend classroom theory with practical experience through working in an outside organization. Approval of department required prior to registration for course. Course may be repeated, but only 16 credit hours will count toward graduation. (Discipline: Public Relations and Brdcstg. & Elec. Media)

336 - ADVANCED PUBLIC RELATIONS WRITING
4.00 Credits
This course presents opportunities for researching, identifying and writing public affairs columns, editorials, features, and position papers for use in the public relations arena. Prerequisites: COMM 130 and 236. (Discipline: Public Relations)

340 - VOICE AND DICTION
4.00 Credits
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. (Disciplines: Prof. & Org. Comm. and Theatre)

342 - PUBLIC RELATIONS RESEARCH FOR PLANNING AND EVALUATION
4.00 Credits
The planning and evaluation process of public relations. The difference between public relations research and social science research methods. Prerequisite: COMM 130. (Discipline: Public Relations)

345 - ORGANIZATIONAL COMMUNICATION
4.00 Credits
Major organization and communication theories and their practical applications for effective communication within organizations and the professions. Examines communication processes, various roles and relationships in organizations, leadership communication, ethics, and problematic communication situations. Offered alternate years. (Discipline: Prof. & Org. Comm.)

348 - HEALTH COMMUNICATION
4.00 Credits
Theory and practice of health communication. Examines communication between practitioner/client, in community/consumer health education, in health teams and groups, in health care delivery systems, in support systems for the elderly, disabled, terminally ill, in intercultural settings. Offered alternate years. (Discipline: Prof. & Org. Comm.)
351 - AUDIO/VIDEO PRODUCTION
4.00 Credits
Principles and techniques of audio and video production. Course will include lab times utilizing the facilities of WONB Radio and ONU Cable Television. Prerequisite: COMM 256. (Discipline: Brdcstg. & Elec. Media)

355 - BROADCAST JOURNALISM
4.00 Credits
Principles of news gathering and reporting primarily for television and radio. Subjective and objective analysis of news, its presentation, and its effects. Practical assignments emphasized. Prerequisite: COMM 150. (Discipline: Brdcstg. & Elec. Media)

360 - TOPICS IN ACTING
4.00 Credits
A course which focuses on a specific topic each time it is offered. Topics may include improvisation, stage combat, stage dialects and acting for the camera. Course may be repeated as topics vary but only 12 hours apply toward graduation. (Discipline: Theatre)

370 - DANCE HISTORY
4.00 Credits
Evolution of dance through the ages. Ethnic dance styles and dance as a performance art will be studied. Some reconstruction of cultural and historical dance will be included in the coursework. (Discipline: Theatre)

375 - TOPICS IN THEATRE DESIGN
4.00 Credits
The basic design elements of theatre including, but not limited to: Scenic, Lighting, Costume, Sound, Props and Advanced Technology. Only one design area is offered each year. May be repeated, but only 16 credit hours will count toward graduation. Prerequisite: COMM 275. (Discipline: Theatre)

378 - DESIGN PRACTICUM
1.00 to 4.00 Credits
Participation in a collaborative laboratory experience which focuses on the design, supervision, and execution of lights, sets, costumes, sound or props for a University mainstage or studio production. The student is assigned a departmental advisor for the project. A repeatable course. For non-majors, only 6 hours apply toward graduation. Prerequisite: COMM 375 and permission of the instructor. (Discipline: Theatre)

380 - ARTS ADMINISTRATION
4.00 Credits
A survey course that examines the management of non-profit arts organizations. Content includes study in planning, programming, marketing and fundraising. Prerequisite: COMM 106 or COMM 130 or ART 100. (Discipline: Theatre)

385 - PRODUCTION ANALYSIS
4.00 Credits
The techniques for the interpreting and staging of dramatic literature by the producer, director, and designers. Content includes the basic concepts of interpretation, theme, style, play analysis, and staging. (Discipline: Theatre)

386 - DIRECTING
4.00 Credits
Methods, theories, exercises, and practices in directing and presenting dramatic scenes. Prerequisite: 4 hours of acting and permission of the instructor. (Discipline: Theatre)

387 - DIRECTING PRACTICUM
1.00 to 4.00 Credits
Participation in a collaborative laboratory experience which focuses on directing a University mainstage or studio production. The student is assigned a departmental advisor for the project. A repeatable course. For non-majors, only 6 hours apply toward graduation. Prerequisite: COMM 386 and permission of the instructor. (Discipline: Theatre)

390 - SPECIAL TOPICS IN COMMUNICATION ARTS
1.00 to 4.00 Credits
May be repeated as topics vary, but only 12 hours will count toward graduation.

391 - AMERICAN THEATRE HISTORY
4.00 Credits
An historical survey of American theatre and popular entertainment forms from the colonial period through the rise of realism and contemporary theatre. (Discipline: Theatre)

421 - POLITICAL COMMUNICATION
4.00 Credits
Political communication and the means to assess political activities through rhetorical methods of analysis. Methods may include those presented by classical and contemporary theorists, such as Aristotle, Lloyd Bitzer, and Kenneth Burke. (Discipline: Prof. & Org. Comm.)
430 - PUBLIC RELATIONS CASE STUDIES
4.00 Credits
Public relations case studies concerning problems in industry, business, education, government, social welfare, and trade associations. Prerequisite: COMM 130. (Discipline: Public Relations)

440 - COMMUNICATION AND CONFLICT MANAGEMENT
4.00 Credits
The central role of communication in the creation and management of conflict, as well as communication skills and strategies for managing conflict effectively, with an emphasis on collaborative problem solving. Offered alternate years. Prerequisite: Sophomore standing. (Discipline: Prof. & Org. Comm.)

445 - ISSUES IN PROFESSIONAL COMMUNICATION
4.00 Credits
Issues in communication relative to entry into the professional and organizational sector. The role of communication in such issues as affirmative action, harassment, gender equity, sexual orientation, workplace environment, labor relations, multiculturalism, and use of new communication technologies. Offered alternate years. Prerequisite: COMM 345. (Discipline: Prof. & Org. Comm.)

452 - BROADCAST SALES AND PROMOTIONS
4.00 Credits
Skills involved in selling broadcast time and station promotion. (Discipline: Brdcstg. & Elec. Media)

453 - MASS MEDIA AND SOCIETY
4.00 Credits
The legal, ethical, and social responsibilities of journalists and other mass communicators. Prerequisite: COMM 150. (Discipline: Brdcstg. & Elec. Media)

454 - CORPORATE VIDEO PRODUCTION
4.00 Credits
Video production course reviewing the needs of the corporate, non-broadcast, industry. Will cover planning, scripting and production of short and long form corporate videos. (Discipline: Brdcstg. & Elec. Media)

455 - BROADCASTING AND ELECTRONIC MEDIA MANAGEMENT
4.00 Credits
Sales, programming, marketing, and management techniques unique to the broadcast medium. Prerequisite: COMM 150. (Discipline: Brdcstg. & Elec. Media)

457 - BEM PRACTICUM: SENIOR CAPSTONE
1.00 to 4.00 Credits
A production/performance based course which serves as the senior capstone for the Broadcasting and Electronic Media concentration. Prerequisite: Permission of instructor and senior status. (Discipline: Brdcstg. & Elec. Media)

460 - STYLES OF ACTING
4.00 Credits
Improvement of acting techniques and preparation for creating characterizations from the classical theatre repertoire including Shakespearean Tragedy and Comedy, Moliere’s Comedy, Restoration Comedy of Manners, and Farce. Course may be repeated but only 8 credit hours will count toward graduation. Prerequisite: COMM 260. (Discipline: Theatre)

465 - ADVANCED MUSICAL THEATRE PERFORMANCE
4.00 Credits
Choosing audition material and performing scenes and songs from the traditional and contemporary styles of musical theatre. Enrollment limited to students accepted into the musical theatre concentration. Prerequisite: COMM 265. (Discipline: Theatre)

470 - DANCE COMPOSITION
4.00 Credits
Principles general to all choreographic compositional styles and application of these principles through weekly choreographic compositional projects. There will also be inclass performances. (Discipline: Theatre)

480 - ARTS IN THE COMMUNITY
4.00 Credits
Theory and practice of education programs in the non-profit arts organization. Examines the application of multi-disciplinary teaching methods in outreach programs; long-range planning; and design and evaluation of lesson plans, activities and materials for events or exhibits. Prerequisite: COMM 380. (Discipline: Theatre)

486 - PLAYWRITING
2.00 Credits
The principles of writing plays by examining the process for selecting and arranging dramatic material for an artistic purpose. (Discipline: Theatre)

490 - SPECIAL TOPICS IN COMMUNICATION ARTS
1.00 to 4.00 Credits
May be repeated as topics vary, but only 12 hours will count toward graduation.

499 - INDEPENDENT STUDY IN COMMUNICATION ARTS
1.00 to 4.00 Credits
Prerequisite: Permission of department.
DEPARTMENT OF COMPUTER SCIENCE

Professor Hovis; Associate Professors Hudak (Chair), Retterer; Assistant Professor Bitterman

Mission Statement

The mission of the department of Computer Science at Ohio Northern University is to prepare students for professional and productive lives as members of the computing community. Toward that end, we set the following goals:

1. To provide students with the formal education that serves as the foundation on which practical knowledge and skills are built.
2. To develop the design skills of students through problem solving and laboratory activities.
3. To participate in the rapid growth of Computer Science through the deployment of current computing technology and the integration of research and emerging technologies in our curriculum.
4. To view the practice of Computer Science within technical, societal, political, ergonomic and ethical perspectives.

Department Overview

The department offers a major in computer science as well as a minor in computer science. Courses are offered in computer science to complement many disciplines in the university. Students with a primary major in the department may choose a general education program leading to either the bachelor of arts degree or the bachelor of science degree. The department maintains a student chapter of the Association for Computing Machinery, a national organization for computing professionals and a chapter of the Upsilon Pi Epsilon, the national Computer Science honorary.

The Mary Reichelderfer Chair in Mathematics and Computer Science was established in 1983 from funds of the estate of Mary K. Werkman. The chair is jointly shared between the Departments of Computer Science and Mathematics. The 1999-2000 recipient of this chair is Danhong Song, associate professor of mathematics.

Students who want an introduction to computing should take either CS 130, Introduction to Information Systems, or CS 141, Introduction to the World Wide Web. Students desiring an introduction to programming should take CS 164, Programming I. For a greater exposure to programming, the sequence 164-165-166 should be taken.

All courses in computer science that are to be counted toward a major or minor in computer science must be completed with a grade of "C" or better.

Co-op Program

Computer science majors seeking a Co-op must enroll in CS 350 (1 hour). At least sophomore status is required for application for admission into a co-op program. Participation requires junior or senior status. Participants must agree to:

- Register for at least 12 hours of course work each term on campus.
- Register for CS 350 for each term at the co-op site.
- Maintain an overall grade point average of at least 2.5.
- Submit a co-op practicum report to the departmental co-op director during the ninth week of each work term.
- Allow release of academic record to co-op employer and prospective employers and to allow the co-op employer to release their employment record to Ohio Northern University.
- Arrange to meet all deadlines for completion of paperwork normally associated with attendance at Ohio Northern University (e.g., advance registration, grants and loans, etc.).

Certification of completion of the program will appear as a concentration on the transcript. No other courses can be taken while on a co-op experience. Participation in intercollegiate athletic teams is prohibited while on a co-op experience. A minimum of three quarters of work is required for completion of the co-op experience—a maximum of six quarters of work is allowed. Most co-ops will be expected to do six quarters of work. Acceptance into the program is not guaranteed. Once the experience is begun, it can be terminated by the participant, the department, the university, or the employer for any reason. Co-op employers must meet the requirements of the department and the university. Complete details of the co-op program are available in the department office.

Major and Minor Requirements

For the computer science major, the student must complete the following courses:

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<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>CS 164</td>
<td>Programming 1</td>
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<td>CS 165</td>
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<td>CS 166</td>
<td>Programming 3</td>
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<td>CS 228</td>
<td>Programming Environments</td>
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<td>CS 264</td>
<td>Assembly Language and Computer Organization</td>
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<td>CS 268</td>
<td>Data Structures</td>
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<td>CS 330</td>
<td>Organization of Programming Languages</td>
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<td>CS 365</td>
<td>Computer Architecture</td>
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<td>CS 429</td>
<td>Senior Project Definition</td>
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<tr>
<td>CS 440</td>
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<tr>
<td>CS 448</td>
<td>Foundations of Computing</td>
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<td>CS 464</td>
<td>Software Engineering</td>
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<tr>
<td>CS 466</td>
<td>Operating Systems</td>
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<tr>
<td>CS 468</td>
<td>Compilers</td>
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In addition, the computer science major is required to complete three courses (each 4 credit hours or more) in computer science electives with at least two at the 300/400 level. CS 470 (Internship) cannot count as any more than one four-hour elective. The computer science major must also complete these cognates: MATH 163, 164, 272, 336, and 380; ECE 361.

For the computer science minor, the student must complete CS 164, 165, and 166 followed by at least four additional courses (four credit hours or more) in computer science with at least two at the 300/400 level.
Subject - Computer Science (CS) —

000 - ORIENTATION
1.00 Credit
Familiarization with the department, requirements for majors, planning programs of study, University catalog and library. Graded S/U.

130 - INTRODUCTION TO INFORMATION SYSTEMS
4.00 Credits
The language, technology, techniques, applications, and management of information systems. The course includes a laboratory component dealing with such issues as operating systems, word processing, spreadsheet and databases.

133 - PROGRAMMING IN VISUAL BASIC
4.00 Credits
Simple event-driven programming using the Visual Basic language. Simple data types, expressions, conditionals and iteration. Does not count toward Computer Science major.

141 - INTRODUCTION TO THE WORLD WIDE WEB
4.00 Credits
The languages, technologies, techniques and applications of the World Wide Web. A hands-on laboratory component including both web navigation and content design.

164 - PROGRAMMING 1
4.00 Credits
Basic programming techniques; simple data types, expressions, functions, conditionals, iteration, recursion, structures, data types, etc. The use of high-level programming languages with a focus on simple algorithm development. (Formerly CS 134) (Also listed as ECE 164)

165 - PROGRAMMING 2
4.00 Credits
Advanced programming topics: memory management, object-oriented programming, algorithm analysis, etc. Principles of software engineering with illustrations based on examples from central areas of computing science. Prerequisite: CS 164. (Formerly CS 135) (Also listed as ECE 165)

166 - PROGRAMMING 3
4.00 Credits
Continuation of topics from Programming 2 (CS 165). System Life Cycle, library construction, recursion, abstract data types (stacks, queues, trees), searching and sorting. Prerequisite: CS 165. (Formerly CS 136) (Also listed as ECE 166)

191 - SPECIAL TOPICS IN COMPUTER SCIENCE
1.00 to 4.00 Credits

228 - PROGRAMMING ENVIRONMENTS
4.00 Credits
Study and use of software development environments with integrated compiler, linker, debugger, editor, browser and project management. Development of an application with a graphical user interface (GUI). Additional study of object-oriented programming, inheritance and polymorphism. Prerequisite: CS 166. (Formerly CS 138)

231 - INTRODUCTION TO COBOL
4.00 Credits
An introduction to programming in COBOL with business applications. Offered alternate years.

241 - WEB-ENABLED PROGRAMMING
4.00 Credits
The World Wide Web as a programming platform. Issues, tools and applications related to distributed computing will be covered. Prerequisite: CS 166. Offered alternate years.

264 - ASSEMBLY LANGUAGE AND COMPUTER ORGANIZATION
4.00 Credits
Computer structure and machine language, assembly language programming, macros, program segmentation and linkage. Prerequisite: CS 166. (Formerly CS 234) (Also listed as ECE 264)

268 - DATA STRUCTURES
4.00 Credits
Emphasis on data abstraction as a primary tool in software construction. Use of modern programming language abstraction features to implement classical data structures: linear structures (lists, stacks, queues), tree structures (BTrees, AVLTrees, Splay Trees), hash tables and graphs. Introduction to space and time complexity analysis. Prerequisites: CS 166 and MATH 336. (Formerly CS 338 and 248) (Also listed as ECE 268)

291 - SPECIAL TOPICS IN COMPUTER SCIENCE
1.00 to 4.00 Credits

330 - ORGANIZATION OF PROGRAMMING LANGUAGES
4.00 Credits
Theoretical investigation of programming language constructs; illustration of construct implementation in popular programming languages. Offered alternate years. Prerequisite: CS 264.

332 - OPERATIONS RESEARCH
4.00 Credits
Optimal decision making in deterministic systems; linear programming model, simplex method and algorithms, primal and dual problem, sensitivity analysis, transportation and transshipment, assignment, shortest route, minimal spanning tree, maximal flow, PERT, game theory, and nonlinear programming. Prerequisite: MATH 272. (Also listed as MATH 332.)

341 - ARTIFICIAL INTELLIGENCE
4.00 Credits
Artificial intelligence problems and techniques for their solution. Includes use of LISP, search algorithms, knowledge representation, expert systems, parsing language and language comprehension, learning. Offered alternate years. Prerequisite: Knowledge equivalent of 2 quarters of a programming language or consent of instructor. Offered alternate years.

COMPUTER SCIENCE 89
348 - DATABASES
4.00 Credits
Overview, models and applications of database systems, including the relational data model. Prerequisite: CS 164 or 231. Offered alternate years.

350 - PROFESSIONAL PRACTICE
1.00 Credit
Cooperative education at an off-campus site. Involvement in full-time work (40 hours per week or more) requiring knowledge and skills in the major. See description of co-op program in department's catalog narrative for details. Prerequisites: Junior status; 2.5 GPA; and acceptance into the Co-op program. Graded S/U.

365 - COMPUTER ARCHITECTURE
4.00 Credits
Aspects of computer hardware; computer arithmetic, microarchitecture design (both datapath and control unit), instruction sets, storage hierarchies. Introduction to system organization. Current families of micro-processors illustrating design tradeoffs. Prerequisites: CS 264 and ECE 361. (Formerly CS 236 and 336.) (Also listed as ECE 365)

366 - NETWORKS AND DATA COMMUNICATION
4.00 Credits
WAN and LAN design and use. Network software, including the ISO/OSI standard. Network hardware, including the Ethernet and Token Ring network protocols. Prerequisite: CS 365. (Formerly CS 346) (Also listed as ECE 366)

391 - SPECIAL TOPICS IN COMPUTER SCIENCE
1.00 to 4.00 Credits

429 - SENIOR PROJECT DEFINITION
1.00 Credit
An examination of the software life cycle and a discussion of software engineering methodologies. The goal of the course is to produce a problem definition that can be used as the basis for the CS 440 Senior Project course.

440 - SENIOR PROJECT IN COMPUTER SCIENCE
4.00 Credits
An applications project conducted by student teams. Students will be responsible for the definition, design, and implementation of a software project. Students doing an off-campus project will be graded S/U. Prerequisite: CS 464. (Formerly CS 430)

442 - HIGH PERFORMANCE COMPUTING
4.00 Credits
Vector and parallel architecture. System software for high-performance computers; numerical analysis on high-performance computers; parallel algorithms. Prerequisite: CS 365. Offered alternate years.

448 - FOUNDATIONS OF COMPUTING
4.00 Credits
Analysis of algorithms. Computability and complexity theory. The halting problem; P and NP classes of algorithms; NP-completeness. Prerequisite: MATH 336.

461 - NUMERICAL ANALYSIS 1
4.00 Credits
Solution of equations in one variable; interpolation and polynomial approximation; direct methods for solution of linear systems. (Also listed as MATH 461.) Prerequisites: CS 165; MATH 165 and 272. Offered alternate years.

462 - NUMERICAL ANALYSIS 2
3.00 Credits
Numerical differentiation and integration; initial value problems for ordinary differential equations; iterative techniques in matrix algebra. Offered alternate years. Prerequisite: MATH 361. (Also listed as MATH 462)

464 - SOFTWARE ENGINEERING
4.00 Credits
The methodologies used to design, create, evaluate and maintain software systems, including coverage of several modern methodologies with emphasis on one. A project written in a modern software development environment will be developed. Prerequisites: CS 228 or 268. (Formerly CS 434) (Also listed as ECE 464)

466 - OPERATING SYSTEMS
4.00 Credits
Operating system principles; multiprogramming, virtual memory, client-server models for operating systems. Prerequisite: CS 268. (Formerly CS 436) (Also listed as ECE 466)

467 - COMPUTER DEVICE LABORATORY
4.00 Credits
Synchronous and asynchronous bus design. Motherhood implementation issues, clock skew, power dissipation. Device interfacing and device operation. Prerequisite: CS 365.

468 - COMPILERS
4.00 Credits
Scanning; parsing; type checking for strongly typed languages; symbol table generation and maintenance; code generation for simple instruction sets. Prerequisite: CS 464. (Formerly CS 438) (Also listed as ECE 438)

470 - COMPUTER SCIENCE INTERNSHIP
3.00 to 12.00 Credits
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. A maximum of 12 hours is allowed.

491 - SPECIAL TOPICS IN COMPUTER SCIENCE
1.00 to 4.00 Credits

495 - SEMINAR IN COMPUTER SCIENCE
1.00 to 4.00 Credits

498 - INDEPENDENT STUDY IN COMPUTER SCIENCE
1.00 to 4.00 Credits
The professional education unit at Ohio Northern University is the Center for Teacher Education, which is nationally accredited by the National Council of Accreditation of Teacher Education. The center is the single, unified faculty and administrative unit within the University that is primarily responsible for the preparation of teachers. The director of teacher education, as head of the unit, is delegated the authority and responsibility for the overall administration and operation of the professional education unit.

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.

Teaching licenses are issued by the state of Ohio to students who have successfully completed an approved program of teacher preparation and met all requirements prescribed by the State Board of Education. Approved programs and requirements may be obtained in the Center for Teacher Education.

PLEASE NOTE: All general education, curriculum area, professional education, and admission to teacher education programs requirements listed herein are subject to the approval of the State Board of Education.

Students are required to participate in a minimum of 300 hours of supervised field/clinical experience before student teaching. These experiences are included in the required education courses. (Additional information about clinical and field experience is available in the office of the Center for Teacher Education and from professional education advisors.)

Admission to the Teacher Education Program
Specific requirements may be obtained in the office of the Center for Teacher Education. The student is responsible for following the program in a timely manner.

Early Childhood Education preK-3rd grade Licensure
The program is only open to freshmen starting fall of 1998 and beyond.

General education, curriculum area, and professional education requirements may be obtained in the office of the Center for Teacher Education. The courses in general education and curriculum area will meet College of Arts and Sciences and state licensure requirements.

Professional Education Requirements
(• Students must be admitted to the teacher education program.)

EDUC 115 Culture and Schooling, 4 hrs.
EDUC 150 Five-Day Field Experience, 0 hrs. (taken twice)
EDUC 210 Exceptional Learner, 4 hrs.
EDUC 320 Educational Technologies, 4 hrs.
• EDUC 342 Reading in the Content Area, 4 hrs.
• EDUC 445 Organization and Administration of American Schools, 2 hrs.
• EDUC 470 Student Teaching, 15 hrs.
• EDUC 475 Student Teaching Seminar, 1 hr.

Plus:
EDUC 195 Orientation, 1 hr.
EDUC 220 Integrated Fine Arts, 4 hrs.
EDUC 230 Early Childhood Mathematics, 4 hrs.
EDUC 223 Child Development and Psychology, 4 hrs.
EDUC 240 Introduction to Early Childhood Education, 4 hrs.
EDUC 241 Early Childhood Methods and Instruction, 4 hrs.
EDUC 242 Early Childhood Curriculum and Polices, 4 hrs.
• EDUC 310 Integrated Language Arts, 4 hrs.
• EDUC 312 Teaching Phonics, 5 hrs.
• EDUC 314 Foundations of Reading and Assessment, 5 hrs.
• EDUC 340 Diagnosis and Correction of Reading Difficulties, 4 hrs.

Middle Childhood Education 4-9th grades Licensure
This program is only open to freshmen entering the fall of 1998 and beyond.

General education, curriculum area, and professional education requirements may be obtained in the office of the Center for Teacher Education. The courses in general education and curriculum area will meet the College of Arts and Sciences and state approved licensure requirements.
Professional Education Requirements

EDUC 115  Culture and Schooling, 4 hrs.
EDUC 150  Five-Day Field Experience, 0 hrs.  (taken twice)
EDUC 210  Exceptional Learner, 4 hrs.
EDUC 320  Educational Technologies, 4 hrs.
•EDUC 342  Reading in the Content Area, 4 hrs.
•EDUC 445  Organization and Administration of American Schools, 2 hrs.
•EDUC 470  Student Teaching, 15 hrs.
•EDUC 475  Student Teaching Seminar, 1 hr.

Plus:
 EDUC 195  Orientation, 1 hr.
 EDUC 224  Young and Late Adolescent Psychology, 4 hrs.
 EDUC 260  Introduction to Middle Childhood Education, 4 hrs.
 EDUC 261  Middle Childhood Methods and Instruction, 4 hrs.
 EDUC 262  Middle Childhood Curriculum and Polesies, 4 hrs.
•EDUC 312  Teaching Phonics, 5 hrs.
•EDUC 314  Foundations of Reading and Assessments, 5 hrs.
•EDUC 340  Diagnosis and Correction of Reading Difficulties, 4 hrs.

In addition the student must choose two of four content areas to use for concentration areas;

Students may choose between math, reading-language arts, science, or social studies.

They will take the education methods course for that particular middle level and at least 36 hours in the disciplines.

Choices:
 EDUC 308  Middle School Math Methods
 EDUC 309  Middle School Science Methods
 EDUC 310  Integrated Language Arts
 EDUC 311  Middle School Social Studies

A list of discipline courses in the concentration areas is available in the Center of Teacher Education office.

Elementary Education (1-8) Certification
(Only for students who were admitted prior to September, 1998.)

General education, curriculum area, and professional education requirements may be obtained in the office of the Center for Teacher Education. The courses in general education and curriculum area will meet College of Arts and Sciences and state-approved program requirements.

Elementary Education with Reading (K-12) Endorsement: completion of the elementary education program, plus:
 EDUC 340  Diagnosis and Correction of Reading Difficulties, 3 hrs.
 EDUC 341  Advanced Reading Methods and Materials: Clinical Practice in Remedial Reading, 3 hrs.
 EDUC 342  Reading in the Content Area, 4 hrs.

Elementary Education with Driver Education Endorsement: completion of the elementary education program, plus:
 HPES 219  Psychological Factors in Driving, 3 hrs.
 HPES 433  Driver Education, 3 hrs.
 HPES 434  Organization and Administration of Drivers-Traffic Safety, 3 hrs.

Adolescent Licensure 7-12

Requirements for licensure in the various adolescent teaching fields may be obtained in the office of the Center for Teacher Education. Additionally, all students must complete a minimum four-hour computer science course and minimum four-hour mathematics course.

Adolescent Licensure Programs are offered in the following areas:
 Integrated Science
 Integrated Language Arts
 Integrated Mathematics
 Integrated Social Studies
 Life Science
 Physical Science
Professional Education Course Requirements:
(Students must be admitted to the teacher education program.)

EDUC 115  Culture and Schooling, 4 hrs.
EDUC 150  Five-Day Field Experience, 0 hrs. (taken twice)
EDUC 210  Exceptional Learner, 4 hrs.
EDUC 224  Young and Late Adolescent Psychology, 4 hrs.
EDUC 285  Curriculum, 4 hrs.
EDUC 320  Educational Technologies, 4 hrs.
•EDUC 342  Reading in the Content Area, 4 hrs.
•EDUC 440  Classroom Strategies, 4 hrs.
•EDUC 445  Organization and Administration of American Schools, 2 hrs.

Specific Methods Courses:
(Students must be admitted to the teacher education program in order to take these courses.)

EDUC 451  Integrated Science Methods, 4 hrs.
EDUC 452  Integrated English/Language Arts Methods, 4 hrs.
EDUC 453  Integrated Social Studies Methods, 4 hrs.
EDUC 454  Integrated Mathematics Methods, 4 hrs.
EDUC 475  Student Teaching Seminar, 1 hr.
EDUC 480  Student Teaching, 15 hrs.

Multiage Licensure Programs are offered in the following areas:

Art
Health
Physical Education
Foreign Language
Music

Multiage Licensure Programs are offered in the following areas:

Professional Education Course Requirements:
(Students must be admitted to the teacher education program.)

EDUC 115  Culture and Schooling, 4 hrs.
EDUC 150  Five-Day Field Experience, 0 hrs. (taken twice)
EDUC 210  Exceptional Learner, 4 hrs.
EDUC 223  Child Development and Psychology, 4 hrs.
EDUC 224  Young and Late Adolescent Psychology, 4 hrs.
EDUC 285  Curriculum, 4 hrs.
EDUC 320  Educational Technologies, 4 hrs.
•EDUC 342  Reading in the Content Area, 4 hrs.
•EDUC 440  Classroom Strategies, 4 hrs
•EDUC 445  Organization and Administration of American Schools, 2 hrs.

Specific Methods Courses:
(Students must be admitted to the teacher education program in order to take these courses.)

EDUC 456  Integrated Modern Language Methods, 4 hrs.
EDUC 457  Integrated Art Methods, 4 hrs.
EDUC 459  Integrated Music Methods, 4 hrs.

Requirements for licensure in the various multiage licensure areas may be obtained in the office of the Center for Teacher Education. Additionally, all students must complete a minimum four-hour computer science course and a minimum four-hour mathematics course.
EDUC 460 Integrated Health Methods, 4 hrs.
EDUC 461 Integrated Physical Education Methods, 4 hrs.
EDUC 470 Student Teaching, 7 hrs.
EDUC 475 Student Teaching Seminar 1 hr.
EDUC 480 Student Teaching, 8 hrs.

Vocational Licensure 4-12
Requirements for vocational licensure 4-12 may be obtained in the office of the Center for Teacher Education.

Vocational Licensure Programs are offered in the following area:
Technology Education

Professional Education Course Requirements:
(Student must be admitted to the teacher education program.)

EDUC 115 Culture and Schooling 4 hrs.
EDUC 150 Five-Day Field Experience, 0 hrs. (taken twice)
EDUC 210 Exceptional Learner, 4 hrs.
EDUC 224 Young and Late Adolescent Psychology, 4 hrs.
EDUC 285 Curriculum, 4 hrs.
•EDUC 342 Reading in the Content Area, 4 hrs.
•EDUC 445 Organization and Administration of American Schools, 2 hrs.

Specific Methods Courses:
(Student must be admitted to the teacher education program in order to take these courses.)

EDUC 304 Strategies for Technology Education, 4 hrs.
EDUC 458 Organization and Methods of Technology Education, 4 hrs.
EDUC 470 Student Teaching, 7 or 15 hrs.
EDUC 475 Student Teaching Seminar, 1 hr.
EDUC 480 Student Teaching, 8 or 15 hrs.

Secondary Education (7-12) Certification
(Only for students who were admitted prior to September, 1998.)
Requirements for certification in the various secondary teaching fields may be obtained in the office of the Center for Teacher Education. Additionally, all students must complete a minimum four-hour computer science course and a minimum four-hour mathematics course.

Secondary Education Certification programs are offered in the following areas:
Biological Science
Bookkeeping/Basic Business
Chemistry
Comprehensive Communications
Computer Science
Drama/Theatre
Economics
English
General Science
History
Mathematics
Physical Education
Physics
Political Science
Psychology/Sociology
Sales
Science Comprehensive
Social Studies Comprehensive
Speech/Communication

Professional Educational Course Requirements
EDUC 115 Culture and Schooling, 4 hrs.
EDUC 150 Five-Day Field Experience, 0 hrs. (taken twice)
EDUC 225 Child and Adolescent Psychology, 4 hrs.
EDUC 263 Education Psychology, 4 hrs.
EDUC 285 Curriculum, 4 hrs.
EDUC 320 Educational Technologies, 4 hrs.
•EDUC 342 Reading in the Content Area, 4 hrs.
•EDUC 440 Classroom Strategies, 4 hrs.
•EDUC 445 Organization and Administration of American Schools, 2 hrs.

•Specific Methods Courses:
•EDUC 451 Secondary Science Methods, 5 hrs.
•EDUC 452 Secondary English Methods, 4 hrs.
•EDUC 453 Social Studies Methods, 4 hrs.
•EDUC 454 Methods in Teaching Secondary Schools Mathematics, 4 hrs.
•EDUC 458 Organization and Methods of Teaching Technology Education, 4 hrs.
•EDUC 461 Physical Education Methods, 4 hrs.
•EDUC 475 Student Teaching Seminar, 1 hr.
•EDUC 480 Student Teaching, 15 hrs.

Secondary Education Certification with Reading (K-12) Endorsement: completion of requirements in a specific teaching field, plus:
ELED 312 Whole Language Reading I, 4 hrs.
ELED 314 Whole Language Reading II, 4 hrs.
ELED 340 Diagnosis and Correction of Reading Difficulties, 3 hrs.
ELED 341 Advanced Reading Methods and Materials: Clinical Practice in Remedial Reading, 3 hrs.
Secondary Education Certification with Driver Education Endorsement: completion of requirements in specific teaching field, plus:

- HPES 219 Psychological Factors in Driving, 3 hrs.
- HPES 433 Driver Education, 3 hrs.
- HPES 434 Organization and Administration of Drivers Traffic Safety, 3 hrs.

All-Grades (K-12) Certification
(Only for students who were admitted prior to September, 1998.)

Requirements for certification in the various All-Grades (K-12) areas may be obtained in the office of the Center for Teacher Education. Additionally, all students seeking Secondary and All-Grades certification must complete a minimum four-hour computer science course and a minimum four-hour mathematics course.

All-Grades (K-12) Education Certification programs are offered in the following areas:
- Art, Visual
- Health Education
- Languages:
  - French
  - Spanish
  - French/Spanish Dual
- Music
- Physical Education
- Technology

Professional Education course requirements:

- EDUC 115 Culture and Schooling, 4 hrs.
- EDUC 150 Five-Day Field Experience, 0 hrs. (taken twice)
- EDUC 225 Child and Adolescent Psychology, 4 hrs.
- EDUC 285 Curriculum, 4 hrs.
- EDUC 320 Educational Technologies, 4 hrs.
- EDUC 342 Reading in the Content Area, 4 hrs.
- EDUC 440 Classroom Strategies, 4 hrs.
- EDUC 445 Organization and Administration of American Schools, 2 hrs.

Specific Methods Courses:
- EDUC 304 Strategies for Technology Education, 4 hrs.
- EDUC 456 Foreign Language Methods, 4 hrs.
- EDUC 457 Art Methods, 4 hrs.
- EDUC 458 Organization and Methods of Technology Education, 4 hrs.
- EDUC 459 Music Methods, 4 hrs.
- EDUC 460 Health Methods, 4 hrs.
- EDUC 461 Physical Education Methods, 4 hrs.
- EDUC 470 Student Teaching, 7 hrs.
- EDUC 475 Student Teaching Seminar, 1 hr.
- EDUC 480 Student Teaching, 8 hrs.
115 - CULTURE AND SCHOOLING
4.00 Credits
The philosophical, historical, and sociological aspects of education used to investigate the cultural factors that impact students and curriculum including diverse world views, values, norms, and history of multicultural American groups. Characteristics, legislation, programs, and strategies for identifying and working with exceptional students in the classroom are stressed. Clinical hours are awarded and a 5-day field experience is required. Required of all Early Childhood Education, Middle Childhood Education, Adolescent Level and Multiage Level majors.

150 - FIVE-DAY FIELD EXPERIENCE
.00 Credits
Observation and participation with students and teachers in a school setting for five consecutive school days and a minimum of 35 hours. Must be repeated one time. One experience must be in a culturally, racially and socioeconomically diverse setting. Required during freshman or sophomore year of all students seeking teacher licensure. Approval of education advisor is required prior to this experience. Graded S/U. Prerequisite: EDUC 115.

190 - SPECIAL TOPICS IN EDUCATION
1.00 to 4.00 Credits
Can be repeated as the topic varies.

195 - ORIENTATION
1.00 Credit
Familiarization with the department, requirements for majors, planning program of courses and field-based experiences, University catalog, and library. Required of early childhood education and middle childhood education majors. Graded S/U.

210 - EXCEPTIONAL LEARNER
4.00 Credits
A course for education majors. To familiarize students with the varying characteristics and needs of exceptional individuals, their rights under the law and programming alternatives developed to meet their needs. Prerequisite: EDUC 115.

220 - INTEGRATED FINE ARTS
4.00 Credits
Translation of knowledge of and experiences in the visual and performing arts into appropriate integrated experiences. Styles and modes of visual and performing arts across cultures and from various periods of history.

223 - CHILD DEVELOPMENT AND PSYCHOLOGY
4.00 Credits
Characteristics of the child at different levels of maturity; physical, mental, social and emotional growth; growth and organization of meanings and concepts; controls and factors in social behavior; personality developments. Includes a minimum of 30 hours of clinical field experience. A criminal record check is required. Prerequisite: EDUC 115.

224 - YOUNG AND LATE ADOLESCENT PSYCHOLOGY
4.00 Credits
The physical, social, emotional, and intellectual development of early and late adolescents, and the corresponding implications for curriculum and instruction. Includes a minimum of 30 hours of field experience. Prerequisite: EDUC 115.

230 - EARLY CHILDHOOD MATHEMATICS
4.00 Credits
Content, strategies, materials, and evaluation that reflect the current emphasis in mathematics. Includes 30 hours of field experience. Prerequisites: MATH 172 and 173.

240 - INTRODUCTION TO EARLY CHILDHOOD EDUCATION
4.00 Credits
History, philosophy and current developments in the field of early childhood education. Includes 20 hours of field experience. Prerequisites: EDUC 115 and 223.

241 - EARLY CHILDHOOD METHODS AND INSTRUCTION
4.00 Credits
Teaching processes and development of materials for early childhood settings. Planning methodology and strategies. Includes 20 hours of field experience. Prerequisite: EDUC 240.

242 - EARLY CHILDHOOD CURRICULUM AND POLICIES
4.00 Credits
The comprehensive examination of the curriculum of early childhood programs and the policies of the early childhood movement. Curriculum planning and organization. Includes 20 hours of field experience. Prerequisites: EDUC 240 and 241.
260 - INTRODUCTION TO MIDDLE CHILDHOOD EDUCATION
4.00 Credits
The history, philosophy, and organization of middle school education. Evaluation of multimedia materials, creative exploration, and enrichment activities to build an effective middle school. Includes 20 hours of field experience. Prerequisites: EDUC 115 and 224.

261 - MIDDLE CHILDHOOD METHODS AND INSTRUCTION
4.00 Credits
Integrated teaching at the middle school level. Planning, instruction, strategies, and evaluation of an interdisciplinary nature. Includes 20 hours of field experience. Prerequisites: EDUC 115, 224, and 260.

262 - MIDDLE CHILDHOOD CURRICULUM AND POLICIES
4.00 Credits
The development of theory, organization, and decision making in middle school curriculum from integrated, interdisciplinary focus. Includes 20 hours of field experience. Prerequisites: EDUC 115, 225, 260 and 261.

285 - CURRICULUM
4.00 Credits
School curriculum practices, instructional materials, curriculum development changes and trends. Discussion of mainstreaming and gifted education. Designed for adolescent and multiage education majors. Includes 30 hours of clinical field experience. Prerequisite: EDUC 115.

290 - SPECIAL TOPICS IN EDUCATION
1.00 to 4.00 Credits
Can be repeated as the topic varies.

304 - STRATEGIES FOR TECHNOLOGY EDUCATION
4.00 Credits
Technology and technical activity at the middle school level to assist the children in learning. The use of materials, tools and processes to enhance learning and to assist in developing interests and talents. The rationale, materials, creative and manipulative activities. Typical problems and the planning and organizing of the learning environment. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

308 - MIDDLE SCHOOL MATH METHODS
4.00 Credits
Methods and current issues in middle school mathematics teaching, including problem solving, technology, strategies, and teaching aids. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

309 - MIDDLE SCHOOL SCIENCE METHODS
5.00 Credits
Science in middle school education, the preparation of materials, and organization of learning activities for problem solving. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

310 - INTEGRATED LANGUAGE ARTS
4.00 Credits
An integrated or whole language approach is taken in this course and is based on cognitive, developmental, and psycholinguistic theories about how students learn. Knowledge and appreciation of children's books, teaching of creative writing. Encompasses strategies showing how to integrate all of the language arts with an emphasis on children's literature. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

311 - MIDDLE SCHOOL SOCIAL STUDIES METHODS
4.00 Credits
Objectives, trends, issues, and evaluation of the teaching of social studies in the middle school. Includes the preparation of units and organization of learning activities for problem solving. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

312 - TEACHING PHONICS
5.00 Credits
Emphasis on how to teach phonics, word recognition skills and communication skills including listening and speaking. Includes 30 hours of field experience (including 10 clinical hours). Prerequisite: Admission to the teacher education program.

314 - FOUNDATIONS OF READING AND ASSESSMENTS
5.00 Credits
Principles and methods of teaching reading including whole language, phonics, creative writing, diagnostic skills, and preparation and evaluation of reading materials. Includes 30 hours of field experience (including 10 hours clinical). Prerequisites: Admission to the teacher education program and EDUC 312.
320 - INSTRUCTIONAL MEDIA AND EDUCATIONAL TECHNOLOGIES
4.00 Credits
The role that technologies play in our schools of today as well as in American society. Emphasis on instruction, planning, selection, utilization, operation, production, and evaluation of media equipment and materials including motion, media, projected visuals, audio media, computers, and multimedia systems. Includes 10 hours of clinical experience. Prerequisites: EDUC 115 and juniors or seniors seeking teacher licensure.

340 - DIAGNOSIS AND CORRECTION OF READING DIFFICULTIES
4.00 Credits
Reading difficulties and related causal factors. Investigation and utilization of diagnostic procedures and techniques, including experience in administration and interpretation. Appropriate teaching procedures for reading. Prerequisites: EDUC 312 and 314, and admission to the teacher education program.

342 - READING IN THE CONTENT AREA
4.00 Credits
Strategies for facilitating student/text interaction in a variety of curricular areas. Emphasis on the following aspects of reading: assessment of student and text; prereading, vocabulary, and comprehension strategies; study skills. Includes 30 hours of clinical field experience. Prerequisite: Admission to the teacher education program.

350 - DEPARTMENTAL FIELD EXPERIENCE
.00 Credits
Individually planned field experience based on an area of certification purposes and objectives and/or student teaching objectives. Specific objectives and experience proposed by student and must be approved by major department and education advisors. Required for adolescent or multiage licensure if 300 hours of field experience is not complete in other professional education courses. Graded S/U. May be repeated once.

390 - SPECIAL TOPICS IN EDUCATION
1.00 to 4.00 Credits
Can be repeated as the topic varies.

440 - CLASSROOM STRATEGIES
4.00 Credits
Teaching behavior, techniques, methods, and strategies that are required for effective instruction in adolescent and multiage classrooms. Focuses on other aspects of effective teaching such as positive teacher beliefs, evaluation, and classroom management. Includes 30 hours of field experience. Note: EDUC 440 does not fulfill the specific methodology requirement for adolescent and multiage education majors. Prerequisite: Admission to the teacher education program.

445 - ORGANIZATION AND ADMINISTRATION OF SCHOOLS IN AMERICAN SOCIETY
2.00 Credits
Professional issues and orientation to school administrative structure, job search strategies, educational law, educational finance and the politics of education. Prerequisites: Admission to the teacher education program and senior status.

451 - INTEGRATED SCIENCE METHODS
5.00 Credits
Methods, strategies and safety considerations for classroom and laboratory instruction in science. Topics include laboratory planning, laboratory management, laboratory safety, science-technology-society, computer-assisted instruction, materials procurement and materials storage. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

452 - INTEGRATED ENGLISH/LANGUAGE ARTS METHODS
4.00 Credits
Effective methods in teaching grammar, writing, and literature. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

453 - INTEGRATED SOCIAL STUDIES METHODS
4.00 Credits
Effective methods in teaching History, Political Science, Psychology, Sociology, Geography, Economics and Anthropology. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

454 - INTEGRATED MATHEMATICS METHODS
4.00 Credits
Methods and current issues in high school mathematics teaching including guided discovery, problem solving, diagnosis and remediation, technology, strategies, and teaching aids. This course will not count toward a major in mathematics. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.
456 - INTEGRATED MODERN LANGUAGE METHODS
4.00 Credits
Theory and practice of current methods for teaching modern languages; evaluation of textbooks; use of audio-visual media; methods of evaluating student progress. Includes 30 hours of field experience. Prerequisites: minimum of 18 hours in foreign languages; admission to the teacher education program.

457 - INTEGRATED ART METHODS
4.00 Credits
Effective strategies dealing with materials, techniques and methods of instruction in art. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

458 - ORGANIZATION AND METHODS OF TECHNOLOGY EDUCATION
4.00 Credits
Philosophical constructs, organizing courses, program and course objectives, preparing lesson plans and industrial materials, laboratory procedures, and administrative practices. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

459 - INTEGRATED MUSIC METHODS
4.00 Credits
Philosophy, techniques, materials, curriculum planning for the music teacher. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program.

460 - INTEGRATED HEALTH METHODS
4.00 Credits
Innovative strategies for the teaching of health education are applied. Attention is given to conceptualizing instruction, specifying instructional objectives, planning units and lessons, utilizing various instructional methods, selecting and using instructional materials, and evaluating teaching effectiveness. Includes 30 hours of field experience. Prerequisite: Admission to the teacher education program. Course is offered winter quarter every other year during the odd/even year.

461 - INTEGRATED PHYSICAL EDUCATION METHODS
4.00 Credits
Methods, devices and techniques which are most effective in teaching of the discipline in the public schools. Includes 30 hours of field experience. Prerequisites: One year of physical education for majors; junior status; and admission to the teacher education program. Course is offered fall quarter every year.

470 - STUDENT TEACHING - EARLY CHILDHOOD-MIDDLE CHILDHOOD
7.00 or 15.00 Credits
Planning and teaching under supervision in the early or middle level grades; weekly seminar on campus. Prerequisites: An overall accumulative point average of 2.5 with no grade less than “C” in education and major courses required for licensure; a minimum of 300 hours of supervised field/clinical experiences; recommendation of the major department advisor and chairperson, professional education advisor, and the Director of Teacher Education. Students seeking multiage licensure enroll for 7 hours. Students seeking early childhood or middle childhood licensure enroll for 15 hours. The student teaching experience is for eleven weeks. Corequisite: EDUC 475. Graded S/U.

475 - STUDENT TEACHING SEMINAR
1.00 Credit
Weekly seminar to be taken concurrently with student teaching. Includes such discussion topics as classroom management, legal aspects, communication with parents, licensure and interviewing techniques, etc. Graded S/U, based upon attendance. Corequisite: EDUC 470 and 480.

480 - STUDENT TEACHING-adolescent
8.00 or 15.00 Credits
Planning and teaching under supervision in the adolescent level, full time, five days per week for 11 weeks, in the major teaching field of the student; weekly seminar on campus. Prerequisite: An overall accumulative point average of 2.5 with no grade less than “C” in education or major courses required for licensure; a minimum of 300 hours of supervised clinical/field experiences; recommendation of the major department advisor and chairperson, professional education advisor, and Director of Teacher Education. Students seeking multiage licensure enroll for 8 hours. Students seeking 7-12 licensure enroll for 15 hours. Corequisite: EDUC 475. Graded S/U.

490 - SPECIAL TOPICS IN EDUCATION
1.00 to 4.00 Credits
Can be repeated as the topic varies.

497 - INDEPENDENT STUDY IN EDUCATION
1.00 to 4.00 Credits
In areas of student interest with permission of the Director of Teacher Education.
DEPARTMENT OF ENGLISH

Professors Banks (Chair), E. McManus, Smith; Associate Professors Cullen, Lietz, Scott; Assistant Professor Willhardt; Visiting Assistant Professor L. McManus; Instructors Croskery, O'Connell

English is, on the one hand, a humanities discipline based on the study of Western and non-Western literary texts as works of art, as sources of personal pleasure and enlightenment, and as means to understanding people and culture. It is, on the other hand, a rhetorical discipline that teaches analytical and creative processes and methods of interpretation through reading and writing.

The English faculty designs its courses for the general education of the university student and for the training of its majors, making use of lecture, discussion, workshop, collaborative teaching strategies, and independent research and reading. As a humane and practical study that develops analytical and communication skills, and individual and cultural awareness, English prepares students for life after college, for professional and business careers, for law school, and for graduate study in English and other disciplines.

The department offers majors in English/Literature, English/Creative Writing, English/Professional Writing, English/Language Arts (for the secondary-school teaching licensure in integrated language arts), and Journalism. It offers minors in Literature, Creative Writing, Professional Writing, and Journalism. The majors include a five-hour senior essay sequence during which the student works with a faculty advisor on a personal research project.

The department encourages complementary majors, minors, or options in other disciplines, including specifically a recommended option or minor in business. The student may also complete two majors or a major and a minor within the department so long as there is no more than 40% duplication of courses within the second major or minor. The department provides opportunities for practical experience, including internships, journalism activities on department and student publications, and activities within the Sigma Tau Delta honor society.

Majors are urged to consider study abroad as part of their English degree. One option is to participate in the university’s cooperative exchange agreement with the University of Wales, Lampeter.

General Education: The B.A. requirement in humanities beyond ENGL 204 may be fulfilled by designated literature courses or by ENGL 341 or 342. Students with an ACT score in English of 27 or above may be waived from ENGL 110.

Major and Minor Programs: 100-level English courses and ENGL 204 do not count toward any major or minor in the department, nor does any English course with a grade below "C." Required cognates for the Major in English/Literature are two courses in Philosophy above the 100 level or one intermediate course in a foreign language (214, 224, 244, 250, or 264). For Literature, Creative Writing, and Language Arts majors, 7 courses (not including the senior essay) must be above the 200 level. For the other majors, the 300/400-level requirements are indicated separately below. Most majors and minors must take a specified number of literature courses from the following core distribution:

British Literature: Medieval/Renaissance/ Jacobean (ENGL 213, 310, 319)
British Literature: Restoration/Eighteenth-Century/ Romantic (ENGL 213, 214, 322, 323)
British Literature: Victorian/Twentieth-Century (ENGL 214, 324, 326)
American Literature: Pre-Twentieth-Century (ENGL 211, 334)
American Literature: Twentieth-Century (ENGL 212, 335)
World Literature: Ancient to Modern (ENGL 208, 209, 219, 220, 262, 432, 451)

Other courses, whose content changes significantly with each offering, may also satisfy these literature requirements: ENGL 207, 261, 263, 290, 364, 365, 390, 430, 431, 490.

Major in English/Literature (53 hours)
Required Courses (29 hours)
ENGL 210 English Studies
ENGL 213, 214 British Literature 1 and 2
or
ENGL 211, 212 American Literature 1 and 2
ENGL 351 English Language
ENGL 384 Directed Reading
ENGL 410 Chaucer
ENGL 412 Shakespeare Studies
ENGL 483-85 The Senior Essay
Electives (24 hours)

Five courses in five core areas in British, American, and world literature
One free elective (literature, criticism, or writing)

Major in English/Creative Writing (56 hours)
Creative Writing Core (28 hours)
ENGL 251 Magazine Practicum
ENGL 341 Poetry Writing
ENGL 342 Fiction Writing
ENGL 384 Directed Reading
ENGL 443 Nonfiction Writing
ENGL 451 Literary Criticism
ENGL 483-5 Senior Essay
COMM 486 Playwriting

Language and Literature Core (28 hours)
ENGL 210 English Studies
ENGL 351 English Language
Major in English/Professional Writing
(56 hours + Secondary Study)

Professional Writing Core (32 hours)

ART 222 Graphic Design 1
COMM 236 Public Relations Writing
ENGL 243 Magazine Writing
ENGL 251 Magazine Practicum
ENGL 347 Advanced Writing
ENGL 384 Directed Reading
ENGL 443 Nonfiction Writing
ENGL 470 Editing
ENGL 481 Internship
ENGL 483-5 Senior Essay

Core Elective (4 hours)
ART 223 Graphic Design 2
ENGL 241 News Writing
COMM 256 Writing for Broadcasting and Electronic Media
ENGL 342 Fiction Writing
ENGL 343 Persuasive Writing
ENGL 346 Prelaw Writing
ENGL 377 Professional Writing Workshop
ENGL 451 Literary Criticism

Special topics courses (290, 390, 490) when the topic is writing

Language and Literature Core (20 hours)
ENGL 210 English Studies
ENGL 351 English Language

Three literature courses in three core areas, two at the 300/400 level:
World Literature (ENGL 208, 209, 219, 220, 262, 432, 451)
British Literature (ENGL 213, 214, 260, 310-326, 364, 410, 412)
American Literature (ENGL 211, 212, 261, 334, 335, 365, 431)

Other courses, whose content changes significantly with each offering, may also satisfy these literature requirements: ENGL 207, 263, 290, 390, 430, 490.

Secondary Study
An Option, Minor, or Second Major in a discipline other than English

Major in Journalism
(62 hours + Secondary Study)

Journalism Core Requirements (38 hours)
ART 222 Graphic Design 1
COMM 236 Public Relations Writing
ENGL 241 News Writing
ENGL 243 Magazine Writing
ENGL 250 Newspaper Practicum
ENGL 371 Journalism
ENGL 384 Directed Reading (Journalism related)
ENGL 470 Editing
ENGL 481 Internship
ENGL 483-5 Senior Essay (Journalism related)

Core Elective (4 hours)
COMM 150 Introduction to Broadcasting and Electronic Media
COMM 221 Interviewing
COMM 230 Communication Theory
COMM 256 Writing for Broadcasting and Electronic Media
ENGL 343 Persuasive Writing
ENGL 346 Prelaw Writing
ENGL 347 Advanced Writing
COMM 355 Broadcast Journalism
ENGL 376 Journalism Workshop
ENGL 380 Literary Journalism
ENGL 443 Nonfiction Writing
Special topics courses (290, 390, 490) when the topic is journalism

Language and Literature Core (20 hours)
ENGL 210 English Studies
ENGL 351 English Language
Three literature courses in three core areas, two at the 300/400 level:
World Literature (ENGL 208, 209, 219, 220, 262, 432, 451)
British Literature (ENGL 213, 214, 260, 310-326, 364, 410, 412)
American Literature (ENGL 211, 212, 261, 334, 335, 365, 431)
Other courses, whose content changes significantly with each offering, may also satisfy these literature requirements: ENGL 207, 263, 290, 390, 430, 490.

Secondary Study
An Option, Minor, or Second Major in a discipline other than English

Minor in English/Literature (32 hours)
The Minor in English/Literature requires the completion of 8 4-hour courses selected from those listed below according to the following distribution: 2 American, 2 British, 1 World, 3 electives. At least one American literature course must be before 1900, and at least one British literature course before 1800. At least 4 of the courses must be on the 300/400 level.
British Literature: ENGL 213, 214, 310, 319, 322, 323, 324, 326, 364, 430
American Literature: ENGL 211, 212, 261, 334, 335, 365, 431
World Literature: ENGL 208, 209, 219, 220, 262, 432
Literary Studies: ENGL 210, 451
Creative Writing: ENGL 341, 342, 443, COMM 486
Other courses, whose content changes significantly with each offering, may also satisfy these literature requirements: ENGL 207, 263, 290, 390, 490

Minor in English/Creative Writing (30 hours)
Required Courses (14 hours)
ENGL 251 Magazine Practicum
ENGL 341 Poetry Writing
ENGL 342 Fiction Writing
ENGL 443 Nonfiction Writing or
COMM 486 Playwriting
Writing or Criticism Elective (4 hours)
ENGL 210 English Studies
ENGL 375 Creative Writing Workshop
ENGL 443 Nonfiction Writing
ENGL 451 Literary Criticism
ENGL 486 Playwriting
Literature Electives (12 hours)
Three courses from two core areas

Minor in English/Professional Writing (30 hours)
Required courses (26 hours)
ART 222 Graphic Design 1
COMM 236 Public Relations Writing
ENGL 243 Magazine Writing
ENGL 251 Magazine Practicum
ENGL 347 Advanced Writing
ENGL 443 Nonfiction Writing
ENGL 470 Editing
Elective (4 hours)
ART 223 Graphic Design 2
ENGL 241 News Writing
COMM 256 Writing for Broadcasting and Electronic Media
ENGL 342 Fiction Writing
ENGL 343 Persuasive Writing
ENGL 346 Prelaw Writing
ENGL 377 Professional Writing Workshop
ENGL 451 Literary Criticism
Special topics courses (290, 390, 490) when the topic is writing

Minor in Journalism (30 hours)
Required courses (26 hours)
ART 222 Graphic Design 1
COMM 236 Public Relations Writing
ENGL 241 News Writing
ENGL 243 Magazine Writing
ENGL 250 Newspaper Practicum
ENGL 371 Journalism
ENGL 470 Editing
Elective (4 hours)
COMM 150 Introduction to Broadcasting and Electronic Media
COMM 221 Interviewing
COMM 230 Communication Theory
COMM 256 Writing for Broadcasting and Electronic Media
ENGL 343 Persuasive Writing
ENGL 346 Prelaw Writing
ENGL 347 Advanced Writing
COMM 355 Broadcast Journalism
ENGL 376 Journalism Workshop
ENGL 380 Literary Journalism
ENGL 443 Nonfiction Writing
Special topics courses (290, 390, 490) when the topic is journalism
000 - ENGLISH ORIENTATION
1.00 Credit
Familiarization with department faculty, students, programs, and technology. Emphasis on career development within a liberal arts framework. Introduction to general university services and activities. Required of all majors. Graded S/U.

001 - ENRICHMENT
.00 Credits
Enrichment of the curriculum for English majors through required attendance at designated cultural and academic extracurricular events. Must be taken twice each academic year by all English majors. Graded S/U.

105 - WRITING WORKSHOP
4.00 Credits
Instruction and practice in writing for entering students whose English ACT is below 16. Offered Fall Quarter. CREDIT IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY.

110 - WRITING 1
4.00 Credits
Development of reading and writing skills for effective communication on the college level. Prerequisite for all 200-level courses in English. Students with English ACT of 27 or above may be exempted from this course.

111 - WRITING 2
4.00 Credits
Continuation of ENGL 110. Prerequisite for ENGL 204.

151 - COLLEGE COMPOSITION 1
4.00 Credits
Communication skills for non-native speakers of English with emphasis on reading and writing in an academic setting. ENGL 151 and 152 together may be substituted for ENGL 110.

152 - COLLEGE COMPOSITION 2
4.00 Credits
Continuation of ENGL 151. ENGL 151 and 152 together may be substituted for ENGL 110. Prerequisite: ENGL 151 or 110.

153 - COLLEGE COMPOSITION 3
4.00 Credits
Writing skills for non-native speakers of English. ENGL 153 may be substituted for ENGL 111. Prerequisites: ENGL 151 and ENGL 152.

190 - SPECIAL TOPICS IN ENGLISH
1.00 to 4.00 Credits
May be repeated as the topic varies.

Except for ENGL 210, 211-12, 213-14, and 225, 200-level courses are designed for the general student. ENGL 210 is open only to majors and minors. Prerequisites for ENGL 204: ENGL 110, 111, and Sophomore standing. Prerequisite for other 200-level courses: English 110.

204 - GREAT WORKS
4.00 Credits
Major literary texts from the classical period to the present, including Shakespeare. A general education course. An Arts and Sciences requirement. Not open to Freshmen. Does not count toward an English major or minor. Prerequisites: ENGL 110 and 111.

207 - MODERN POETRY
4.00 Credits
Representative twentieth-century poetry written in English.

208 - MODERN WORLD DRAMA
4.00 Credits
Representative twentieth-century plays from Western and non-Western countries.

209 - MODERN FICTION
4.00 Credits
Representative twentieth-century novels, short stories, and other prose fiction from Western and non-Western countries.

210 - ENGLISH STUDIES
4.00 Credits
An introduction to the English major. An overview of literary terms, genres, historical periods, literary theory, and rhetoric; practice in literary criticism and creative writing; an awareness of career opportunities. Required of majors. Open only to majors and minors. Should be taken during the sophomore year.

211 - AMERICAN LITERATURE 1
4.00 Credits
The early period of American Literature (1492-1870s), including such genres as exploration and spiritual narratives, revolutionary political writing, fiction, and poetry, taking into account social and historical context.
212 - AMERICAN LITERATURE 2
4.00 Credits
The early modern, modern, and contemporary periods of American literature (1870s to the present), including such movements as regionalism, realism, naturalism, modernism, and postmodernism in a variety of genres—mainly poetry, fiction, and drama—in a rapidly changing social milieu.

213 - BRITISH LITERATURE 1
4.00 Credits
A survey of British literature from the Anglo-Saxon period through Neo-classicism in the eighteenth century, focusing on major and minor authors as reflective of both continuity and radical change in literary forms and cultural contexts. (Formerly ENGL 201 and 202)

214 - BRITISH LITERATURE 2
4.00 Credits
A survey of British literature from late eighteenth-century Romanticism to the end of the twentieth century, with continuing emphasis on literary themes and forms within changing cultural contexts. (Formerly ENGL 202 and 203)

219 - NON-WESTERN LITERATURE
4.00 Credits
Representative literary works in English or in English translation from the non-Western world. This course satisfies the Arts and Sciences non-Western requirement.

220 - EUROPEAN LITERATURE
4.00 Credits
The Western tradition in literature, including representative continental literature in translation from the Classical Greek era to the present.

225 - CHILDREN’S AND YOUNG ADULT LITERATURE
4.00 Credits
Literature specifically suited for children and adolescents. The readings selected from various genres will be studied using the same critical approaches that are traditionally used to analyze literature for adults. Open to majors in English and in Early Childhood and Middle Childhood Education, and to students selecting the Church Vocation-Education Option. Others by department permission only.

241 - NEWS WRITING
4.00 Credits
Gathering information and writing for a newspaper.

243 - MAGAZINE WRITING
4.00 Credits
The discipline and technique of writing feature articles for magazines.

250 - NEWSPAPER PRACTICUM
1.00 to 6.00 Credits
One to six credits, depending on role, to be determined by department. May be repeated, but only 12 hours will count toward graduation. Graded S/U. (Formerly Journalism Activities-Newspaper)

251 - MAGAZINE PRACTICUM
1.00 to 6.00 Credits
One to six credits, depending on role, to be determined by department. May be repeated, but only 12 hours will count toward graduation. Graded S/U. (Formerly Journalism Activities-Magazine)

260 - INTRODUCTION TO SHAKESPEARE
4.00 Credits
Representative plays and poetry from the entire span of Shakespeare’s career and from each of the genres. For the general student.

261 - AFRICAN-AMERICAN LITERATURE
4.00 Credits
The tradition of African-American literature from the eighteenth-century to the present, including such genres as spiritual and folk poems, autobiography, poetry, short stories, novels and essays, in the context of formative political, historical, and social forces, with a special emphasis on writing as an expression of liberation for the African-American community.

262 - AFRICAN LITERATURE
4.00 Credits
Folktales, traditional epics, and contemporary fiction and drama that reflect African life and thought from the pre-colonial era to present day. This course satisfies the Arts and Sciences non-Western requirement. (Formerly ENGL 370)

263 - WOMEN’S LITERATURE
4.00 Credits
Selected works by or about women in English or in translation, drawn from a variety of genres in all historical eras, viewed from various critical perspectives, including feminist and historical/cultural theories.

290 - SPECIAL TOPICS IN ENGLISH
1.00 to 4.00 Credits
May be repeated as the topic varies.
297 - INDEPENDENT STUDY IN ENGLISH
1.00 to 4.00 Credits
May be repeated as the topic varies.

ENGL 384: English and Journalism majors only. Other 300-level courses are designed for English or Journalism majors and minors but are open to the general student. Prerequisite for 300-level writing courses (ENGL 341, 342, 343, 346, 347, 375-77): ENG 204, or permission of the department. Prerequisites for other 300-level courses: ENGL 204 and one other 200-level literature course, or permission of the department.

310 - BRITISH LITERATURE BEFORE 1500
4.00 Credits The epic, lyric and narrative poetry, tales, myths, and romances, and forms of drama during the early periods of British literature.

319 - RENAISSANCE AND JACOBEAN LITERATURE
4.00 Credits Major writers, themes, movements, or genres from 1485 to 1660, including such figures as Marlowe, Jonson, Spenser, Donne, and Milton.

322 - RESTORATION AND THE EIGHTEENTH CENTURY
4.00 Credits The “early modern” period of British literature (1660-1800), including such literary genres as the early novel, neo-classical poetry, and laughing and sentimental comedy, as well as formative political, historical, and social forces.

323 - BRITISH ROMANTICISM
4.00 Credits Revolutionary changes in British literature between 1790 and 1832, including such innovative thinkers and writers as Blake, the Wordsworths, Coleridge, Byron, Keats, the Shelleys, Wollstonecraft, Radcliffe and Scott.

324 - VICTORIAN PERIOD
4.00 Credits British literature between 1832 and 1901, with concentration on a few selected writers.

326 - TWENTIETH-CENTURY BRITISH LITERATURE
4.00 Credits British literature from 1900 to the present, with concentration on a few selected writers.

334 - AMERICAN WRITERS 1
4.00 Credits American literature from 1492 to the 1870s, with concentration on a few selected writers or themes in the context of literary and social influences.

335 - AMERICAN WRITERS 2
4.00 Credits American literature from the 1870s to the present, with concentration on a few selected writers or themes in the context of literary and social influences.

341 - POETRY WRITING
4.00 Credits The discipline and technique of writing poetry. May be continued as ENGL 498-Independent Study in Writing.

342 - FICTION WRITING
4.00 Credits The discipline and technique of writing fiction. May be continued as ENGL 498-Independent Study in Writing.

343 - PERSUASIVE WRITING
4.00 Credits Analysis of and practice in using traditional rhetorical strategies of persuasion.

346 - PRELAW WRITING
4.00 Credits Analysis of fact situations and the writing of quasi-legal essays, memoranda, and briefs. Emphasis on close reading, logical thinking, and clear written expression in standard English.

347 - ADVANCED WRITING
4.00 Credits An understanding of and practice in writing various academic genres, from research and analysis to book reviews and abstracts.

351 - THE ENGLISH LANGUAGE
4.00 Credits Grammar of the English language as phonology, morphology, and syntax, and a brief history of American English.

364 - THE BRITISH NOVEL
4.00 Credits Representative novels, from the early development of the genre in the eighteenth century to romantic and social novels of the nineteenth and experimental novels of the twentieth centuries.

365 - THE AMERICAN NOVEL
4.00 Credits Selected novels from the eighteenth century to the present in the context of diverse literary and social influences.
371 - JOURNALISM
4.00 Credits
American journalism history and principles; contemporary ethical, legal, and diversity issues; the press as a cultural force in society. Prerequisites: ENGL 204 and 241.

375 - CREATIVE WRITING WORKSHOP
1.00 to 4.00 Credits
Individualized instruction in writing poetry and fiction within a workshop environment. Prerequisites: ENGL 204 and one of the following, ENGL 341, 342, 443, COMM 486, or permission of the department.

376 - JOURNALISM WORKSHOP
1.00 to 4.00 Credits
Individualized instruction in writing for the print media within a workshop environment. Prerequisites: ENGL 204 and 241, or permission of the department.

377 - PROFESSIONAL WRITING WORKSHOP
1.00 to 4.00 Credits
Individualized instruction in writing for publication within a workshop environment. Prerequisites: ENGL 204 and either 243 or 443 or permission of the department.

380 - LITERARY JOURNALISM
4.00 Credits
The journalist as a creator of literature: the transformation of significant literary figures from working journalists to award-winning fiction writers and the writing techniques they employ. Includes such authors as Ernest Hemingway, John Hersey, Tom Wolfe, Jimmy Breslin and Hunter Thompson. Prerequisites: ENGL 204 and 241.

384 - DIRECTED READING
1.00 Credit
Independent reading and tutorial under the supervision of an instructor. This course begins the senior essay sequence, which continues with ENGL 483-485. Usually taken during the spring quarter of the junior year. Open only to juniors who are English majors or minors. Graded S/U.

390 - SPECIAL TOPICS IN ENGLISH
1.00 to 4.00 Credits
May be repeated as the topic varies.

ENGL 420, 483-85: English and Journalism majors only. Other 400-level courses are designed for English or Journalism majors and minors but are open to the general student. Prerequisites for writing courses, ENGL 443 and 470: ENGL 204 and two other English courses above the 100-level, or permission of the department. Prerequisites for other 400-level courses: ENGL 204 and two other literature courses, or permission of the department.

410 - CHAUCER
4.00 Credits
The poetry of Chaucer, with special emphasis on the Canterbury Tales, Troilus and Criseyde, and reading and understanding Middle English.

412 - SHAKESPEARE STUDIES
4.00 Credits
Close reading and analysis of Shakespeare’s plays within their historical context using a variety of critical approaches. May be repeated as content varies.

420 - DEPARTMENT NEWSLETTER
2.00 Credits
Writing and laying out the annual department newsletter.

430 - READINGS IN ENGLISH LANGUAGE LITERATURE
4.00 Credits
A major writer, genre, or theme in the literatures of Great Britain or other English-speaking countries, not including the United States, with attention to the cultural context.

431 - READINGS IN AMERICAN LITERATURE
4.00 Credits
A major writer, genre, or theme in American literature, with attention to cultural context.

432 - STUDIES IN COMPARATIVE LITERATURE
4.00 Credits
Issues of special interest to English majors about literary texts from ancient times to the present that highlight differences between Western and non-Western literatures. This course satisfies the Arts and Sciences non-Western requirement.

443 - NONFICTION WRITING
4.00 Credits
A literary approach to the reading and writing of nonfiction essays.
451 - LITERARY CRITICISM
4.00 Credits
Major literary theories of the twentieth century and their historical antecedents, with emphasis on theories currently practiced in university classes and academic journals. (Formerly ENGL 381)

470 - EDITING
4.00 Credits
Editing techniques and concerns critical to producing polished writing on a variety of levels, from corporate communications to book publishing.

481 - INTERNSHIP
1.00 to 16.00 Credits
Internships in English are designed to provide practical experience outside the classroom and to enhance the student's professional interests. Prerequisite: Courses appropriate for the internship. Graded S/U.

483 - READING FOR THE SENIOR ESSAY
1.00 Credit
Independent reading in preparation for the senior essay. Prerequisite: ENGL 384. Graded S/U.

484 - SENIOR ESSAY 1
1.00 Credit
Writing of a rough draft of the Senior Essay. Prerequisite: ENGL 483.

485 - SENIOR ESSAY 2
2.00 Credits
Final draft and oral presentation of the Senior Essay. Prerequisite: ENGL 484.

490 - SPECIAL TOPICS IN ENGLISH
1.00 to 4.00 Credits
May be repeated as the topic varies.

497 - INDEPENDENT STUDY IN LITERATURE
1.00 to 4.00 Credits
May be repeated as the topic varies.

498 - INDEPENDENT STUDY IN WRITING
1.00 to 4.00 Credits
May be repeated as the topic varies.

499 - INDEPENDENT STUDY IN JOURNALISM
1.00 to 4.00 Credits
May be repeated as the topic varies.

DEPARTMENT OF HEALTH, PHYSICAL EDUCATION & SPORT STUDIES

Professor Lauth (Chair); Associate Professors Campoli, Glon, Keller, Strayer; Assistant Professors Beaschler, Chandler, Coleman, Kaczkowski, Meyer, Witte; Instructors Hofman, Kodish, Simmons, Wilson; Lecturers Cole, Jones, Ridenour

Mission Statement
The department of health, physical education and sport studies' purpose is to help individuals achieve optimum personal development and contribute to the goals of Ohio Northern University and the College of Arts and Sciences. We educate students to become responsible professionals capable of exemplary service in a variety of roles in education and/or sport.

We strive to provide equally accessible opportunities for experience working and playing in a community of students and scholars where application, honesty, hard work, achievement, and appropriate behavior are recognized and encouraged. The education program in the department is designed to equip students with skills and attitudes to design, implement and maintain vital programs in their selected professions. We seek to develop the basis for philosophical reflection on the ethical issues facing the professions. We encourage our students to develop the values of responsibility, thoroughness, respect for others, and ethical behavior. Considerable amount of attention is devoted to developing an appreciation of the importance of health, fitness, and sport and their contribution to quality of life.

The bachelor of arts and bachelor of science degrees are available to students enrolled in the department with the opportunity to major in the following academic areas:

- Physical Education (pre K-12) 74-76 hours
- Health Education (pre K-12) 54 hours
- Physical Education (non-teaching) 57-59 hours
- Athletic Training 65 hours
- Sport Management 78 hours
- Wellness 66 hours

The department provides majors an opportunity to acquire both a business option (28 hours) and a management concentration (36 hours).
The department provides courses of study leading to endorsement in the following areas:

- Driver Education - by the state of Ohio 9 hours
- Athletic Coaching Certification - by Ohio Northern University 22-25 hours

For specific information concerning these areas, please contact the health, physical education and sport studies department chairperson.

Physical Education Service Courses
Service courses are those courses, other than varsity sports, listed below the 100 level (AHPE). Physical education service classes meet two hours per week for one hour credit. Classes are graded on the S/U basis. Students in all colleges with a physical education requirement are required to take a minimum of three hours, except for physical education majors.

Three different areas of activity classes are offered in the service course program to provide diversity in physical education experiences for the university student.

Wellness Area:
- Wellness Lab
- Weight Control and Nutrition

Fitness Area:
- Beginning Fitness
- Intermediate Fitness
- Advanced Fitness
- Weight Training and Physical Conditioning
- Aerobic Activities
- Dance Aerobics
- Aquatic Exercise

Lifetime Activities Area:
- Golf
- Tennis
- Beginners Swimming
- Intermediate Swimming
- Hiking and Backpacking
- Rhythmic Fundamentals
- Sailing and Seamanship
- Snow Skiing
- Social Dance
- Canoeing and Whitewater Rafting
- Bowling
- Billiards
- Archery
- Racquetball
- Self Defense
- Square and Folk Dance
- Volleyball
- Badminton

Special Equipment or Fee Requirements for HPESS Department Courses
AHPE activity class special equipment/fee requirements:
- Tennis—tennis balls and racquet
- Golf—clubs (when possible)
- Intermediate Fitness—bicycle
- Racquetball—racquet, racquetballs, protective goggles
- Canoeing and Whitewater Rafting—fee required
- Bowling—fee required
- Billiards—fee required
- Snow Skiing—fee required
- Hiking and Backpacking—fee required

HPESS class special equipment/fee requirements:
- First Aid-Responding to Emergencies—fee required
- Community CPR—fee required
- Lifeguarding—pocket mask and fee required
- Water Safety Instruction—fee required

Majors in Health, Physical Education and Sport Studies
Special Requirements for Majors
1. All required courses and electives in the curricula of the student's major must be completed with a grade of "C" or better to satisfy graduation requirements.
2. In coaching theory course requirements, only one officiating course may apply.
3. Physical education majors are exempt from the three-hour service class requirement, but all other department majors must comply with this requirement.
4. Majors desiring teacher licensure must complete requirements of the Center for Teacher Education.
5. Students desiring to major in athletic training must be admitted to the athletic training program. Specific requirements may be obtained from the department of health, physical education and sport studies or the athletic training offices.
6. All students with a major in the HPESS department must fulfill a computer proficiency requirement in order to graduate. Specific requirements may be obtained from the HPESS department offices.

NOTE: numbers in ( ) indicate credit hours
Physical Education (pre K-12) 74-76 hours
- HPES 000 Orientation (1)
- HPES XXX Aquatics course (1-3)
- HPES 112 First Aid (2)
- HPES 113 Community CPR (1)
- HPES 132 Gymnastics Methods (2)
- HPES 133 General Methods (2)
- HPES 147 Basic Movement (2)
- HPES 151 HPESS Foundations (4)
HPES 211 Team Sports Majors (2)
HPES 212 Dance Majors (3)
HPES 213 Individual & Dual Activities-Majors (2)
HPES 223 Kinesiology (4)
HPES 243 Basic Athletic Training (4)
HPES 271 Motor Learning (2)
HPES 303 Org. & Admin. (4)
HPES 304 Teach Tech. (1)
HPES 305 Teach Tech. (1)
HPES 324 Sport Psych. (2)
HPES 360 Test Meas. HPE (4)
HPES 402 Adap. & Corr. PE (4)
HPES XXX Coaching Techniques (6)  
(Only one officiating course may apply)

Biology Courses
BIOL 231 Anat. & Physio. I (4)
BIOL 232 Anat. & Physio. II (4)
BIOL 233 Exercise Physio. (4)

Education Courses
EDUC 461 Integrated PE Methods (4)

Physical Education (non-teaching) 57-59 hours
HPES 000 Orientation (1)
HPES XXX Aquatics course (1-3)
HPES 112 First Aid (2)
HPES 113 Community CPR (1)
HPES 132 Gymnastics Methods (2)
HPES 133 General Methods (2)
HPES 147 Basic Movement (2)
HPES 151 HPBSS Foundations (4)
HPES 211 Team Sports Majors (2)
HPES 212 Dance Majors (3)
HPES 213 Individual & Dual Activities-Majors (2)
HPES 223 Kinesiology (4)
HPES 243 Basic Athletic Training (4)
HPES 303 Org. & Admin. (4)
HPES 304 Teach Tech. (1)
HPES 324 Sport Psych. (2)
HPES 360 Test Meas. HPE (4)
HPES 402 Adap. & Corr. PE (4)

Biology Courses
BIOL 231 Anat. & Physio. I (4)
BIOL 232 Anat. & Physio. II (4)
BIOL 233 Exercise Physio. (4)

Education Courses
EDUC 461 Integrated Health Methods (4)

Pharmacy Courses
PHBS 350 Nutrition (3)

Wellness 66 hours
AHPE 099 Wellness Lab (1)
HPES 105 Intro to Wellness (2)
HPES 110 Sci. Basis of Health & Fit. (4)
HPES 111 Personal Health Problems (4)
HPES 112 First Aid-Responding to Emergencies (2)
HPES 113 Community CPR (1)
HPES 223 Kinesiology (4)
HPES 261 Exer. Test & Prescription I (4)
HPES 262 Exer. Test & Prescription II (4)
HPES XXX Wellness Practicum(s) (2)
HPES 355 Org/Adm of Health Promotion (4)
HPES 485 Wellness/Health Promotion Internship (15)

Biology Courses
BIOL 231 Anat. & Physio. I (4)
BIOL 232 Anat. & Physio. II (4)
BIOL 233 Exercise Physio. (4)

Pharmacy Courses
PHBS 350 Nutrition (3)

Electives:
A minimum of three hours from the following:
HPES 119, HPES 360, HPES 402, HPES 494, HPES 381, or COMM 348

Athletic Training Major 65 hours
Students must be admitted to the athletic training program. Specific requirements may be obtained from the department of health, physical education and sport studies or the athletic training offices.
<table>
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<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
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<tr>
<td>HPES 000</td>
<td>Orientation</td>
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<td>HPES 111</td>
<td>Pers. Hlth. Prob.</td>
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<tr>
<td>HPES 112</td>
<td>First Aid</td>
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<tr>
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<td>Community CPR</td>
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<td>Kinesiology</td>
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<td>HPES 243</td>
<td>Basic Athletic Training</td>
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<td>HPES 251</td>
<td>Ath. Train. Clin. 1</td>
<td>1</td>
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<td>HPES 252</td>
<td>Ath. Train. Clin. 2</td>
<td>1</td>
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<td>HPES 275</td>
<td>Eval. Tech. Ath. Tr.</td>
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<tr>
<td>HPES 276</td>
<td>Eval. Tech. Ath. Tr.</td>
<td>4</td>
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<td>HPES 353</td>
<td>Ath. Train. Clin. 3</td>
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<td>HPES 354</td>
<td>Ath. Train. Clin. 4</td>
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<td>HPES 371</td>
<td>Ther. Modal Ath. Tr.</td>
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<td>HPES 372</td>
<td>Exer. Rehab. Ath. Tr.</td>
<td>4</td>
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<tr>
<td>HPES 373</td>
<td>Exer. Rehab. Ath. Tr.</td>
<td>2</td>
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<td>HPES 402</td>
<td>Adapt. &amp; Corr. PE</td>
<td>4</td>
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<tr>
<td>HPES 455</td>
<td>Ath. Train. Clin. 5</td>
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<td>HPES 456</td>
<td>Ath. Train. Clin. 6</td>
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<tr>
<td>HPES 495</td>
<td>Trends Ath. Train.</td>
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**Biology Courses**

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<th>Course Code</th>
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<th>Hours</th>
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<tr>
<td>BIOL 231</td>
<td>Ant. &amp; Physio. 1</td>
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<tr>
<td>BIOL 232</td>
<td>Ant. &amp; Physio. 2</td>
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<tr>
<td>BIOL 233</td>
<td>Exercise Physio.</td>
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**Pharmacy Courses**

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<td>PHBS 350</td>
<td>Nutrition</td>
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**Sport Management Major 78 hours**

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<th>Course Name</th>
<th>Hours</th>
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<td>HPES 000</td>
<td>Orientation</td>
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<tr>
<td>HPES 153</td>
<td>Intro. Spt. Mgm.</td>
<td>4</td>
</tr>
<tr>
<td>HPES 247</td>
<td>Spt. Market/Promo</td>
<td>4</td>
</tr>
<tr>
<td>HPES 256</td>
<td>Soc/Psycho of Sport</td>
<td>4</td>
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<tr>
<td>HPES 303</td>
<td>Org. &amp; Adm.</td>
<td>4</td>
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<tr>
<td>HPES 344,</td>
<td>Practicum (1) (Must take one)</td>
<td>1</td>
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<tr>
<td>345, 346</td>
<td></td>
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<tr>
<td>HPES 410</td>
<td>Ethics in Sport</td>
<td>4</td>
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<tr>
<td>HPES 421</td>
<td>Sport Law</td>
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</tr>
<tr>
<td>HPES 486</td>
<td>Spt. Mgm. Intern</td>
<td>15</td>
</tr>
<tr>
<td>HPES 496</td>
<td>Spt. Mgm. Seminar</td>
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**Communication Arts Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
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<tbody>
<tr>
<td>COMM 130</td>
<td>Intro. Pub. Rel.</td>
<td>4</td>
</tr>
<tr>
<td>COMM 211</td>
<td>Public Speaking</td>
<td>4</td>
</tr>
<tr>
<td>COMM 212</td>
<td>Business and Prof. Spkg.</td>
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<tr>
<td>COMM 236</td>
<td>Public Relations Wrt.</td>
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**Business Administration Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>IBEC 100</td>
<td>Economics</td>
<td>4</td>
</tr>
<tr>
<td>ACCT 211</td>
<td>Prin. of Accounting 1</td>
<td>4</td>
</tr>
<tr>
<td>ABUS 312</td>
<td>Business Law 1</td>
<td>4</td>
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<tr>
<td>MGMT 325</td>
<td>Employment Law</td>
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<tr>
<td>MGMT 333</td>
<td>Mgmt. &amp; Org. Beh.</td>
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**Management Concentration 36 hours**

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>ABUS 201</td>
<td>Personal Computer Applic.</td>
<td>4</td>
</tr>
<tr>
<td>IBEC 202</td>
<td>Prin. of Microeconomics</td>
<td>4</td>
</tr>
<tr>
<td>IBEC 203</td>
<td>Prin. of Macroeconomics</td>
<td>4</td>
</tr>
<tr>
<td>ACCT 212</td>
<td>Principles of Acct. 2</td>
<td>4</td>
</tr>
<tr>
<td>MGMT 325</td>
<td>Employment Law</td>
<td>4</td>
</tr>
<tr>
<td>MRKT 351</td>
<td>Principles of Marketing</td>
<td>4</td>
</tr>
<tr>
<td>FINC 362</td>
<td>Managerial Finance</td>
<td>4</td>
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<tr>
<td>MGMT 363</td>
<td>Human Resource Mgmt.</td>
<td>4</td>
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<tr>
<td>MRKT 371</td>
<td>Personal Selling</td>
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**ONU Coaching Certification 22-25 hours**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
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<tbody>
<tr>
<td>HPES 112</td>
<td>First Aid</td>
<td>2</td>
</tr>
<tr>
<td>HPES 113</td>
<td>Community CPR</td>
<td>1</td>
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<tr>
<td>HPES 243</td>
<td>Basic Ath. Train.</td>
<td>4</td>
</tr>
<tr>
<td>HPES 256</td>
<td>Soc/Psycho of Sport</td>
<td>4</td>
</tr>
<tr>
<td>HPES 303</td>
<td>Org. &amp; Admin.</td>
<td>4</td>
</tr>
<tr>
<td>HPES 324</td>
<td>Psych. of Coaching</td>
<td>2</td>
</tr>
<tr>
<td>HPES 334</td>
<td>Adv. Coach. (1-4)</td>
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</tbody>
</table>

**Subject - Varsity Sports/Service Courses (AHPE)**

All AHPE courses graded S/U

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Hours</th>
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<tbody>
<tr>
<td>001</td>
<td>FOOTBALL PARTICIPATION</td>
<td>1.00</td>
</tr>
<tr>
<td>002</td>
<td>VARSITY CROSS COUNTRY PARTICIPATION (MEN)</td>
<td>1.00</td>
</tr>
<tr>
<td>003</td>
<td>VARSITY SOCCER PARTICIPATION (MEN)</td>
<td>1.00</td>
</tr>
<tr>
<td>004</td>
<td>VARSITY VOLLEYBALL PARTICIPATION</td>
<td>1.00</td>
</tr>
<tr>
<td>005</td>
<td>VARSITY BASKETBALL PARTICIPATION (MEN)</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Majors in the HPESS department may select the College of Arts and Sciences Business Op-
006 - VARSITY BASKETBALL PARTICIPATION (WOMEN)  
1.00 Credit

007 - VARSITY CROSS COUNTRY PARTICIPATION (WOMEN)  
1.00 Credit

008 - VARSITY SOCCER PARTICIPATION (WOMEN)  
1.00 Credit

010 - VARSITY TRACK PARTICIPATION (WOMEN)  
1.00 Credit

011 - VARSITY WRESTLING PARTICIPATION  
1.00 Credit

012 - VARSITY TRACK PARTICIPATION (MEN)  
1.00 Credit

013 - VARSITY TENNIS PARTICIPATION (MEN)  
1.00 Credit

014 - VARSITY TENNIS PARTICIPATION (WOMEN)  
1.00 Credit

015 - VARSITY GOLF PARTICIPATION (MEN)  
1.00 Credit

016 - VARSITY SOFTBALL PARTICIPATION  
1.00 Credit

017 - VARSITY BASEBALL PARTICIPATION  
1.00 Credit

018 - VARSITY SWIMMING PARTICIPATION (MEN AND WOMEN)  
1.00 Credit

019 - VARSITY GOLF PARTICIPATION (WOMEN)  
1.00 Credit

021 - WEIGHT TRAINING AND PHYSICAL CONDITIONING  
1.00 Credit
Provide knowledge and skills in various types of weight training and conditioning activities. To provide a knowledge of the Nautilus and Universal equipment. To promote better fitness through weight training activity and exercise. (Fitness)

024 - BEGINNERS GOLF  
1.00 Credit
Only for novice and non-golfers. To learn about the past history of golf, proper etiquette and safety involved, basic fundamentals involved in stance, approach, short, middle and long irons, woods, etc. Also scoring and creating an interest for carry over value. (Fitness)

029 - RACQUETBALL  
1.00 Credit
Only for novice and beginning racquetball players. This course is designed to teach the basic skills and rules of the game so that one can become a competent and active participant, an informed spectator, and involved in an activity that will promote physical fitness. (Lifetime Activities)

030 - BEGINNERS SWIMMING  
1.00 Credit
Designed to teach proper breath control along with the five basic swimming strokes (front crawl, back crawl, breaststroke, sidestroke, and elementary backstroke). Also provides the skills and knowledge for personal survival techniques and basic rescue equipment and usage. Only non-swimmers and those who cannot perform strokes with breath control should register for this course. (Lifetime Activities)

033 - INTERMEDIATE SWIMMING  
1.00 Credit
To perfect the five basic strokes learned in beginners swimming. Develops stroke and breathing efficiency necessary to achieve the physiological benefits of swimming. Further develops rescue and survival skills to ensure the safety of oneself and others. Also teaches basic diving skills. Students registering for the course should be able to pass an entrance skills test consisting of the front crawl, back crawl, breaststroke, sidestroke, and elementary backstroke. (Lifetime Activities)

034 - BOWLING  
1.00 Credit
To offer the student an opportunity to understand the fundamentals of bowling. To teach scoring, etiquette and common courtesies. To provide an appreciation of the sport as a carry-over in their personal lives. (Lifetime Activities)

036 - BEGINNING FITNESS  
1.00 Credit
Development of an individualized low intensity fitness program which best fits the physical and mental needs of each student. Programs will be formulated and monitored by the students and instructor. Activities include aerobic exercise and cardiovascular conditioning. (Fitness)
037 - INTERMEDIATE FITNESS
1.00 Credit
An individualized medium intensity fitness program which best fits the physical and mental needs of each student. Programs will be formulated and monitored by the students and instructor. Activities could include cycling, hydrotherapy (fitness swimming), running and power walking. (Fitness)

038 - ADVANCED FITNESS
1.00 Credit
An individualized high intensity fitness program which best fits the physical and mental needs of each student. Programs will be individually prescribed by the instructor in consultation with students. (Fitness)

040 - BILLIARDS
1.00 Credit
To offer each student the opportunity to learn and participate in the fundamentals of billiards. (Lifetime Activities)

042 - HIKING AND BACKPACKING
1.00 Credit
Hiking and backpacking skills for the beginner; to include information on equipment and safety procedures. Students will be required to make at least one field trip which may require a lab fee. (Lifetime Activities)

045 - RHYTHMIC FUNDAMENTALS
1.00 Credit
Physical activities which can be performed with music or other forms of rhythmic accompaniment. Activities include jump rope, bamboo pole, parachute play, lummi sticks and exercise to music. Particularly beneficial for elementary education majors. Offered odd numbered years. (Lifetime Activities)

047 - SAILING AND SEAMANSHIP
1.00 Credit
The course is taught mostly in the classroom, and lessons in safe boating are included. (Lifetime Activities)

049 - SNOW SKIING
1.00 Credit
Snow skiing for the beginning skier. Course requirements will include basic classroom instruction dealing with equipment, techniques and safety for the beginner. Field trips will be arranged for the application and practice of skiing techniques. A course fee is required to cover lift tickets, travel expenses and rentals. Medical approval and participation waiver may be required. (Lifetime Activities)

050 - SOCIAL DANCE
1.00 Credit
The traditional dance (i.e., waltz, foxtrot, swing, samba, rhumba, cha-cha, tango). An understanding of dances, courtesies of dances, and identification of music for appropriate dances are emphasized. Develops basic knowledge of social dance steps, execution, leading and following. (Lifetime Activities)

052 - CANOEING AND WHITE WATER RAFTING
1.00 Credit
Canoeing and white water rafting skills for the beginner; to include information on equipment and safety procedures. A fee is required to cover travel expenses and rentals. Medical approval and participation waiver may be required. (Lifetime Activities)

060 - ARCHERY
1.00 Credit
The scope and extent of archery, selection of equipment, safety, bracing of the bow, methods of shooting, points of aim, scoring, correction of problems. Use of indoor and outdoor ranges. (Lifetime Activities)

065 - AQUATIC EXERCISE
1.00 Credit
An opportunity is provided for the student to develop an understanding of the benefits of physical fitness concepts through the use of water exercises and to participate in fitness activities in the pool. Student need not be able to swim to participate, but activities will be in the pool. Does not fulfill physical education major’s aquatic requirement. (Fitness)

066 - DANCE AEROBICS
1.00 Credit
An opportunity is provided for students to develop an understanding of and improve their performance level of dance/step aerobic movements to music and to increase the students’ knowledge of cardiovascular intensity levels and mental training needed for a lifetime of fitness. (Fitness)

070 - SELF DEFENSE
1.00 Credit
Self defense maneuvers will enable the student to gain proficiency with fundamental punches, kicks, blocks and counters. An important part of this class is to create an awareness and an appreciation for self defense. (Lifetime Activities)
078 - BADMINTON
1.00 Credit
The game of badminton, knowledge of the rules, history, scoring, and strategies of both singles and doubles play will be emphasized. (Lifetime Activities)

080 - BEGINNING TENNIS
1.00 Credit
Recommended for non-tennis players. The course is designed to develop a basic knowledge of the history, rules, and courtesies of the game of tennis. The fundamental skills of tennis will be presented and practiced. (Lifetime Activities)

083 - SQUARE AND FOLK DANCE
1.00 Credit
The skills in folk and square dance are taught. An understanding of the background and tradition (American and other countries) and an appreciation of folk and square dance are emphasized. A carry over activity for later life. (Lifetime Activities)

086 - VOLLEYBALL
1.00 Credit
The basic skills, strategies and rules of the game of volleyball will be taught. Participation is expected. (Lifetime Activities)

087 - AEROBIC ACTIVITIES
1.00 Credit
To offer each student an understanding of aerobic activities and provide the opportunity to choose an activity to accomplish individual fitness needs. (Fitness)

088 - WEIGHT CONTROL AND NUTRITION
1.00 Credit
Basic nutrition and methods of healthy weight loss which could include prescribed activity. (Wellness)

090 - SPECIAL TOPICS IN HEALTH-PHYSICAL EDUCATION-SPORT STUDIES
1.00 to 4.00 Credits
May be repeated for credit as topic varies.

099 - WELLNESS LAB
1.00 Credit
A clinical experience in the evaluation of one’s wellness status. Participants will test their own individual fitness levels and will be provided the knowledge to develop personalized exercise prescriptions. Wellness counseling will enable students to select those behaviors which are appropriate to a healthy life style. (Wellness)

Subject - Health, Physical Education and Sport Studies (HPES)

000 - ORIENTATION-HEALTH, PHYSICAL EDUCATION, SPORT STUDIES
1.00 Credit

101 - WELLNESS ORIENTATION AND OBSERVATION
1.00 Credit
A minimum of 45 clock hours of experience or observation in an organization, corporation, hospital or agency fitness or health promotion program. Graded S/U.

105 - INTRODUCTION TO WELLNESS
2.00 Credits
Initial professional experience in wellness curriculum and career opportunities available in wellness, health and fitness, and exercise physiology. Principles of nutrition, exercise training, disease prevention and a healthy lifestyle. Permission of departmental chairperson required for non-HPESS majors. Prerequisite: HPESS major or permission of department chairperson.

110 - SCIENTIFIC BASIS OF HEALTH AND FITNESS
4.00 Credits
Basic concepts and components of health and fitness related topics such as activity, disease, nutrition and body composition. Application and assessment of selected physiological and fitness parameters and how these topics can be used to promote a healthy, active lifestyle. Permission of department chairperson required for non-HPESS majors.

111 - PERSONAL HEALTH
4.00 Credits
A theoretical and practical treatment of the concepts of disease prevention and health promotion. Course content includes topics such as emotional health; aging and death; alcohol, tobacco, and drug abuse; physical fitness; nutrition and dieting; consumer health; chronic and communicable diseases; human sexuality; and stress management.
112 - FIRST AID-RESPONDING TO EMERGENCIES
2.00 Credits
Lectures, discussion and practice in the giving of first aid in emergencies. The American Red Cross Certification may be obtained by students who pass an examination. Course can be taken only once for graduation credit. Course may be repeated an unlimited number of times for card renewal as space permits. (Fee)

113 - COMMUNITY CPR
1.00 Credit
Instruct correct techniques in rescue breathing, obstructed airway and CPR for the adult, child and infant. Completion of the course will entitle the student to receive the American Red Cross Community CPR Card. Course can be taken only once for graduation credit. Course may be repeated an unlimited number of times for card renewal as space permits. Graded S/U. (Fee)

114 - LIFEGUARDING
2.00 Credits
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 Lifeguarding certificate/emblem may be obtained by passing an examination. Prerequisite: Instructor approval. (Fee)

115 - WATER SAFETY INSTRUCTION
3.00 Credits
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 4 days per week. Prerequisite: Current certification in advanced lifeguarding. (Fee)

119 - SCHOOL AND COMMUNITY HEALTH
3.00 Credits
Skills and knowledge for aiding teachers and wellness staff to observe and understand the target population 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. Health matters with focus on health problems amenable to community action. Health and physical education majors only or permission of department chair.

132 - GYMNASTICS METHODS - MAJORS
2.00 Credits
The fundamental skills, methods and techniques in teaching the following activities: tumbling, parallel bars, uneven bars, rings, horse, free exercise, balance beam, vaulting and horizontal bar. Offered odd numbered years.

133 - GENERAL METHODS - MAJORS
2.00 Credits
The fundamental skills, methods and techniques of teaching the following activities: track and field, basketball, softball, recreational games.Offered even numbered years.

147 - BASIC MOVEMENT - MAJORS
2.00 Credits
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. Offered even numbered years.

151 - HPE/SPORT STUDIES FOUNDATIONS
4.00 Credits
Introduction to five foundation areas - the historical, philosophical, psychological, physiological and sociological - of physical education, health education, and sport studies. A sixth unit treats scope, justification and needs of the profession and professional opportunities.

153 - INTRODUCTION TO SPORT MANAGEMENT
4.00 Credits
Initial professional experience and preparation to pursue the sport management curriculum with enhanced understanding and insight. The basic concepts in sport management; career preparation, professional opportunities and professional skills. Prerequisite: Sport Management major only or with instructor’s permission.

190 - SPECIAL TOPICS IN HEALTH-PHYSICAL EDUCATION-SPORT STUDIES
1.00 to 4.00 Credits
May be repeated for credit as topic varies.

201 - AIDS AND OTHER SEXUALLY TRANSMITTED DISEASES
3.00 Credits
An introductory, non-technical examination of the biological/medical, social, psychological, and other ethical aspects of AIDS and other sexually transmitted diseases. Topics include but are not limited to: history of STD’s, types, treatment, and prevention of STDs; medical aspects of HIV/AIDS; counseling of AIDS/HIV virus individuals; HIV testing; AIDS education in school systems; religion and AIDS/HIV; minorities/women and AIDS; legal aspects and ethical issues of AIDS/HIV; life with AIDS/HIV (presentation by HIV positive individuals and family members of persons with AIDS).
211 - TEAM SPORTS - MAJORS
2.00 Credits
Skills, methods and techniques in teaching the following activities: speedball, soccer, various versions of touch football, field hockey, and volleyball. Offered odd numbered years.

212 - DANCE - MAJORS
3.00 Credits
The skills and methods of teaching various areas of the dance; folk, square and social dance and rhythmic fundamentals. Offered even numbered years.

213 - INDIVIDUAL-DUAL ACTIVITIES - MAJORS
2.00 Credits
The fundamental skills, methods and techniques in teaching the following activities: tennis, badminton, archery, golf, weight lifting and bowling. Offered odd numbered years.

219 - PSYCHOLOGICAL FACTORS IN DRIVING
3.00 Credits
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: PSYC 100 recommended.

223 - KINESIOLOGY
4.00 Credits
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: BIOL 231 and 232.

233 - PHYSICAL EDUCATION FOR THE ELEMENTARY SCHOOL
4.00 Credits
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.

243 - BASIC ATHLETIC TRAINING
4.00 Credits
A head to toe examination focusing on the initial care and prevention of athletic injuries. Common risk factors and mechanism of athletic injuries will also be identified. Laboratory designed to familiarize the student with taping techniques.

247 - SPORT MARKETING AND PROMOTIONS
4.00 Credits
The practice of marketing, promotions and sales in the sport market place. Introduction to event management, print and broadcast media advertising, marketing strategies, and a group project. Open to sport management majors and others with approval of the instructor. Prerequisites: HPES 153 and sophomore status.

251 - ATHLETIC TRAINING CLINICAL LEVEL 1
1.00 Credit
Involvement in on-campus clinical sport rotation as assigned by the athletic training staff. Under the supervision of an approved clinical instructor, specific clinical proficiencies will be completed. Prerequisites: HPES 112, HPES 243 and admission to the certification track of the athletic training major. Graded S/U. (Formerly HPES 280)

252 - ATHLETIC TRAINING CLINICAL LEVEL 2
1.00 Credit
Involvement in on-campus clinical sport rotation as assigned by the athletic training staff. Under the supervision of an approved clinical instructor, specific clinical proficiencies will be completed. Prerequisite: HPES 251. Graded S/U.

256 - SOCIOLGY/PSYCHOLOGY OF SPORT
4.00 Credits
Significance of sports in society; examination of relationships of sports to other elements of the culture; how sports contribute to human welfare in advanced technological society.

261 - EXERCISE/FITNESS TESTING AND PRESCRIPTION 1
4.00 Credits
The concepts and principles of testing and evaluating fitness levels and the application of those results for the purpose of designing individual exercise prescriptions. Prerequisites: BIOL 231 and HPES 110. BIOL 233 recommended.

262 - EXERCISE/FITNESS TESTING AND PRESCRIPTION 2
4.00 Credits
Measurement and evaluation of basic physiological components of exercise and fitness. The assessment and interpretation of physiological parameters associated with fitness and the application of these results to exercise training and prescription. Prerequisites: HPES 261 and HPESS major or permission of the instructor.

271 - MOTOR LEARNING
2.00 Credits
Provides the future physical educator with opportunities to acquire practical knowledge of the processes and variables that influence the rate, level, and retention of skill acquisition. The student will ultimately be able to develop a sound theoretical basis for instruction, coaching and performance enhancement.
275 - EVALUATION TECHNIQUES IN ATHLETIC TRAINING 1
4.00 Credits
The practical application of the injury evaluation process, incorporating origins, insertions, and innervations of selected muscle groups and manual muscle testing of the upper body, including the head and cervical spine. Also prepares students to make assessments of injuries, and formulate written injury evaluations and SOAP notes for documentation purposes. Prerequisites: BIOL 231; and HPES 251.

276 - EVALUATION TECHNIQUES IN ATHLETIC TRAINING 2
4.00 Credits
Continuation of HPES 275, but focusing on the lower body, with an in-depth look at postural abnormalities and gait analysis. Prerequisite: HPES 275.

290 - SPECIAL TOPICS IN HEALTH-PHYSICAL EDUCATION-SPORT STUDIES
1.00 to 4.00 Credits
May be repeated for credit as topic varies.

300 - HEALTH PROMOTION PRACTICUM
3.00 Credits
An on campus experience designed to give the student practical experience as a health promotion professional under the direct supervision of departmental staff. Experiences will be in the University Wellness program. Prerequisites: AHPE 099; HPES 110, 112, 243 and 261. Permission of department chair required.

303 - ORGANIZATION AND ADMINISTRATION OF HEALTH, PHYSICAL EDUCATION, AND SPORT STUDIES
4.00 Credits
Examination of the philosophy, principles, problems, policies and procedures essential in the organization and administration of meaningful programs in health education, physical education, and sports studies. Prerequisite: HPESS majors only and junior status.

304 - PRACTICAL TECHNIQUES OF TEACHING PHYSICAL EDUCATION 1
1.00 Credit
Required of all physical education majors, preferably in their junior year. Involves assisting in service classes. Permission of department chair required.

305 - PRACTICAL TECHNIQUES OF TEACHING PHYSICAL EDUCATION 2
1.00 Credit
Continuation of HPES 304. Prerequisites: HPES 304 and permission of the department chair.

306 - PRACTICAL TECHNIQUES OF TEACHING PHYSICAL EDUCATION 3
1.00 Credit
Continuation of HPES 304,305. Prerequisites: HPES 304 and 305, and permission of department chairperson required.

308 - TECHNIQUES-COACHING VOLLEYBALL
2.00 Credits
Develops a basic expertise in the techniques and knowledge of coaching volleyball. Provides 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. Offered odd numbered years.

310 - TECHNIQUES-COACHING SOFTBALL
2.00 Credits
Develops a basic expertise in the knowledge and techniques of coaching softball. Provides laboratory experiences in the practical application of techniques and knowledge of coaching softball. Emphasis is on fast pitch. Offered even numbered years.

315 - OFFICIATING-VOLLEYBALL
2.00 Credits
Knowledge and techniques of officiating volleyball. USA and NAGWS rules. Laboratory experiences during class and intramural volleyball. Offered even numbered years. USA and/or NAGWS certification available upon successful completion of course.

317 - THEORY OF TRACK AND FIELD OFFICIATING
2.00 Credits
Knowledge and techniques of officiating track and field. National Federation rules. Laboratory experiences during varsity track and field. Offered odd numbered years.

319 - THEORY AND METHOD OF COACHING TRACK
2.00 Credits
Methods and forms for all of the events in track and field. Lectures, reports, demonstrations and practice. Offered even numbered years.

320 - THEORY OF COACHING AND OFFICIATING WRESTLING
2.00 Credits
Equipment, fundamentals of the art and skill of wrestling. Offered even numbered years.

321 - THEORY OF FOOTBALL COACHING
2.00 Credits
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
2.00 Credits
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. Open to juniors and seniors only or by permission of instructor.

323 - THEORY OF COACHING BASEBALL
2.00 Credits
Individual position and team play in baseball. Lectures, reports, demonstration, and practice.

324 - PSYCHOLOGY OF COACHING
2.00 Credits
The cultural, emotional, psychological and sociological aspects of coaching. Player-coach relationship, understanding the athlete, improving coaching effectiveness. HPESS majors only.

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

334 - ADVANCED COACHING INTERNSHIP-EXTERNSHIP
1.00 to 4.00 Credits
Coaching under supervision in any sport in season. Hours arranged. May be repeated but only six credit hours will count toward graduation. Prerequisite: Permission of department chairperson.

342 - BASKETBALL OFFICIATING
2.00 Credits
Basketball rules and mechanics from the standpoint of player, coach and official. Not for certification. Arrangements can be made if certification is desired.

344 - SPORT MANAGEMENT PRACTICUM-TEAM PROMOTIONS
1.00 Credit
Designed to give Sport Management majors the opportunity to acquire promotional experience through involvement with a sport team at the University. Course can be taken only once for graduation credit. Course can be repeated an unlimited number of times as space permits. Prerequisite: Junior status and permission of department chairperson.

345 - SPORT MANAGEMENT PRACTICUM-FACILITIES MANAGEMENT
1.00 Credit
Designed to give Sport Management majors the opportunity to experience facilities management through involvement with the sports facilities at the University. Course can be taken only once for graduation credit. Course may be repeated an unlimited number of times as space permits. Prerequisite: Junior status and permission of department chairperson.

346 - SPORT MANAGEMENT PRACTICUM-TEAM MANAGEMENT
1.00 Credit
Designed to give Sport Management majors the opportunity to experience administrative management of a sport team at the University. Course can be taken only once for graduation credit. Course may be repeated an unlimited number of times as space permits. Prerequisite: Junior status and permission of department chairperson.

353 - ATHLETIC TRAINING CLINICAL LEVEL 3
1.00 Credit
Involvement in on-campus clinical sport rotation as assigned by the athletic training staff. Under the supervision of an approved clinical instructor, specific clinical proficiencies will be completed. Prerequisite: HPES 252. Graded S/U.

354 - ATHLETIC TRAINING CLINICAL LEVEL 4
1.00 Credit
Involvement in on-campus sport rotation or off-campus clinic site as assigned by the athletic training staff. Under the supervision of an approved clinical instructor, specific clinical proficiencies will be completed. Prerequisite: 353. Graded S/U.

355 - ORGANIZATION & ADMINISTRATION OF HEALTH PROMOTION PROGRAMS
4.00 Credits
A study of the design implementation, organization, administration and evaluation of health promotion programs; consists of competencies and strategies in administrative tasks, programming, facilities, equipment, marketing, sales, finance and liability. Prerequisite: Junior status.

360 - TESTS AND MEASUREMENTS OF HEALTH AND PHYSICAL EDUCATION
4.00 Credits
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. HPESS majors only.
365 - ATHLETICS TESTING PRACTICUM
1.00 Credit
The collection and interpretation of physiological data associated with the training of athletes under the direct supervision of departmental staff. Various athletic populations will be tested for physiological parameters such as aerobic and anaerobic capacities, strength, power, and metabolism. Testing of a variety of athletic teams at Ohio Northern University, providing the opportunity to gain practical athletics testing experience with the athletics population(s) of the student’s choice. Prerequisites: Wellness major, junior status, HPES 262 or permission of the instructor.

367 - BODY COMPOSITION PRACTICUM
1.00 Credit
The collection and interpretation of physiological data associated with body composition under the direct supervision of departmental staff. Body composition as determined by skinfold measurement, hydrostatic weighing, and bio-electrical impedance. Prerequisites: Wellness major, junior status, HPES 261 or permission of the instructor.

369 - HEALTH AND WELLNESS SCREENING PRACTICUM
1.00 Credit
Organizing and conducting health and wellness screenings under the direct supervision of departmental staff. Experiences include health and fitness assessment of body composition, cardiorespiratory fitness, blood profiles and dietary analysis. Prerequisites: Wellness major, sophomore status, AHPE 099, HPES 110 or permission of the instructor.

371 - THERAPEUTIC MODALITIES IN ATHLETIC TRAINING
4.00 Credits
Indications and contraindications of therapeutic modalities in the treatment of athletic injuries as they relate to the healing process. Prerequisites: BIOL 233 and HPES 276.

372 - EXERCISE REHABILITATION IN ATHLETIC TRAINING 1
4.00 Credits
Basic components of a comprehensive rehabilitation program. Selection of therapeutic exercises for injuries/corrective surgeries sustained by the recreational athlete. Discussion will focus on the upper extremities. Prerequisite: HPES 371 and must be an Athletic Training major.

373 - EXERCISE REHABILITATION IN ATHLETIC TRAINING 2
4.00 Credits
Continuation of HPES 372, but focusing on the lower extremities. Covers basic components of a comprehensive rehabilitation program. Prerequisite: HPES 372 and must be an Athletic Training major.

381 - ECG ANALYSIS
2.00 Credits
The cardiac muscle, electrocardiography, ECG analysis and interpretation in the normal and diseased state. The physiological basis of normal and abnormal ECG tracings as they relate to cardiac physiology. Prerequisites: BIOL 233 and permission of instructor for non-wellness majors.

383 - ADULT FITNESS PROGRAM PRACTICUM
1.00 Credit
Comprehensive practical experience working with an adult fitness program under the direct supervision of departmental staff. Practicum is conducted through Ohio Northern University Health and Wellness program. Experiences include client testing, counseling, monitoring, as well as fitness facility management. Prerequisites: Wellness major, junior status, HPES 262 or permission of instructor.

390 - SPECIAL TOPICS IN HEALTH-PHYSICAL EDUCATION-SPORT STUDIES
1.00 to 4.00 Credits
May be repeated for credit as topic varies.

402 - ADAPTIVE AND CORRECTIVE PHYSICAL EDUCATION
4.00 Credits
For the professionals who are concerned with physical activities for people with disabilities; to develop an understanding of the various disabling conditions and to explore methods of adapting physical activities to meet the needs of the atypical student in the physical education class. Prerequisite: HPES 223.

410 - ETHICS IN SPORT
4.00 Credits
Survey, interpretations, and evolution of past and present ethical concepts and value conflicts facing the sport profession. Discussion of ethical theories and issues that arise in sport situations and ways of resolving them. Prerequisite: Junior status.
421 - SPORT LAW
4.00 Credits
Develops an awareness of the complexities concerning sports litigation, primarily in the focus of educational institutions. To use this new knowledge to assist their professional growth in the field. To have a clear understanding of the Law and its fundamental elements. Prerequisite: Junior status.

433 - DRIVER EDUCATION
3.00 Credits
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 DRIVERS-TRAFFIC SAFETY
3.00 Credits
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.

455 - ATHLETIC TRAINING CLINICAL LEVEL 5
1.00 Credit
Involvement in on-campus clinical sport rotation or off-campus site as assigned by the athletic training staff. Under the supervision of an approved clinical instructor, specific clinical proficiencies will be completed. Prerequisite: HPES 354. Graded S/U.

456 - ATHLETIC TRAINING CLINICAL LEVEL 6
1.00 Credit
Involvement in on-campus clinical sport rotation or off-campus clinic site as assigned by the athletic training staff. Under the supervision of an approved clinical instructor, specific clinical proficiencies will be completed. Prerequisite: HPES 455. (Formerly HPES 480).

485 - WELLNESS AND HEALTH PROMOTION INTERNSHIP
3.00 to 15.00 Credits
Participation in a broad based, off-campus experience designed for fitness development or health promotion program under the supervision of the University as well as a worksite supervisor. May be repeated but only 15 credit hours will count toward graduation. Prerequisites: Senior status; 2.00 GPA, 2.50 GPA in major; HPES 355; and permission of the department chairperson required.

486 - SPORT MANAGEMENT INTERNSHIP
1.00 to 15.00 Credits
Specially planned sport management work throughout the quarter to provide direct employment experience. Emphasis is on the practical application of theory and knowledge in developing professional skills. May be repeated but only 15 credit hours will count toward graduation. To be taken with the Sport Management Seminar to assist the students with the integration of field work and classroom learning. Permission of department chairperson required.

487 - HEALTH, PHYSICAL EDUCATION, AND SPORT STUDIES GENERAL INTERNSHIP
4.00 to 16.00 Credits
Participation in a broad based, off-campus experience designed to accommodate students with a departmental major or multiple majors where discipline-specific or combined discipline internships are not offered. Prerequisites: senior status; 2.00 GPA; 2.50 GPA in major(s); and permission of department chairperson. Course may be repeated but only 16 hours will count toward graduation.

490 - SPECIAL TOPICS IN HEALTH-PHYSICAL EDUCATION-SPORT STUDIES
1.00 to 4.00 Credits
May be repeated for credit as topic varies.

494 - HEALTH SEMINAR
3.00 Credits
An in-depth analysis of current health problems, issues and trends as they apply to the teacher of health education.

495 - TRENDS IN ATHLETIC TRAINING
4.00 Credits
Current topical issues affecting the Athletic Training Profession include organization and administration topics, legal issues, and selected health issues that are present in the athletic population. Prerequisites: Junior or senior status and HPES 372 and/or permission of the instructor. Offered odd numbered years.

496 - SPORT MANAGEMENT SEMINAR
1.00 Credit
Discussion and analysis of the field setting, practice and organization. Includes monitoring and evaluation of the internships. To be taken concurrently with Sport Management Internship.

497 - INDEPENDENT STUDY IN HPRESS
1.00 to 4.00 Credits
An in-depth exploration of a subject of special interest. Can be repeated as topic varies. Prerequisite: junior status and written permission from the faculty-mentor, the department chairperson and the Dean of the College prior to registration.
Major in History

Specific requirements for the history major:
HSPS 000 Orientation 1 hour
HIST 110-111 West. Civ. 1 & 2 8 hours
HIST 204 Historiography 4 hours
PLSC 206-207 Am. Gov. 1 & 2 8 hours
HIST 214-215 U.S. History 1 & 2 8 hours
HSPS 222-23 or GEOG 226 One contemporary 4 hours
HIST or
HSPS 488-489 Sr. Research 1 & 2 3 hours
28 hours history electives at 300 or 400 level, distributed as follows:
HIST, HSPS World History 8 hours
HIST, HSPS U.S. History 8 hours
HIST, HSPS Electives 12 hours
AASG 300 Job/Grad Search 1 hour

Minor in History

HIST 110-111 West. Civ. 1 & 2 8 hours
HIST 204 Historiography 4 hours
HIST 214-215 U.S. History 1 & 2 8 hours
HSPS 222-23 or GEOG 226 One contemporary 4 hours
The following must be at the 300 or 400 level:
HIST, HSPS World History 4 hours
HIST, HSPS U.S. History 4 hours
HIST, HSPS Elective 4 hours

Major in Political Science

Specific requirements for the political science major are:
HSPS 000 Orientation 1 hour
PLSC 105 Mod. Pol. Conflicts 4 hours
PLSC 253-254 Research Methods I & II 8 hours
PLSC 206-207 Am. Gov. 1 & 2 8 hours
HIST 214 or 215 U.S. History 1 or 2 4 hours
HSPS 222-23 or 24-25 or GEOG 226 One contemporary 4 hours
HSPS 458 or 459 West. Pol. Thgt. 1 or 2 4 hours
28 hours political science electives at 300 or 400 level, distributed as follows:
PLSC, HSPS American politics 8 hours
PLSC, HSPS World politics 8 hours
PLSC, HSPS Electives 12 hours
AASG 300 Job/Grad Search 1 hour

Minor in Political Science

PLSC 105 Mod. Pol. Conflicts 4 hours
PLSC 253-254 Research Methods I & II 8 hours
PLSC 206-207 Am. Gov. 1 & 2 8 hours
HSPS 222-23 or 24-25 or GEOG 226 One contemporary 4 hours
HSPS 458 or 459 West. Pol. Thgt. 1 or 2 4 hours
The following courses must be at the 300 or 400 level:

- PLSC, HSPS: Am. politics 4 hours
- PLSC, HSPS: World politics 4 hours
- PLSC, HSPS: Elective 4 hours

**Major in Criminal Justice**

Specific requirements for the Criminal Justice major:

- HSPS 000: Orientation 1 hour
- PLSC 121: Intro. to Crim. Justice 4 hours
- PLSC 122: Police in America 4 hours
- PLSC 123: Corrections 4 hours
- PLSC 253-254: Research Methods I & II 8 hours
- PLSC 207: Am. Gov. 2 4 hours
- SOC 261: Criminology 4 hours
- PLSC 342: Criminal Law 4 hours
- PLSC 351: Crim. & Juv. J ust. 4 hours
- PSYC 215, 311, 320, 420, or PSSC 301 8 hours
- HSPS 311, PLSC 207, 230, 255, 366, 391, 491 SOC 240, 243, 246, 247, 351 8 hours
- CRIM. Justice elective 4 hours
- HSPS or PLSC 488-489 Sr. Research 1 & 2 3 hours
- AASG 300: Job/Grad Search 1 hour

**Minor in Criminal Justice**

- PLSC 121: Intro. to Crim. Justice 4 hours
- PLSC 122: Police in America 4 hours
- PLSC 123: Corrections 4 hours
- SOC 261: Criminology 4 hours
- PLSC 342: Judicial Process 4 hours
- SOC 361: Delinquency 4 hours
- Electives: 12 hours

The electives are taken in two of the following disciplines (political science, psychology, and/or sociology) and outside the student's major. These courses must be taken from among those approved for the major. All criminal justice minors must take at least one course in psychology and demonstrate competence in social science methods.

**Major in International Studies**

Core requirements for the International Studies major:

- HSPS 000: Orientation 1 hour
- PLSC 107: Intro to Intl. Studies 4 hours
- HIST 204: Historiography 4 or
- PLSC 253-254: Research Methods I & II 8 hours
- PLSC 222-223: One contemporary 4 hours
- GEOG 226: World Regional Geog. 4 hours
- HIST 384: Modern Europe 2 4 hours
- PLSC 388: Intl. Relations & Law 4 hours
- HSPS 395: Intl. Studies Seminar 4 hours
- HSPS 452: Am. Foreign Relations 4 hours
- HIST, PLSC, or MLNG 200, 300, 400 level (lit. and/or civ. courses) or one substitution with approval of department chair

**Minor in International Studies**

- PLSC 107: Intro. to Intl. Studies 4 hours
- HSPS 222-223: One contemporary 4 hours
- GEOG 226: World Regional Geog. 4 hours
- HIST 384: Modern Europe 2 4 hours
- PLSC 388: Intl. Relations & Law 4 hours
- HSPS 452: Am. Foreign Relations 4 hours
- Electives (3 courses) 12 hours*

The electives are taken in two of the following disciplines (political science, psychology, and/or sociology) and outside the student's major. These courses must be taken from among those approved for the major. All criminal justice minors must take at least one course in psychology and demonstrate competence in social science methods.

**Options**

Options in accounting, business and economics are available to any department major. They are designed to give direction and depth to areas of study related to the major. The courses for the option are in addition to major course work, and the selection of electives must be done in consultation with the student's advisor. See business options under Arts and Sciences description.

**Forensic Science Option in Criminal Justice**

- PLSC: Intro. to Intl. Studies 4 hours
- GEOG 226: World Regional Geog. 4 hours
- HIST 384: Modern Europe 2 4 hours
- PLSC 388: Intl. Relations & Law 4 hours
- HSPS 395: Intl. Studies Seminar 4 hours
- HIST 452: Ottoman Empire 4 hours
- PLSC 475: Model UN 4 hours
- MLNG 200, 300, 400 level (lit. and/or civ. courses) or one substitution with approval of department chair

Cognate: Second-year proficiency in a foreign language

*Electives chosen from the following:
- SOC 250: Cultural Anthro. 4 hours
- PLSC 334: Parliamentary Democ. 4 hours
- PLSC 416: East-Central Europe and Russia 4 hours
- PLSC 336: Devel. Pol. Syst. 4 hours
- SOC 351: World Crim. Justice Syst. 4 hours
- HIST 383: Modern Europe 1 4 hours
- IBEC 385: Int'l Econ. 4 hours
- HSPS 395: Intl Studies Seminar 4 hours
- IBEC 411: Comp. Econ. Syst. 4 hours
- IBEC 442: Econ. Hist. U.S. 4 hours
- HIST 471: Ottoman Empire 4 hours
- PLSC 475: Model UN 4 hours

Options in accounting, business and economics are available to any department major. They are designed to give direction and depth to areas of study related to the major. The courses for the option are in addition to major course work, and the selection of electives must be done in close consultation with the student’s advisor. See business options under Arts and Sciences description.

**Forensic Science Option in Criminal Justice**

- PLSC: Intro Forensic Science 4 hours
- PLSC: Criminal Investigation 4 hours

HISTORY, POLITICAL SCIENCE, AND CRIMINAL JUSTICE 123
Teacher Licensure with Major in Social Studies

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<td>HPS 000</td>
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<td>West. Civ. 1 &amp; 2</td>
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<td>Historiography or Research Methods I &amp; II</td>
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<td>PLSC 107, 222-225</td>
<td>Intro. to Int'l Studies, Contemporary Affairs</td>
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<td>GEOG 226</td>
<td>World Regional Geog.</td>
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<td>SOC 105</td>
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<td>GEOG 237</td>
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Prelaw Program In addition to its emphasis upon prelaw advising, the department cooperates with the Pettit College of Law at Ohio Northern University relative to the formal guaranteed admission prelaw program.

Subject - History (HIST)

110 - WESTERN CIVILIZATION 1
4.00 Credits
Ideas, attitudes, and institutions basic to civilization as it developed in the West from ancient times to the seventeenth century.

111 - WESTERN CIVILIZATION 2
4.00 Credits
Ideas, attitudes, and institutions basic to civilization as it developed in the West from the seventeenth century to the present.

120 - PUBLIC HISTORY
4.00 Credits
The application of history through discussions, demonstrations, readings and fieldwork on a variety of public history topics including museums and historical societies, historic preservation, material culture, popular culture, and family and ethnic group history.

130 - LOCAL HISTORY
4.00 Credits
Significant aspects of local history for reference and teaching purposes. Investigation, examination and study of a variety of topics and trends in local history theory and practice through readings, discussions, demonstrations, and field trips.

190 - SPECIAL TOPICS IN HISTORY
1.00 to 4.00 Credits
Can be repeated as the topic varies.

204 - HISTORIOGRAPHY
4.00 Credits
Western historical thought from the Greeks to the present. Research methods for history majors and minors and social studies majors. Requires a fully documented research paper on an historical topic. Prerequisite: sophomore status.

Subject - Geography (GEOG)

226 - WORLD REGIONAL GEOGRAPHY
4.00 Credits
A regional survey of the non-Western world, including its leading cultural, economic, historical, political and appropriate environmental features. Open to freshmen. Does not satisfy humanities requirement. Formerly HPS 226.

237 - PHYSICAL GEOGRAPHY
4.00 Credits
Basic concepts in physical geography. Topics covered include: the atmosphere, the biosphere, the lithosphere, and the hydrosphere. Emphasis on processes driving physical systems on the earth, interactions among physical systems, human interaction with the physical environment, and understanding the basic physical geographic processes and the global geographic patterns resulting from those processes.

248 - INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEMS
4.00 Credits
The fundamentals of geographic information systems (GIS). Includes basic cartographic principles of map scale, coordinate systems, and map projections, the necessary hardware and software elements used in GIS. Lab exercises in various applications of GIS technology used in environmental science, business, government, and criminal justice. Lecture topics include understanding of GIS terminology, raster and vector data structures, data sources and accuracy, methods of data acquisition, conversion, and input, working with spatial databases and spatial analysis. Does not satisfy Social Science distribution requirement. Prerequisite: working knowledge of Windows operating system.
214 - UNITED STATES HISTORY TO 1865
4.00 Credits
American colonies and United States from 1492 to 1865. Emphasis is placed on the formation of American political, economic, and social attitudes and their application in the early Republic.

215 - UNITED STATES HISTORY SINCE 1865
4.00 Credits
The United States since the Civil War. Major topics include the role played by the US in global affairs and US domestic policy.

290 - SPECIAL TOPICS IN HISTORY
1.00 to 4.00 Credits
Can be repeated as topic varies.

303 - OHIO HISTORY
4.00 Credits
The political and cultural evolution of Ohio from the prehistoric period to the late 19th century. Emphasis placed on the late 18th and early 19th century.

361 - RECENT AMERICAN HISTORY 1
4.00 Credits
The history of the United States from the beginning of World War I until the conclusion of World War II. Formerly HSPS 361.

362 - RECENT AMERICAN HISTORY 2
4.00 Credits
The history of the United States from the conclusion of World War II to the present-day. Formerly HSPS 362.

365 - AFRICAN-AMERICAN HISTORY
4.00 Credits
The essential facts, trends, and interpretations in the history of the African-American from the African beginnings to the present-day.

372 - THE ANCIENT WORLD
4.00 Credits
The political, social, economic, and cultural development of the Near Eastern, Greek, and Roman civilizations of antiquity.

373 - MEDIEVAL EUROPE
4.00 Credits
The political, social, economic, and cultural development of Europe from the decline of the Roman Empire to the beginning of the Renaissance, with special attention to the emergence of institutions that shaped the modern world.

374 - RENAISSANCE AND REFORMATION
4.00 Credits
The evolution of the Italian communes. European cultural movements from the fourteenth through the sixteenth centuries. The Church and European society in the later Middle Ages, the Protestant Reformation, the Catholic Reformation, and the Wars of Religion.

382 - ABSOLUTISM, ENLIGHTENMENT, AND THE FRENCH REVOLUTION
4.00 Credits
European history from the Treaty of Westphalia to the French Revolution. The rise of the modern state, the ancien regime, the origins and nature of the French Revolution, and the coming of Napoleon are stressed. Offered alternate years. Formerly 322, 375 and 376.

383 - HISTORY OF MODERN EUROPE 1
4.00 Credits
European history from 1815 to the era before World War I. This course covers Europe from the age of Reaction and the Romantics to the age of Realism, Naturalism, and Modernism.

384 - HISTORY OF MODERN EUROPE 2
4.00 Credits
European history from the origins of World War I to the collapse of the Soviet Empire and the evolution of the European community.

390 - SPECIAL TOPICS IN HISTORY
1.00 to 4.00 Credits
Can be repeated as topic varies.

415 - RUSSIAN HISTORY TO 1815
4.00 Credits
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, the Time of Troubles, and the Romanov dynasty to 1815. Formerly HSPS 415.

451 - HISTORY OF LAW
4.00 Credits
The evolution of law as an instrument of dispute resolution and social control. The development of the Roman and civil law tradition and the English common law tradition to the seventeenth century.

454 - CIVIL WAR AND RECONSTRUCTION
4.00 Credits
Causes, duration, aftermath, and consequences of the American Civil War.

461 - TOPICS IN NORTH AMERICA TO 1783
4.00 Credits
Included topics such as: Religion in America, the French in North America, the British in North America, Revolutionary America, Race and Gender in America. Formerly HIST 355.
462 - TOPICS IN NORTH AMERICA SINCE 1783
4.00 Credits
Includes topics such as: the Early Republic, Religion in America, the War of 1812, Mid-19th Century Politics in North America, Race and Gender in North America, and Environmental History.

463 - TOPICS IN MODERN EUROPE
4.00 Credits
Topics include but are not limited to World War I, the rise of Fascism, Hitler and Nazism, the European Community, and the European Avant-Garde, Existentialism, Structuralism, Post-Structuralism, Critical Theory and Deconstruction.

471 - HISTORY OF THE OTTOMAN EMPIRE
4.00 Credits
The emergence, expansion and decline of Turkish power in South-Eastern Europe, Asia Minor, the Middle East and North Africa from the time of the Seljuks to the Young Turks, with particular emphasis on this non-Western empire’s military, political and cultural legacy.

481 - PUBLIC SERVICE INTERNSHIP PROGRAM
1.00 to 16.00 Credits
Field experience in the area of public service. Work in a close relationship with public offices and officials. Interns serving in a local agency receive four credit hours for ten hours of service per week. Those who work full-time for a quarter receive 16 credit hours. A maximum of 6 hours will count toward major requirements. Graded S/U. Prerequisites: Consultation with the department internship committee and completion of the application process, a 2.75 GPA, and junior or senior status.

488 - SENIOR RESEARCH PAPER 1
1.00 Credit
Topic selection, development of bibliography and outline for senior paper (See HIST 489) directed by a departmental faculty member. Required of all departmental majors. Students will enroll in this course at least two quarters before the quarter in which they expect to graduate. Prerequisites: Senior status; major in History or International Studies.

489 - SENIOR RESEARCH PAPER 2
2.00 Credits
Writing of a research paper directed by a department faculty member relevant to their major. Required of all departmental majors. Enrollment before the quarter of expected graduation. Prerequisite: HIST 488.

490 - SPECIAL TOPICS IN HISTORY
1.00 to 4.00 Credits
Can be repeated as topic varies.

494 - SEMINAR IN HISTORY
1.00 to 4.00 Credits
Can be repeated as topic varies.

497 - INDEPENDENT STUDY IN HISTORY
1.00 to 4.00 Credits
Approval of department chairman required prior to registration.

Subject - History, Political Science and Criminal Justice (HSPS)

000 - HISTORY AND POLITICAL SCIENCE ORIENTATION
1.00 Credit
Familiarization with the department, requirements for majors, planning a program of courses, the University catalog, careers, the library and university services. Required of majors in history, political science, criminal justice, international studies, and social studies. Graded S/U.

192 - SPECIAL TOPICS - HISTORY AND POLITICAL SCIENCE
1.00 to 4.00 Credits
Can be repeated as the topic varies.

222 - CONTEMPORARY ASIA
4.00 Credits
The ways in which Asia has been shaped through culture, politics, art, religion, economics and family. The primary focus is on events since World War II. Open to freshmen.

223 - CONTEMPORARY AFRICA
4.00 Credits
Political, socioeconomic, and intellectual development of Africa since the conclusion of World War II. Open to freshmen.

224 - CONTEMPORARY MIDDLE EAST
4.00 Credits
The political, socioeconomic and intellectual development of the Middle East since the conclusion of World War II. A survey of the clash of Western and non-Western power centers in the region. Open to freshmen.

225 - CONTEMPORARY LATIN AMERICA
4.00 Credits
Political, economic, social, and cultural development of Latin America. The primary focus is on events since World War II. Open to freshmen.

292 - SPECIAL TOPICS - HISTORY AND POLITICAL SCIENCE
1.00 to 4.00 Credits
Can be repeated as the topic varies.

311 - URBAN HISTORY AND POLITICS
4.00 Credits
The historical development of American cities and the contemporary problems faced by cities and their suburbs.
378 - INTRODUCTION TO CANADIAN STUDIES
4.00 Credits
Canada’s history, politics, geography, environment, economics and literature. Interdisciplinary, team taught. Formerly HSPS 278.

392 - SPECIAL TOPICS - HISTORY AND POLITICAL SCIENCE
1.00 to 4.00 Credits
Can be repeated as the topic varies.

395 - SEMINAR IN INTERNATIONAL STUDIES
4.00 Credits
An in-depth multidisciplinary analysis of a global crisis, an international regional concern, or an issue in global politics. An integrating experience for international studies majors. Focuses on timely or weighty problems in terms of their long-term implications for the international and interstate stability and order of the world. Prerequisite: HIST 204 or PLSC 253 and 254.

452 - AMERICAN FOREIGN RELATIONS
4.00 Credits
An analytical and conceptual overview of the nature of American Foreign Policy decision-making with a use of case studies to uncover the variables at play in recent American Foreign Policy.

458 - WESTERN POLITICAL THOUGHT 1
4.00 Credits
Western political theory commencing with Plato, Aristotle, and the Stoics. Proceeds through Machiavelli and finishes with the Reformation and the wars of religion with an emphasis on their political implications.

459 - WESTERN POLITICAL THOUGHT 2
4.00 Credits
Western political theory commencing with the Enlightenment and ending with John Rawls. Constitutionalism, contract theory, conservatism, idealism, liberalism, utilitarianism, Marxism, anarchism, socialism, feminism, and environmentalism shall be considered.

481 - PUBLIC SERVICE INTERNSHIP
1.00 to 16.00 Credits
Field experience in the area of public service. Work in a close relationship with public offices and officials. Interns serving in a local agency receive four credit hours for ten hours of service per week. Those who work full-time for a quarter receive 16 credit hours. A maximum of 6 hours will count toward major requirements. Graded S/U. Prerequisites: Consultation with the department internship committee and completion of the application process, 2.75 GPA, and junior or senior status.

488 - SENIOR RESEARCH PAPER 1
1.00 Credit
Topic selection, development of bibliography and outline for senior paper (See HPS 489) directed by a departmental faculty member. May be used as a substitute for HIST 488 or PLSC 488 for students completing a dual major within the department. Prerequisites: Senior standing and dual major.

489 - SENIOR RESEARCH PAPER 2
2.00 Credits
Writing of a research paper directed by a department faculty member relevant to their majors. Open to all dual departmental majors. Enrollment before the quarter of expected graduation. Prerequisite: HSPS 488.

492 - SPECIAL TOPICS - HISTORY AND POLITICAL SCIENCE
1.00 to 4.00 Credits
Can be repeated as the topic varies.

Subject - Political Science (PLSC) —

105 - MODERN POLITICAL CONFLICTS AND ISSUES
4.00 Credits
A comparative examination of government structure, political attitudes and relations among nations.

107 - INTERNATIONAL STUDIES AND WORLD PROBLEMS
4.00 Credits
Introduction to the relations of states, governments, political movements and international organizations in the global context, with particular attention on the non-Western world. A survey of the political actors and their objectives in a world of limited resources. Underdevelopment and an ongoing population crisis, with intense competition between the rich and the poor, the major powers and their client states and independence movements. Formerly HSPS 107.

121 - INTRODUCTION TO CRIMINAL JUSTICE
4.00 Credits
Concepts, issues, substance, structures of the American criminal justice system, causes of criminal behavior, theories of law and punishment, and the roles of various actors within the system.

122 - POLICE IN AMERICA
4.00 Credits
Historical, philosophical and legal basis of police institutions, practices and procedures. Issue oriented course and discussion topics will vary with prevailing issues. Formerly PLSC 241.
123 - CORRECTIONS
4.00 Credits
Historical, philosophical and legal basis of correctional procedures and institutions. Issue oriented course and discussion topics will vary with prevailing correctional issues. Formerly PLSC 245.

191 - SPECIAL TOPICS IN POLITICAL SCIENCE
1.00 to 4.00 Credits
Can be repeated as topic varies.

206 - AMERICAN GOVERNMENT 1
4.00 Credits
Foundations of federal and state government and the political behavior of the American people as expressed in political parties, interest groups and elections.

207 - AMERICAN GOVERNMENT 2
4.00 Credits
Institutions of federal and state government and selected areas of domestic public policy.

230 - POVERTY, INEQUALITY AND PUBLIC ISSUES
4.00 Credits
The nature, extent and causes of social mobility in American society, with particular emphasis on poverty, ethnic, racial and gender inequalities in this and other areas of socioeconomic attainment in the United States. The variety of (past, present or future) government actions and/or policies to promote upward mobility and eradicate social inequalities.

253 - RESEARCH METHODS 1: DATA COLLECTION
4.00 Credits
Major research techniques, including participant and non-participant observation, interview, questionnaire, use of available data, and experiment. Other topics include sampling and establishing causality in non-experimental research. Prerequisite: MATH 142. (Also listed as SOC 253.)

254 - RESEARCH METHODS 2: DATA ANALYSIS
4.00 Credits
Empirical concepts and tools for analyzing and explaining political and social phenomena. Hands-on experience in applying and developing concepts and tools for modern qualitative and quantitative analysis. Prerequisite: PLSC 253 or SOC 253. (Also listed as SOC 254.)

291 - SPECIAL TOPICS IN POLITICAL SCIENCE
1.00 to 4.00 Credits
Can be repeated as topic varies.

306 - ENVIRONMENTAL LAW
3.00 Credits
The American legal system as it is used to preserve the nation’s environment. Significant environmental laws and policies developed for implementation. Prerequisites: BIOL 251, CE 323, CE 371 or permission of instructor. Formerly HSPS 306.

334 - PARLIAMENTARY DEMOCRACIES
4.00 Credits
A comparison of the politics of contemporary parliamentary democracies, stressing the impact of political culture and the operations of governmental institutions, parties and interest groups in the process of public policy-making.

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

342 - JUDICIAL PROCESS AND CRIMINAL LAW
4.00 Credits
The roles of lawyers, judges, and juries and the organization and operation of federal and state courts, with special emphasis on criminal law procedure.

347 - POLITICAL PARTIES-INTEREST GROUPS-ELECTIONS
4.00 Credits
The organization and activities of political parties and interest groups and their impact on the political process, especially their roles in election campaigns.

350 - CONSTITUTIONAL LAW AND GOVERNMENT
4.00 Credits
Social and political forces that shaped constitutional political theory and the interaction of law and politics through the Reconstruction era. Relationship of the Supreme Court vis-a-vis Congress, the executive, states, and emergency powers. Formerly HSPS 350.

351 - CONSTITUTIONAL LAW AND CIVIL LIBERTIES
4.00 Credits
Late nineteenth and twentieth century decisions of the Supreme Court with special attention directed to civil liberties, civil rights and criminal justice issues. Formerly HSPS 351.
355 - MINORITIES AND WOMEN IN CRIMINAL JUSTICE
4.00 Credits
The role of minorities and women in the American criminal justice system. Issues relating to minorities and women as offenders, victims of crime, and criminal justice professionals will be presented and explored. Additionally, concepts such as racism, prejudice, discrimination and victimization will be examined. Prerequisite: PLSC 121.

366 - PUBLIC ADMINISTRATION AND POLICY ANALYSIS
4.00 Credits
Bureaucrats as actors in the American political system, their sources of power, their relationship to elected public officials, the basic dynamics and problems in the policymaking process and widely used analytical approaches to public policy.

388 - INTERNATIONAL RELATIONS AND LAW
4.00 Credits
The factors and forces which determine the policies of nation states and the structure, operation and legal setting of international politics. Particular emphasis is on the role of IGO's and NGO's as well as the changing international legal order.

391 - SPECIAL TOPICS IN POLITICAL SCIENCE
1.00 to 4.00 Credits
Can be repeated as topic varies.

416 - EAST CENTRAL EUROPE AND RUSSIA
4.00 Credits
A comparison of the politics of transition between autocratic and democratic political systems in the region formerly dominated by the Soviet Union, traced from Tsarist Russia through the Communist period to present efforts of democratization.

429 - EXECUTIVE PROCESS
4.00 Credits
The historical development and contemporary operation of the presidency and governorships.

430 - LEGISLATIVE PROCESS
4.00 Credits
The structure and operation of Congress and state legislatures.

475 - MODEL UNITED NATIONS
1.00 to 4.00 Credits
Preparation to participate in the National Model United Nations in New York City. An integrated and serious simulation of many aspects of the United Nations. Travel to New York City in the spring. May be repeated up to 12 credit hours, but only a maximum of 4 credit hours can count toward major or minor requirements. Up to 12 hours can fulfill graduation requirements. (Formerly HSPS 475)

476 - MOCK TRIAL
1.00 to 4.00 Credits
Preparation to participate in both the regional and national mock trial competition held at the University of Toledo and Drake University, respectively. Preparation of both civil and criminal cases including opening and closing arguments, direct and cross examination of witnesses, and objections. May be repeated up to 12 credit hours, but only a maximum of 4 credit hours can count toward major or minor requirements. Up to 12 hours can fulfill graduation requirements. Prerequisite: Permission of the instructor. (Formerly HSPS 476)

481 - PUBLIC SERVICE INTERNSHIP PROGRAM
1.00 to 16.00 Credits
Field experience in the area of public service. Work in a close relationship with public offices and officials. Interns serving in a local agency receive four credit hours for ten hours of service per week. Those who work full-time for a quarter receive 16 credit hours. A maximum of 6 hours will count toward major requirements. Graded S/U. Prerequisites: Consultation with the department internship committee and completion of the application process, a 2.75 GPA, and junior or senior status.

488 - SENIOR RESEARCH PAPER 1
1.00 Credit
Topic selection, development of bibliography and outline for senior paper (see PLSC 489) directed by a departmental faculty member. Required of all departmental majors. Enrollment at least two quarters before expected graduation. Prerequisite: Senior status, major in Political Science, Criminal Justice or International Studies.

489 - SENIOR RESEARCH PAPER 2
2.00 Credits
Writing of a research paper directed by a department faculty member relevant to their major. Required of all departmental majors. Enrollment one quarter before expected graduation. Prerequisite: PLSC 488.

491 - SPECIAL TOPICS IN POLITICAL SCIENCE
1.00 to 4.00 Credits
Can be repeated as topic varies.

495 - SEMINAR IN POLITICAL SCIENCE OR CRIMINAL JUSTICE
1.00 to 4.00 Credits
Can be repeated as topic varies.

498 - INDEPENDENT STUDY IN POLITICAL SCIENCE, CRIMINAL JUSTICE OR INTERNATIONAL STUDIES
1.00 to 4.00 Credits
Approval of department chairman required prior to registration.
DEPARTMENT OF MATHEMATICS

Professors Hovis, Lhamon, Putt (Chair); Associate Professors Boyadzhiev, Johns, Retterer, Roepke, Song; Assistant Professor Raiti; Visiting Assistant Professors Dong, Hunt; Lecturer Schroeder

The Mary Reichelderfer Chair in Mathematics and Computer Science was established in 1983 from funds of the estate of Mary K. Werkman. The 1999-2000 recipient of this chair is Danhong Song, associate professor of mathematics.

The department offers majors in mathematics and mathematics/statistics as well as minors in mathematics and applied mathematics. Courses are offered in mathematics and statistics to complement almost all disciplines in the university. Students with a primary major in the department may choose a general education program leading to either the bachelor of arts degree or the bachelor of science degree. In addition, the department cooperates with the Center for Teacher Education in program planning for licensure for those desiring to teach at the secondary school level. The secondary education program in mathematics is nationally accredited by the National Council of Teachers of Mathematics.

Students should consult with the department in which they are considering a major to determine the best choice of courses in mathematics and statistics. In general, the sequence 144-145-146 is designed for students in business administration, 154-155-156-256 for students in pharmacy and life sciences, 163-164-165-263 for students in engineering, physical sciences, mathematics and computer science, 172-173 for prospective early childhood and middle childhood teachers. MATH 142 (Introduction to Statistics) should be of general interest to students in many areas.

MATH 120 and 122 are designed for students who require or desire additional preparation in algebra (120) or trigonometry (122) before enrolling in other required mathematics courses. MATH 160, precalculus, is designed to provide a fast-paced review of the material contained in MATH 120 and 122. The student who needs intensive skill development before taking a calculus course should take 120 and 122; the student needing only a review should take 160.

MATH 105 is designed to meet the needs of students who, although otherwise well-prepared for college work, require remedial work in mathematics before beginning the mathematics required for their chosen major. Because it is a remedial course it carries credit neither toward graduation nor toward any major or minor. It does, however, count in the student’s load, rank and GPA calculation. Entrance into MATH 105 is determined by the departmental placement test. Students whose ACT in mathematics is below 16 (SAT below 370) usually need to take this course before enrolling in any other mathematics course.

All courses in mathematics which are to be counted toward a mathematics department major or minor must be completed with a grade of “C” or better.

Department Co-op Program

Students with a major in the department seeking a co-op experience must enroll in MATH 350 (1 hour). At least sophomore status is required for application for admission into a co-op program. Participation requires junior or senior status. Participants must agree to:

- register for at least 12 hours of course work each term on campus.
- register for MATH 350 for each term at the co-op site.
- maintain an overall grade point average of at least 2.5.
- submit a co-op practicum report to the departmental co-op director during the ninth week of each work term.
- allow release of academic record to co-op employer and prospective employers and to allow the co-op employer to release employment record to Ohio Northern University.
- arrange to meet all deadlines for completion of paperwork normally associated with attendance at Ohio Northern University (e.g. advance registration, grants and loans, etc.)

Certification of completion of the program will appear as a concentration on the transcript. No other courses can be taken while on a co-op experience. Participation in intercollegiate athletic teams is prohibited while on a co-op experience. A minimum of three quarters of work is required for completion of the co-op experience—a maximum of six quarters of work is allowed. Most co-ops will be expected to do six quarters of work. Acceptance into the program is not guaranteed. Once the experience is begun, it can be terminated by the participant, the department, the university, or the employer for any reason. Co-op employers must meet the requirements of the department and the university. Complete details of the co-op program are available in the department office.

Mathematics Major Core

For any major in the department, the student must complete the following core courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 163</td>
<td>Calculus 1</td>
<td>1</td>
</tr>
<tr>
<td>MATH 164</td>
<td>Calculus 2</td>
<td>1</td>
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<tr>
<td>MATH 165</td>
<td>Calculus 3</td>
<td>1</td>
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<tr>
<td>MATH 263</td>
<td>Calculus 4</td>
<td>1</td>
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<tr>
<td>MATH 272</td>
<td>Linear Algebra</td>
<td>1</td>
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<tr>
<td>MATH 294</td>
<td>Foundations of Mathematics</td>
<td>1</td>
</tr>
<tr>
<td>MATH 370</td>
<td>Junior Seminar</td>
<td>1</td>
</tr>
<tr>
<td>MATH 492</td>
<td>Senior Mathematical</td>
<td>1</td>
</tr>
<tr>
<td>MATH 493</td>
<td>Senior Mathematical</td>
<td>1</td>
</tr>
</tbody>
</table>

Exposition 1
Exposition 2
In addition, CS 164 (Programming 1) is a required cognate course.

**Mathematics Major**

In addition to the core requirements listed above, the mathematics major must then complete one of the following two sequences:

*** Track 1 ***

Students planning on graduate study in mathematics should plan on meeting the requirements in this track.

- MATH 275 Differential Equations
- MATH 311 Abstract Algebra 1
- MATH 312 Abstract Algebra 2
- MATH 352 Real Analysis 1
- MATH 353 Real Analysis 2
- MATH 380 Stat for Sci/Eng
- or
- MATH 480 Probability Models
- MATH 3XX Elective
- MATH 3XX Elective

*** Track 2 ***

Students completing this track (including Math 301) will have met the Ohio mathematics requirements for Adolescent Teacher Licensure.

- MATH 245 History of Math
- MATH 301 Math for Sec. Teaching
- or
- MATH 3XX Elective
- MATH 275 Differential Equations
- or
- MATH 332 Operations Research
- MATH 311 Abstract Algebra 1
- MATH 336 Discrete Mathematics
- MATH 352 Real Analysis 1
- MATH 380 Stat for Sci/Eng
- or
- MATH 480 Probability Models
- MATH 421 Foundations of Geometry
- MATH 481 Math Statistics 1
- MATH 482 Math Statistics 2

A MATH/STAT major is strongly encouraged to pursue a minor in an area where statistics has wide applicability. Examples include business, computer science, psychology, technology, biology, environmental studies, and biomedical sciences.

Students interested in a career in Actuarial Science should complete the MATH/STAT major as well as MATH 332, 461, and IBEC 202, 203, ACCT 211, 212, and FINC 362 from the College of Business Administration.

**Mathematics Minor Core**

For any minor in the department, the student must complete the following courses:

- MATH 163 Calculus 1
- MATH 164 Calculus 2
- MATH 165 Calculus 3
- MATH 272 Linear Algebra

**Mathematics Minor**

In addition to the core requirements listed above, the mathematics minor must complete the following courses:

- MATH 294 Foundations of Mathematics
- At least three courses (one of which must be a 300 or 400 level course) selected from MATH 245, 256, 275, 311, 312, 324, 332, 336, 352, 353, 362, 363, 421, 423, 461, 462, 480.

**Applied Mathematics Minor**

In addition to the core requirements listed above, the applied mathematics minor must complete the following courses:

- MATH 263 Calculus 4
- MATH 275 Differential Equations
- At least two courses selected from MATH 332, 336, 362, 363, 461, 462, 480.

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**Subject - Mathematics (MATH)**

000 - ORIENTATION

1.00 Credit

Familiarization with the department, requirements for majors planning programs of study, University catalog and library. Graded S/U.

105 - INTERMEDIATE ALGEBRA

4.00 Credits

Algebraic expressions and operations, equations and problem solving, special products and factoring, linear equations, simultaneous equations, exponents, radicals and graphs. For the student whose score on the mathematics placement exam indicates the need for a review of the fundamentals of algebra. Usually the student whose Math ACT is less that 16 should expect to take this course. CREDIT EARNED IN THIS COURSE DOES NOT SATISFY GRADUATION REQUIREMENTS FOR ANY PROGRAM OFFERED AT THE UNIVERSITY.

120 - COLLEGE ALGEBRA

4.00 Credits

The real number system, polynomials, equations and inequalities, functions and their graphs, polynomial and rational functions, exponential and logarithmic functions. Not open for credit to students who have received a
grade of C or higher in any Calculus course. Prerequisite: Two years of high school algebra and satisfactory performance on the mathematics placement examination.

122 - COLLEGE TRIGONOMETRY
3.00 Credits
Trigonometric functions, identities, solutions of triangles, complex numbers. Not open for credit to students who have received a grade of C or higher in MATH 163 or above. Prerequisite: MATH 120 or its equivalent.

142 - INTRODUCTION TO STATISTICS
4.00 Credits
Describing data (visualization, computation, models), describing relationships (the linear regression model), producing data, probability and sampling distributions, statistical inference. Statistical calculator required. Prerequisite: MATH 105 or its equivalent.

144 - FINITE MATHEMATICS
4.00 Credits
Introduction to and applications of topics from algebra and finite mathematics relevant to business: equations and inequalities, systems of linear equations and matrices, linear programming, mathematics of finance, and game theory. Prerequisite: 2 years of high school algebra.

145 - CALCULUS WITH BUSINESS APPLICATIONS
4.00 Credits
Algebra and calculus as relevant to business: algebraic, exponential, and logarithmic functions and their graphs, differentiation and applications of the derivative, introduction to integration. Prerequisite: MATH 144.

146 - BUSINESS STATISTICS
4.00 Credits
Basic statistical techniques with emphasis on their application in the field of business. Prerequisites: MATH 145 or equivalent.

154 - CALCULUS FOR LIFE SCIENCES 1
4.00 Credits
Concepts of differentiation and integration applied to algebraic, exponential, and logarithmic functions. Prerequisite: MATH 120 or equivalent.

155 - CALCULUS FOR LIFE SCIENCES 2
4.00 Credits
Continuation of MATH 154. Additional topics in integration, functions of several variables, elementary differential equations, and probability. Prerequisite: MATH 154 or equivalent.

156 - BIOSTATISTICS 1
4.00 Credits
Basic statistical techniques with emphasis on applications to Biological and Health Sciences. Prerequisite: MATH 120 or equivalent.

160 - PRE-CALCULUS MATHEMATICS
5.00 Credits
A fast-paced review of algebraic and trigonometric functions, including inverses, graphing, composition, etc. Intended for students requiring review before taking calculus. Not open for credit to students who have received a grade of C or higher in any calculus course or to any student with credit for MATH 120. Prerequisite: Two years of high school algebra and at least one-half year of trigonometry.

163 - CALCULUS 1
5.00 Credits
Limit of a function, continuity, the derivative, extrema, curve plotting, Mean Value Theorem, applications of the derivative. Prerequisite: MATH 160 or equivalent.

164 - CALCULUS 2
4.00 Credits
The Fundamental Theorem of Calculus, applications of the integral, the exponential function and inverse functions, techniques of integration. Prerequisite: MATH 163. (Formerly MATH 261).

165 - CALCULUS 3
4.00 Credits
Sequences and series, Taylor series, polar coordinates, parametric equations, conic sections, vectors, planes and lines in space. Prerequisite: MATH 164. (Formerly MATH 262).

172 - FUNDAMENTAL MATHEMATICS 1
5.00 Credits
Problem solving skills and techniques, elementary set theory, whole numbers, integers, rationals and reals, theory of arithmetic, and introductory number theory. Open only to early and middle childhood education majors.

173 - FUNDAMENTAL MATHEMATICS 2
4.00 Credits
Microsoft Works, fundamentals of counting, probability and statistics. Logo and turtle geometry, geometric figures, measurement, congruence, symmetry, constructions, transformations and similarity. Open only to early and middle education majors.

190 - SPECIAL TOPICS IN MATHEMATICS
1.00 to 5.00 Credits
245 - HISTORY OF MATHEMATICS
4.00 Credits
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. Offered alternate years. Prerequisite: MATH 164.

256 - BIOSTATISTICS 2
4.00 Credits
Review of inferential statistics, analysis of variance, linear and multiple regression and correlation, chi-square distribution, non-parametric statistics. Prerequisite: MATH 156.

263 - CALCULUS 4
4.00 Credits
Vector-valued functions, multivariate functions, spherical and cylindrical coordinates, differential calculus of multivariate functions, integral calculus of multivariate functions. Prerequisite: MATH 165.

272 - INTRODUCTION TO LINEAR ALGEBRA
4.00 Credits
Vector space methods, vector spaces over the real numbers, linear transformations and their matrices, eigenvalues and eigenvectors, applications. Prerequisites: MATH 164 or consent of the instructor.

275 - DIFFERENTIAL EQUATIONS
5.00 Credits
First and second order linear differential equations with applications, Laplace transforms, systems of first order equations. (Formerly MATH 361) Prerequisites: MATH 165 and 272.

290 - SPECIAL TOPICS IN MATHEMATICS
1.00 to 4.00 Credits

294 - FOUNDATIONS OF MATHEMATICS
4.00 Credits
Sets, logic and mathematical proof; application of these concepts. Prerequisite: MATH 164.

301 - MATHEMATICS FOR SECONDARY TEACHERS
4.00 Credits
Enrichment and application topics for secondary school mathematics based on an advanced understanding of mathematics and mathematical proof.

311 - ABSTRACT ALGEBRA 1
4.00 Credits
Algebraic structures, groups, rings and fields. Prerequisite: MATH 294.

312 - ABSTRACT ALGEBRA 2
4.00 Credits
Continuation of MATH 311. Offered as needed.

324 - TOPOLOGY
3.00 Credits
General point set topology and metric spaces. Offered as needed. Prerequisites: MATH 165 and 294.

332 - OPERATIONS RESEARCH
4.00 Credits
Optimal decision making in deterministic systems; linear programming model, simplex method and algorithms, primal and dual problem, sensitivity analysis, transportation and transshipment, assignment, shortest route, minimal spanning tree, maximal flow, PERT, game theory, and non-linear programming. Prerequisite: MATH 272. (Also listed as CS 332.)

336 - DISCRETE MATHEMATICS
4.00 Credits
An introduction to discrete mathematical structures: sets, logic, combinatorics, relations and digraphs, functions, elementary graph theory, partially ordered sets, lattices and Boolean Algebras, Karnaugh maps and simple circuit design. Prerequisite: CS/ECE 164 and MATH 164 or MATH 272.

350 - PROFESSIONAL PRACTICE
1.00 Credit
Cooperative education at an off-campus site. Involvement in full-time work (40 hours per week or more) requiring knowledge and skills in the major. See description of co-op program in department's catalog narrative for details. Prerequisites: Junior status; 2.5 GPA; and acceptance into the Co-op program. Graded S/U.

352 - REAL ANALYSIS 1
4.00 Credits
Mathematical induction, properties of real and rational numbers, sequences, convergence, limits of functions. (Formerly MATH 452.) Prerequisites: MATH 263 and 294.

353 - REAL ANALYSIS 2
4.00 Credits
Continuous functions in real Cartesian spaces, theory of functions of one variable (differentiation and integration). (Formerly MATH 453.) Offered on demand. Prerequisite: MATH 352.

362 - FOURIER ANALYSIS AND PDES
4.00 Credits
Fourier series, fourier integrals, applications, the heat equation, the wave equation, additional methods for solving PDEs. Offered alternate years. Prerequisite: MATH 165.
363 - COMPLEX VARIABLES
4.00 Credits
Complex algebra, complex calculus, analytic functions, infinite series over the complex plane, theory of residues, conformal mapping. Offered alternate years. Prerequisite: MATH 263.

370 - JUNIOR SEMINAR
1.00 Credit
Career options, graduate and professional school options, attendance at departmental seminars and Capstone presentations, mathematics as a computational science, the synergy between mathematics and technology. Prerequisite: Mathematics major with junior standing.

380 - STATISTICS FOR SCIENTISTS AND ENGINEERS
4.00 Credits
Probability and its application to problems in mathematics, science and engineering: random variables and their distributions, estimation, hypothesis testing, linear regression, and analysis of variance. Topics in quality control. Prerequisite: MATH 164.

386 - EXPERIMENTAL DESIGN
4.00 Credits
An introduction to the design and analysis of experiments including comparative designs, block design, factorial design, fractional factorial design, nested and split-plot design and analysis of variance. Students will design and conduct experiments and analyze the resulting data. Statistical software will be used throughout the course. Prerequisite: MATH 256 or 380.

390 - SPECIAL TOPICS IN MATHEMATICS
1.00 to 4.00 Credits

421 - FOUNDATIONS OF GEOMETRY
4.00 Credits
An axiomatic approach to geometry including the concepts of incidence, ordering, separation, and congruence in incidence, affine, Euclidean and non-Euclidean geometries. Prerequisite: MATH 294. Offered alternate years.

423 - PROJECTIVE GEOMETRY
3.00 Credits
Projectivities, perspective triangles, quadrangular sets, harmonic sets, duality, fundamental theorem and Pappus’s Theorem, polarities, the conic, finite projective plane, parallelism, coordinates. Offered as needed. Prerequisite: MATH 294.

461 - NUMERICAL ANALYSIS 1
4.00 Credits
Solutions of equations in one variable, interpolation and polynomial approximation, direct methods for solution of linear systems. Offered alternate years. Prerequisites: CS 165; MATH 165 and 272. (Also listed as CS 461)

462 - NUMERICAL ANALYSIS 2
3.00 Credits
Numerical differentiation and integration, initial value problems for ordinary differential equations, iterative techniques in matrix algebra. Offered alternate years. Prerequisite: MATH 361. (Also listed as CS 462)

480 - PROBABILITY MODELS
4.00 Credits
Axioms of probability theory, discrete and continuous random variables, introduction to stochastic processes. Prerequisite: MATH 263.

481 - MATHEMATICAL STATISTICS 1
4.00 Credits
Probability models, random variables, sampling, estimation, hypothesis testing, non-parametric procedures, regression, and correlation. Prerequisites: MATH 263 and 480.

482 - MATHEMATICAL STATISTICS 2
4.00 Credits
Hypothesis testing, ANOVA, analysis of enumerative data, non-parametric statistics. Prerequisite: MATH 481.

490 - SPECIAL TOPICS IN MATHEMATICS
1.00 to 4.00 Credits

492 - SENIOR MATHEMATICAL EXPOSITION 1
1.00 Credit
The student explores a topic in mathematics with faculty supervision. The student will do research for an expository paper. Graded S/U. Prerequisite: Consent of the instructor or department chairman.

493 - SENIOR MATHEMATICAL EXPOSITION 2
1.00 Credit
Continuation of MATH 492. The student prepares an expository paper and gives a lecture on the paper. Prerequisite: MATH 492.

494 - SEMINAR IN MATHEMATICS
1.00 to 4.00 Credits

497 - INDEPENDENT STUDY IN MATHEMATICS
1.00 to 4.00 Credits
DEPARTMENT OF MODERN LANGUAGES

Professors Davey, Dufault (Chair), Lippert; Associate Professor Walter; Assistant Professor Finn; Visiting Instructor Black; Lecturer Sutherland

The modern language program is designed to train students to speak, understand, read, and write another language; to ensure a strong background in the culture and literature 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 French and Spanish at the elementary and secondary levels.

The university Audio Center provides students with opportunities for language practice and extends contact with the living language. Audio and video materials and interactive computer programs are used as an adjunct to class work and coordinated with class instruction to give students ample opportunity for aural comprehension, audio-visual drill, speaking, and self-correction.

The Elementary French, German and Spanish sequences fulfill the language competency requirement for students enrolled in a Bachelor of Arts degree program.

Students take placement tests to determine their appropriate course level. Placement credit counts toward fulfillment of requirements for language majors and minors, and toward language competency requirements.

Requirements for a non-teacher licensure major in French or Spanish: 52 hours are required beginning with French 120 or Spanish 140; to include eight hours of civilization courses. Ordinarily courses are taken in sequence through French 312 or Spanish 342. Unless otherwise indicated, courses at the 300- and 400-level assume completion of French 310 or 312, or Spanish 342.

Requirements for a teacher-licensure (Ohio) major in French or Spanish: 68 hours are required beginning with French 120 or Spanish 140; to include eight hours of civilization courses and eight hours of literature courses. Ordinarily courses are taken in sequence through French 312 or Spanish 342. Unless otherwise indicated, courses at the 300- and 400-level assume completion of French 310 or 312, or Spanish 342. It is strongly recommended, although not required, that language majors take part in summer-study abroad or junior-year abroad programs. Approved course work completed abroad counts toward requirements for language majors and minors. Students are encouraged to develop a second academic area of interest in addition to their language major.

For a minor in French, German or Spanish: 36 hours are required beginning with French 120, German 130, or Spanish 140.

Business Option for Spanish/French Majors
A student wishing a major in French or Spanish may complete the College of Arts and Sciences business option.

Subject - French (FREN)

1120 - ELEMENTARY FRENCH 1
4.00 Credits
Basic proficiency in understanding, speaking, reading and writing French in everyday situations. Emphasis on comprehenison and speaking. Video, slides, music and other authentic materials illustrate French and francophone ways of life. Four classes per week.

121 - ELEMENTARY FRENCH 2
4.00 Credits
Continuation of FREN 120. Four classes per week. Prerequisite: FREN 120 or proficiency established by placement test.

122 - ELEMENTARY FRENCH 3
4.00 Credits
Continuation of FREN 121. Four classes per week. Prerequisite: FREN 121 or proficiency established by placement test.

214 - INTERMEDIATE FRENCH 1
4.00 Credits
Continued development of proficiency in understanding, speaking, reading and writing French. Emphasis on high-frequency vocabulary and grammatical structures as well as phonetics. Video, slides, music and other authentic materials illustrate language usage and cultural contexts. Four classes per week. Prerequisite: FREN 122 or proficiency established by placement test.

215 - INTERMEDIATE FRENCH 2
4.00 Credits
Continuation of FREN 214. Prerequisite: FREN 214 or proficiency established by placement test.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>216</td>
<td>INTERMEDIATE FRENCH 3</td>
<td>4.00</td>
<td>Continuation of FREN 215. Prerequisite: FREN 215 or proficiency established by placement test.</td>
</tr>
<tr>
<td>219</td>
<td>INTRODUCTION TO FRENCH LITERATURE</td>
<td>4.00</td>
<td>Basic principles of analyzing and appreciating French poetry, prose and theatre. Reading and discussion in French of representative texts. Four classes per week. Prerequisite: FREN 215 and permission of the department.</td>
</tr>
<tr>
<td>297</td>
<td>INDEPENDENT STUDY IN FRENCH</td>
<td>1.00 to 4.00</td>
<td>May be repeated as topic varies.</td>
</tr>
<tr>
<td>307</td>
<td>ADVANCED FRENCH: READING</td>
<td>4.00</td>
<td>Development of reading skills through authentic cultural and literary texts. Vocabulary building. Review of grammar as needed. Prerequisite: FREN 216.</td>
</tr>
<tr>
<td>311</td>
<td>ADVANCED FRENCH: SPEAKING</td>
<td>4.00</td>
<td>Intensive practice of oral communication in conversations, role playing, oral interviews. Oral reports on authentic texts and oral interpretation of dramatic scenes or poetry may be included. Review of phonetic symbols and sounds. Prerequisite: FREN 216.</td>
</tr>
<tr>
<td>312</td>
<td>ADVANCED FRENCH: WRITING</td>
<td>4.00</td>
<td>Intensive writing practice including letters, resumes of interviews and accounts of personal experiences. Written analysis of authentic texts. Vocabulary development. Review of grammar as needed. Prerequisite: FREN 216.</td>
</tr>
<tr>
<td>313</td>
<td>BUSINESS FRENCH</td>
<td>4.00</td>
<td>Development of oral and written proficiency within a business context. Business vocabulary, readings, business and cultural concepts, and situational practice. Assumes mastery of basic French grammar and vocabulary. Prerequisite: FREN 216 and permission of the department.</td>
</tr>
<tr>
<td>315</td>
<td>THE FRENCH TEXT: THE NOVEL</td>
<td>4.00</td>
<td>Reading and discussion in French of representative works in their historical and cultural contexts. Four classes per week. Prerequisite: FREN 310 or 312.</td>
</tr>
<tr>
<td>316</td>
<td>THE FRENCH TEXT: THE ESSAY AND NON-LITERARY TEXTS</td>
<td>4.00</td>
<td>Reading and discussion in French of representative classic authors and texts from contemporary French periodicals. Four classes per week. Prerequisite: FREN 310 or 312.</td>
</tr>
<tr>
<td>319</td>
<td>FRENCH POETRY AND SONG</td>
<td>4.00</td>
<td>Discussion and analysis in French of representative French and francophone works in their historical and cultural contexts. Rules of French versification. Interpretations of poetry into song. Classic and contemporary “chansonniers.” Four classes per week. Prerequisite: FREN 310 or 312.</td>
</tr>
<tr>
<td>324</td>
<td>THE FRENCH FILM</td>
<td>4.00</td>
<td>Viewing of representative films and discussion in French of well-known directors and actors, from the origins of French cinema to the present. Four classes per week. Prerequisite: FREN 216 and permission of the department.</td>
</tr>
<tr>
<td>327</td>
<td>FRENCH CIVILIZATION: CONTEMPORARY FRANCE</td>
<td>4.00</td>
<td>Discussion in French of twentieth century French culture with emphasis on the family, education, employment, politics, technology and cultural values based on videos, readings and other authentic materials. Four classes per week. Prerequisite: FREN 310 or 312.</td>
</tr>
<tr>
<td>328</td>
<td>FRENCH CIVILIZATION: HISTORY OF FRANCE</td>
<td>4.00</td>
<td>Discussion in French of the history, political institutions and artistic expressions of France from their origins to the twentieth century. Films, slides and appropriate texts enhance historical perspectives and emphasize cultural values. Four classes per week. Prerequisite: FREN 310 or 312.</td>
</tr>
<tr>
<td>329</td>
<td>FRENCH CIVILIZATION: FRANCOPHONE CULTURES</td>
<td>4.00</td>
<td>Discussion in French of francophone cultures, emphasizing Quebec and West Africa, in terms of historical perspectives and contemporary concerns. Video, films, slides and appropriate texts illustrate cultural values and provide the basis for discussion. Four classes per week. Prerequisite: FREN 310 or 312. NOTE: Fulfills the non-Western studies requirement.</td>
</tr>
</tbody>
</table>
390 - SPECIAL TOPICS IN FRENCH
1.00 to 4.00 Credits
May be repeated as topic varies. Prerequisite: FREN 310 or 312.

416 - THE FRENCH THEATRE
4.00 Credits
Reading and discussion in French of representative works from the seventeenth century to the present. Recordings, films, and actual performances enhance discussions as available and appropriate. Four classes per week. Prerequisite: FREN 310 or 312.

418 - FRANCOPHONE LITERATURE OF THE TWENTIETH CENTURY
4.00 Credits
Reading and discussion in French of works by contemporary writers in various French-speaking countries. Four classes per week. Prerequisite: FREN 310 or 312.

497 - INDEPENDENT STUDY IN FRENCH
1.00 to 4.00 Credits May be repeated as topic varies.

Subject - German (GRMN)

130 - ELEMENTARY GERMAN 1
4.00 Credits
Basic proficiency in understanding, speaking, reading and writing German in everyday situations. Emphasis on comprehension and speaking. Videos, slides, music and other authentic materials illustrate life in Germany and Austria. Four classes per week.

131 - ELEMENTARY GERMAN 2
4.00 Credits
Continuation of GRMN 130. Four classes per week. Prerequisite: GRMN 130 or proficiency established by placement test.

132 - ELEMENTARY GERMAN 3
4.00 Credits
Continuation of GRMN 131. Four classes per week. Prerequisite: GRMN 131 or proficiency established by placement test.

224 - INTERMEDIATE GERMAN 1
4.00 Credits
Continued development of proficiency in understanding, speaking, reading and writing German. Emphasis on high-frequency vocabulary and grammatical structures, short writing assignments. Authentic materials and videos illustrate language usage and cultural context. Four classes per week. Prerequisite: GRMN 132 or proficiency established by placement test.

225 - INTERMEDIATE GERMAN 2
4.00 Credits
Continuation of GRMN 224. Four classes per week. Prerequisite: GRMN 224 or proficiency established by placement test.

226 - INTERMEDIATE GERMAN 3
4.00 Credits
Continuation of GRMN 225. Four classes per week. Prerequisite: GRMN 225 or proficiency established by placement test.

261 - INTRODUCTION TO GERMAN LITERATURE
4.00 Credits
Basic principles of analyzing and appreciating German essays, short stories, poetry, plays, novellas. Vocabulary building. Reading and discussions in German. Four classes per week. Prerequisite: GRMN 225.

298 - INDEPENDENT STUDY IN GERMAN
1.00 to 4.00 Credits May be repeated as topic varies.

311 - ADVANCED GERMAN 1
4.00 Credits
Intensive practice in using vocabulary and high-frequency grammatical structures. Conversation, discussion, written assignments based on shorter texts, video and audio materials. Four classes per week. Prerequisite: GRMN 226 or permission of instructor.

312 - ADVANCED GERMAN 2
4.00 Credits
Intensive practice in using vocabulary and high-frequency grammatical structures. Conversation, discussion, written assignments based on shorter texts, video, and audio materials. Four classes per week. Prerequisite: GRMN 226 or permission of instructor.

313 - ADVANCED GERMAN 3
4.00 Credits
Intensive practice in using vocabulary and high-frequency grammatical structures. Conversation, discussion, written assignments based on shorter texts, video and audio materials. Four classes per week. Prerequisite: GRMN 226 or permission of instructor.

336 - BUSINESS GERMAN
4.00 Credits
Vocabulary and language structures pertaining to business culture in Germany. Letter and resume writing. Video and authentic materials. Four classes per week. Prerequisite: GRMN 226.
337 - GERMAN CIVILIZATION
4.00 Credits
Political, economic, social and cultural forces in German-speaking Central Europe from the 5th century AD to the present. Discussion in German. Four classes per week. Prerequisite: GRMN 226.

338 - CONTEMPORARY GERMANY AND AUSTRIA
4.00 Credits
German and Austrian culture since the Second World War with emphasis on family, education, employment, politics, technology, and social values based on readings, videos and other materials. Discussion in German. Four classes per week. Prerequisite: GRMN 226.

361 - GERMAN LITERATURE
4.00 Credits
Readings and discussion in German of drama, the Novelle, poetry, the short story. Four classes per week. Prerequisite: GRMN 261 or permission of the department.

391 - SPECIAL TOPICS IN GERMAN
1.00 to 4.00 Credits
May be repeated as topic varies. Prerequisite: GRMN 261 or permission of the department.

498 - INDEPENDENT STUDY IN GERMAN
1.00 to 4.00 Credits
May be repeated as topic varies.

Subject - Modern Languages (MLNG)

111 - JAPANESE
1.00 to 3.00 Credits
Individualized study of modern spoken Japanese. Coverage of material based on number of credits applied for (1-3). Will meet one hour per week with tutor for additional help and practice. Availability may vary from quarter to quarter. Graded S/U. NOTE: This course will not meet the general education language requirement.

112 - WELSH
1.00 to 3.00 Credits
Individualized study of modern spoken Welsh. Coverage of material based on number of credits applied for (1-3). Will meet one hour per week with tutor for additional help and practice. Availability may vary from quarter to quarter. Graded S/U. NOTE: The course will not meet the general education language requirement.

113 - PORTUGUESE (BRAZILIAN)
1.00 to 3.00 Credits
Individualized study of modern spoken Brazilian Portuguese. Coverage of material based on number of credits applied for (1-3). Will meet one hour per week with tutor for additional help and practice. Graded S/U. NOTE: This course will not meet the general education language requirement.

190 - INDIVIDUALIZED LANGUAGE STUDY
1.00 to 3.00 Credits
Individualized study of a modern spoken language for motivated students with a particular interest in or need for study of languages other than French, German, Spanish or Russian. Availability of any given language may vary from quarter to quarter. See department. Coverage of material based on number of credits applied for (1-3). Meets one hour per week with tutor for additional help and practice. Graded S/U. NOTE: These courses will not meet the general education language requirement.

403 - LITERATURE IN TRANSLATION
4.00 Credits
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 language requirement.

Subject - Russian (RUSS)

150 - ELEMENTARY RUSSIAN 1
4.00 Credits
Basic proficiency in understanding, speaking, reading and writing Russian in everyday situations. Emphasis on comprehension and speaking. Authentic materials illustrate life in Russia and the former Soviet Union. Four classes per week.

151 - ELEMENTARY RUSSIAN 2
4.00 Credits
Continuation of RUSS 150. Four classes per week. Prerequisite: RUSS 150 or demonstrated proficiency.

152 - ELEMENTARY RUSSIAN 3
4.00 Credits
Continuation of RUSS 151. Four classes per week. Prerequisite: RUSS 151 or demonstrated proficiency.

296 - INDEPENDENT STUDY IN RUSSIAN
1.00 to 3.00 Credits
May be repeated. Prerequisite: Permission of the department. Graded S/U.
Subject - Spanish (SPAN)

140 - ELEMENTARY SPANISH 1
4.00 Credits
Basic proficiency in understanding, speaking, reading, and writing Spanish with emphasis on listening, speaking, and pronunciation. Videos, slides, music and other authentic materials illustrate Hispanic way of life. Four classes per week.

141 - ELEMENTARY SPANISH 2
4.00 Credits
Continuation of SPAN 140. Four classes per week. Prerequisite: SPAN 140 or proficiency established by placement test.

142 - ELEMENTARY SPANISH 3
4.00 Credits
Continuation of SPAN 141. Four classes per week. Prerequisite: SPAN 141 or proficiency established by placement test.

244 - INTERMEDIATE SPANISH 1
4.00 Credits
Continued development of proficiency in understanding, speaking, reading and writing Spanish with emphasis on pronunciation and speaking. Four classes per week. Prerequisite: SPAN 142 or proficiency established by placement test.

245 - INTERMEDIATE SPANISH 2
4.00 Credits
Continuation of SPAN 244. Four classes per week. Prerequisite: SPAN 244 or proficiency established by placement test.

246 - INTERMEDIATE SPANISH 3
4.00 Credits
Continuation of SPAN 245. Four classes per week. Prerequisite: SPAN 245 or proficiency established by placement test.

247 - INTRODUCTION TO HISPANIC LITERATURE
4.00 Credits
Critical principles in the assessment of prose, fiction, poetry and drama as applied to selected readings in Spanish and Latin American literature. Prerequisite: SPAN 245 and permission of the department.

250 - SPANISH PHONETICS
4.00 Credits
Introduction to linguistic terminology and a comparative analysis of the Spanish and English sound systems, with emphasis on improving students’ pronunciation in Spanish. Prerequisite: SPAN 245 and permission of the department.

299 - INDEPENDENT STUDY IN SPANISH
1.00 to 4.00 Credits
May be repeated as topic varies.

341 - SPANISH CONVERSATION AND COMPOSITION
4.00 Credits
Development of greater proficiency in using vocabulary and grammatical structures through intensive oral and written practice. Prerequisite: SPAN 246.

342 - ADVANCED SPANISH LANGUAGE STUDY
4.00 Credits
Intensive study of grammar and syntax emphasizing high-frequency constructions. Prerequisite: SPAN 246.

343 - BUSINESS SPANISH
4.00 Credits
Development of oral and written proficiency within a business context. Business vocabulary, readings, business and cultural concepts, situational practice and case studies. Prerequisite: SPAN 246.

351 - HISPANIC CULTURAL PERSPECTIVES
4.00 Credits
Contrasts Hispanic and American world views with emphasis on social attitudes and life styles. Prerequisite: SPAN 246 and permission of the department. NOTE: Fulfills the non-Western studies requirement.

353 - SPANISH CIVILIZATION
4.00 Credits
Geographical, political, economic, social and cultural forces in Spain from prehistoric times to the present. Prerequisite: SPAN 246 and permission of the department.

354 - LATIN AMERICAN CIVILIZATION
4.00 Credits
Geography, history and culture of Latin America from Mezoamerica to the present. Prerequisite: SPAN 246 and permission of the department. NOTE: Fulfills the non-Western studies requirement.

356 - SPANISH ART, MUSIC AND DANCE
4.00 Credits
Development of Spanish art, architecture, music and dance from prehistoric times to the present. Prerequisite: SPAN 246 and permission of the department.
357 - LATIN AMERICAN ART, MUSIC AND DANCE
4.00 Credits
Development of Latin American art, architecture, music and dance from Mezoamerica to the present. Prerequisite: SPAN 246 and permission of the department. NOTE: Fulfills the non-Western studies requirement.

360 - HISPANIC MEDIA
4.00 Credits
Contemporary Spanish and Latin American radio, television, newspapers and magazines. Prerequisite: SPAN 246 and permission of the department.

392 - SPECIAL TOPICS IN SPANISH
1.00 to 4.00 Credits
May be repeated as topic varies. Prerequisites: SPAN 246, or SPAN 341 and 342, depending on topic, and permission of the department.

451 - SPANISH LITERATURE TO 1681
4.00 Credits
Works of major Spanish authors from beginnings to Golden Age. Prerequisites: SPAN 341 and 342.

452 - EIGHTEENTH- AND NINETEENTH-CENTURY SPANISH LITERATURE
4.00 Credits
Neoclassicism, Romanticism, Realism and Generation of 1898. Prerequisites: SPAN 341 and 342.

453 - TWENTIETH-CENTURY SPANISH LITERATURE
4.00 Credits
Main currents of Spanish literature from the Generation of 1898 to the present. Prerequisite: SPAN 341 and 342.

456 - NINETEENTH-CENTURY LATIN AMERICAN LITERATURE
4.00 Credits
Romanticism, Realism and Modernism. Prerequisite: SPAN 341 and 342.

457 - TWENTIETH-CENTURY LATIN AMERICAN LITERATURE
4.00 Credits
Main currents from post-Modernism to the present. Prerequisites: SPAN 341 and 342.

499 - INDEPENDENT STUDY IN SPANISH
1.00 to 4.00 Credits
May be repeated as topic varies.

DEPARTMENT OF MUSIC

Professor E. Williams (Chair); Associate Professors Bates, D’Arca, Kratzer, Zank; Assistant Professor Casey; Resident Artists Osbun, R. Williams; Lecturers D. Altstaetter, L. Altstaetter, P. Ashmore, P. L. Ashmore, Dyke, Eichelberger, Ford, Gramm, Grim, Laukhuf, Lincoln, Neoley, Rike, Russell, Sherrick, Simons, Sycks, Zickafoose

The department of music offers a full course of music, music business and music education studies for the aspiring music educator, composer, entrepreneur, 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 an accredited institutional member of the National Association of Schools of Music.

The music major is given a variety of courses and experiences to help him/her gain the knowledge and proficiency in breadth and depth which will help him/her achieve future success in his/her 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, composition, music major: with elective studies in business; and Bachelor of Arts with a major in music. A minor in music is also offered. Specific degree requirements are listed below.

Bachelor of Music

A candidate for the Bachelor of Music degree must complete the following general education requirements:

- MUSC 000 Orientation 1 hr.
- ART 100, ART 105, or equiv. Art, Theater Appreciation 4 hrs.
- COMM 211 or 225 Interpersonal Comm. 4 hrs.
- ENGL 110, 111 Great Works 4 hrs.
- ENGL 204 Writing 1 and 2 8 hrs.
- MLNG 2 qtrs. of one language 8 hrs.
- RELG 105 or equivalent 4 hrs.
- HIST 110, 111 Western Civ. 1 and 2 8 hrs.
- MUSC 200 Non-Western Music 4 hrs.
- Soc. Sciences Economics (Music Majors with Elective Studies in Business take IBEC 202), GEOG 226, Pol. Sci., Psychology (Music Education Majors take PSYC 100) or Sociology 4 hrs.
Math & Mathematics, Biological or Natural Sciences - two courses (Mus. Ed. Majors take MATH 120 or equiv. and one add. course) 8 hrs.

Computer Literacy (Mus. Ed. Majors take CS 130 or equiv.) 4 hrs.

Health Wellness Elective 1 hr.
& P.E. Fitness Elective 1 hr.
Lifetime Activities 1 hr.

Satisfactory participation in the third year assessment program.

All majors include the following basic musicianship and supportive courses:

MUSC 001 Concert and Recital Observation (each qtr.) 0 hrs.
MUSC 100 Music 4 hrs.
MUSC 121, 122, 123 Theory of Music 1, 2, 3 9 hrs.
MUSC 131, 132, 133 Ear Training 1, 2, 3 3 hrs.
MUSC 200 Non-Western Music 4 hrs.
MUSC 221, 222, 223 Advanced Theory of Music 1, 2, 3 9 hrs.
MUSC 231, 232, 233 Adv. Ear Training 1, 2, 3 3 hrs.
MUSC 311 Counterpoint 2 hrs.
MUSC 312 Form and Analysis 2 hrs.
MUSC 313 Orchestration 2 hrs.
MUSC 321, 322, 323 Music History and Literature 1, 2, 3 9 hrs.
MUSC 241 Basic Conducting 2 hrs.
MUSC 342 Advanced Conducting-Instrumental 2 hrs.
MUSC 280 Piano Proficiency 0 hrs.
Must be passed by the end of fall qtr. of the junior year. Private piano is taken until the exam is passed.
MUSC 480 Senior Recital 0 hrs.

For vocal majors only
MUSC 261 Latin/Italian Diction for Singers 1 hr.
MUSC 262 French Diction for Singers 1 hr.
MUSC 263 German Diction for Singers 1 hr.

Bachelor of Music in Music Education Major

MUSC 015-075 Applied Mus.-Major Area 22 hrs.
MUSC 080 or 083 Major Vocal Ensemble (for voice or piano majors) each qtr. 11 hrs.
or MUSC 084, Major Instrumental Ens.
MUSC 087, 090 (for instrumental or piano majors) each qtr. 11 hrs.
MUSC 043 Classroom Instruments 1 hr.
MUSC 334 Woodwind Methods 2 hrs.
MUSC 336 Brass Methods 2 hrs.
MUSC 338 Percussion Methods 2 hrs.
MUSC 339 String Methods 2 hrs.
MUSC 461 Secondary Choral Meth. and Techniques 3 hrs.
MUSC 462 Secondary Instrumental Meth. and Techniques 3 hrs.
MUSC 463 Marching Band Methods and Techniques (instrumental majors only) 2 hrs.
MUSC 010 or 015 Voice Class or Individual 1+ hrs.
MUSC 020 or 025 Piano Class or Individual 1+ hrs.

Guitar Proficiency must be passed before student teaching.

EDUC 115 Culture and Schooling 4 hrs.
EDUC 150 Five day field experience (twice) 0 hrs.
EDUC 210 Exceptional Learner 4 hrs.
EDUC 223 Child Dev. and Psy. 4 hrs.
EDUC 224 Young and Late Adolescent Psy. 4 hrs.
EDUC 285 Curriculum 4 hrs.

Admission to Teacher Education is required for the following courses:

EDUC 320 Instructional Media and Educational Technologies 4 hrs.
EDUC 342 Read. in the Content Area 4 hrs.
EDUC 440 Classroom Strategies 4 hrs.
EDUC 445 Org. and Admin. of Schls. in Am. Society 2 hrs.
EDUC 459 Integrated Music Meth. 4 hrs.
EDUC 470 Student Teaching-Early Childhood 7 hrs.
EDUC 475 Student Teaching Sem. 1 hr.
EDUC 480 Student Teaching-Adolescent 8 hrs.

300 hours of course related field experience

Bachelor of Music in Performance Major

All performance majors must pass a thirty minute recital hearing before being admitted to the program.

MUSC 015-075 Applied Mus.-Major Area 36 hrs.
MUSC 020 or 025 Piano Class or Indv. 1+ hrs.
MUSC 080 or 083 Major Vocal Ensemble (for voice or piano majors) each qtr. 12 hrs.
or MUSC 084, Major Instrumental Ens.

MUSIC 141
MUSC 081, 082, 085, 089 or 099 Minor Vocal Ensemble or
MUSC 088, 092, 094, 095, 096, 098 or 099 Minor Instrumental Ens. 6 hrs.
MUSC 371, 372, 373 Applied Field Lit. and Pedagogy 1, 2, 3 3 hrs.
MUSC 380 Junior Recital 0 hrs.
MUSC Music Electives 5 hrs.
Free Electives 18 hrs.

Bachelor of Music in Composition Major
MUSC 015-075 Applied Music-Primary 12+ hrs. minimum with achievement of junior performance level or continued study until graduation. Applied Music-Sec. 6 hrs.
MUSC 025 Piano Individual 6+ hrs.
MUSC 080, 083, 084, 087, 090, or 096 Major Ensemble each qtr. 12 hrs.
MUSC 211 Electronic Music 2 hrs.
MUSC 314 Music Composition 18 hrs.
MUSC 411 Advanced Electronic Music Composition 2 hrs.
MUSC 497 Independent Study-Senior Composition Proj. 3 hrs.
MUSC Music Electives 4 hrs.
Free Electives 18 hrs.

All composition majors will create a portfolio for periodic review by the music faculty.

Bachelor of Music: Music Major with Elective Studies in Business
MUSC 015-075 Applied Music-Indiv. (major instrument or voice) 24 hrs.
MUSC 080, 083, 084, 087, 090, or 096 Major Ensemble (each qtr.) 12 hrs.
MUSC 025 Piano Individual 1+ hrs.
MUSC 270 Intro. To Mus. Industry 3 hrs.
IBEC 202 Principles of Microeconomics 4 hrs.
IBEC 203 Principles of Macroeconomics 4 hrs.
ACCT 211, 212 Principles of Acct. 1, 2 8 hrs.
MRKT 351 Principles of Marketing 4 hrs.
ABUS 312 Business Law 1 4 hrs.
COMM 380 Arts Administration 4 hrs.
MUSC 470 Music Business Internship 3 hrs.
Two courses selected from the following:
FINC 362 Managerial Finance 4 hrs.
MGMT 325 Employment Law 4 hrs.
MGMT 334 Cases and Exercises in Organizational Behavior 4 hrs.
MGMT 363 Human Res. Management 4 hrs.
MRKT 370 Retailing 4 hrs.
MRKT 371 Personal Selling 4 hrs.
MRKT 372 Advertising 4 hrs.
MUSC Music Electives 5 hrs.
Non-music Electives 14 hrs.

Bachelor of Arts in Music
The candidate for the Bachelor of Arts degree must complete the bachelor of arts general education requirements listed earlier in this catalog.

MUSC 001 Concert and Recital Observation (each qtr.) 0 hrs.
MUSC 100 Music 4 hrs.
MUSC 200 Non-Western Music 4 hrs.
MUSC 121, 122, 123 Music Theory 1, 2, 3 9 hrs.
MUSC 131, 132, 133 Ear Training 1, 2, 3 3 hrs.
MUSC 221, 222, 223 Music 1, 2, 3 9 hrs.
MUSC 231, 232, 233 Advanced Theory of Training 1, 2, 3 3 hrs.
MUSC 321, 322, 323 Music History and Literature 1, 2, 3 9 hrs.
MUSC 020 or Piano Class or 025 Individual 1+ hrs.
MUSC 280 Piano Proficiency 0 hrs.
MUSC 480 or 497 Senior Project/Recital 0-3 hrs.
MUSC 015-075 Major Music-Indiv. Applied Music-Indiv. 12 hrs. (distributed over four yrs.)
MUSC 080 or 083 Major Vocal Ensemble (for voice or piano majors) 6 hrs.
or
MUSC 084, 087, 090 or 096 Major Instrumental Ensemble (for instrumental or piano majors) 6 hrs.
MUSC Music Electives General Stud. Electives 8 hrs. 31 hrs.

A minor in music may be earned by taking a minimum of 39 hours which must include music 121, 122, 123, 131, 132, 321, 322, 323; six quarters of private applied instruction in one area and six quarters in major performing group.

Applied Music Individual instruction is offered for varying hours of credit. Each music major generally takes two or three credit hours of individual instruction in his/her 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 and non-musical theatre majors are assessed an extra fee for individual lessons, and the availability of these lessons is dependent upon the schedule and load of the instructor involved. 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. Requirements in fine arts may be satisfied by two to four years of membership in a major performing group.

*May be repeated on an unlimited basis by music majors, other students must check with their college Dean for specific college requirements.*

### 080 - CHORUS
1.00 Credit
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
1.00 Credit
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 - ADDED ATTRACTION
1.00 Credit
Select show choir of singer/dancers performing characteristic literature including Broadway, pop, vocal jazz and country-western. Performances include concerts on and off campus. Membership by audition.

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

084 - WIND ENSEMBLE
1.00 Credit
A concert ensemble open to qualified students who play band instruments. A wide variety of band literature is studied and performed in regular campus concerts. Membership by audition.

085 - CHAMBER CHORALE
1.00 Credit
A highly select choral ensemble specializing in the study and performance of music of the Renaissance and Baroque periods with the inclusion of both sacred and secular choral masterworks from Madrigals to Cantatas. Prerequisite: Permission of the instructor or audition.

086 - PEP BAND
1.00 Credit
A band specially organized to provide music for athletic events.

087 - SYMPHONIC BAND
1.00 Credit
A 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
1.00 Credit
Selected ensembles for the study and performance of jazz and popular music. Performances on and off campus are scheduled throughout the year. Membership is by audition and priority is given to members of symphonic and concert bands.

089 - OPERA WORKSHOP
1.00 to 3.00
Credits Instruction and experience in preparation for opera performance, including study of operatic literature and coaching of singers for specific roles in public performance of opera scenes and/or full staged operas. Prerequisite: Approval of the instructor or audition.

090 - MARCHING BAND
1.00 Credit
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.

091 - CHAPEL BAND
1.00 Credit
Select ensemble of musicians devoted to the preparation and performance of contemporary instrumental and/or vocal music suitable for a university chapel service.

092 - WOODWIND ENSEMBLE
1.00 Credit
Selected ensembles of woodwind instrumentalists for the study and performance of characteristic literature.

094 - BRASS ENSEMBLE
1.00 Credit
Selected ensembles of brass instrumentalists for the study and performance of characteristic literature.

095 - PERCUSSION ENSEMBLE
1.00 Credit
Selected ensembles of percussionists for the study and performance of characteristic literature.

096 - SYMPHONY ORCHESTRA
1.00 Credit
Credit may be earned for membership by audition in the ONU Symphony and for orchestras on campus which perform for large choral works and musical theatre productions. Permission of instructor is required.

097 - NORTHERNAIRES
1.00 Credit
A highly select vocal jazz quartet with backup instrumental ensemble performing a wide variety of representative music. Performances include concerts both on and off campus. Membership by audition.

098 - STRING ENSEMBLE
1.00 Credit
Ensembles of string instrumentalists for the study and performance of characteristic literature.

099 - NEW MUSIC ENSEMBLE
1.00 Credit
The rehearsal and performance of solo, chamber, and small ensemble music from the twentieth century. In addition, significant experimental music from previous centuries will be included. Emphasis will be on landmark works by major composers, and post-1960 music. Permission of the instructor.
Subject - Music (MUSC)

000 - ORIENTATION
1.00 Credit
Familiarization with the department, departmental technology, requirements for majors, planning programs of courses, university catalog and library. Required of departmental majors. Graded S/U.

001 - CONCERT AND RECITAL OBSERVATION
.00 Credits
A required number of concerts and recitals to be attended each quarter. Required of all full-time music majors. Graded S/U.

100 - MUSIC
4.00 Credits
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 - MAJORS
3.00 Credits
A basic music course for music majors only.

110 - FUNDAMENTALS OF MUSIC FOR THE NON-MUSIC MAJOR
4.00 Credits
Basic components of music. The perception and reading of musical symbols. Includes listening experiences of representative literature and recognition of major composers.

121 - THEORY OF MUSIC 1
3.00 Credits
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 2
3.00 Credits
Continuation of MUSC 121.

123 - THEORY OF MUSIC 3
3.00 Credits
Continuation of MUSC 122.

131 - EAR TRAINING 1
1.00 Credit
Sight-singing; melodic, rhythmic and harmonic dictation; keyboard harmony; conducting; improvisation taught in a laboratory setting. Supplemental and taken in conjunction with first year of music theory studies. Level determined by proficiency.

132 - EAR TRAINING 2
1.00 Credit
Continuation of MUSC 131.

133 - EAR TRAINING 3
1.00 Credit
Continuation of MUSC 132.

190 - SPECIAL TOPICS IN MUSIC
1.00 to 4.00 Credits

200 - NON-WESTERN MUSIC
4.00 Credits
The fundamental concepts of music in any culture with an in-depth exploration of the music of a limited number of non-Western groups. Emphasis on listening and understanding.

210 - JAZZ HISTORY AND LITERATURE
3.00 Credits
Modern jazz, from its roots in African tribal music, through the gradual evolution of this American art form as it appears today.

211 - ELECTRONIC MUSIC
2.00 Credits
History, development, materials, and techniques of electronic music. Emphasis on composition in the medium. Concentration of classical (tape recorder) techniques and use of synthesizer. Work in the electronic laboratory. May be repeated on an unlimited basis by music majors. Prerequisite: Permission of the instructor.

221 - ADVANCED THEORY OF MUSIC 1
3.00 Credits
Continuation of MUSC 123. Study of 18th, 19th and 20th century compositional techniques, orchestration, and counterpoint. Development of analytical skills. Creative projects in composition using computers and other technology at various times throughout the sequence. Continuation courses must be taken in sequence. Prerequisite: MUSC 123.

222 - ADVANCED THEORY OF MUSIC 2
3.00 Credits
Continuation of MUSC 221.

223 - ADVANCED THEORY OF MUSIC 3
3.00 Credits
Continuation of MUSC 222.

231 - ADVANCED EAR TRAINING 1
1.00 Credit
Continuation of MUSC 131, 132 and 133. Supplemental and taken in conjunction with second year of music theory. Elements of traditional improvisation included in the keyboard harmony portion.
232 - ADVANCED EAR TRAINING 2
1.00 Credit
Continuation of MUSC 231.

233 - ADVANCED EAR TRAINING 3
1.00 Credit
Continuation of MUSC 232.

241 - BASIC CONDUCTING
2.00 Credits
General conducting techniques and principles of score study. Laboratory experiences. Continuation courses must be taken in sequence. Prerequisite: MUSC 121.

261 - LATIN AND ITALIAN DICTION FOR SINGERS
1.00 Credit
The proper pronunciation of vocal and choral texts in Latin and Italian. Required of all vocal music majors.

262 - FRENCH DICTION FOR SINGERS
1.00 Credit
Continuation of MUSC 261 in French.

263 - GERMAN DICTION FOR SINGERS
1.00 Credit
Continuation of MUSC 262 in German.

270 - INTRODUCTION TO THE MUSIC INDUSTRY
3.00 Credits
The various elements of the music industry - retailing, marketing, arts management, publishing, manufacturing, recording, unions and licensing. Prerequisite: MUSC 100.

310 - AMERICAN MUSIC
4.00 Credits
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 and stage works of the twentieth century.

311 - COUNTERPOINT
2.00 Credits
Polyphonic music in various styles with particular emphasis on that of the eighteenth century. Creative projects in contrapuntal writing. Prerequisite: MUSC 223.

312 - FORM AND ANALYSIS
2.00 Credits
Musical forms and styles from the Baroque to the present. Theoretical and stylistic analysis of representative music. Prerequisite: MUSC 223.

313 - ORCHESTRATION
2.00 Credits
The instruments of the band and orchestra. Arrangements for the band and orchestra. Arrangements for string, woodwind and brass combinations. Orchestration by classical, romantic, and modern composers. Prerequisite: MUSC 223.

314 - MUSIC COMPOSITION
3.00 Credits
Principles general to all compositional styles, and application of these principles through weekly composition projects. Includes work in the electronic music laboratory. In class performances. May be repeated on an unlimited basis by music majors. Prerequisite: Permission of the instructor.

321 - MUSIC HISTORY AND LITERATURE 1
3.00 Credits
The historical development of music literature. Representative literature and composers: Ancient, Medieval and Renaissance periods. Prerequisite: MUSC 100.

322 - MUSIC HISTORY AND LITERATURE 2
3.00 Credits
Baroque and Classical periods. Prerequisite: MUSC 100.

323 - MUSIC HISTORY AND LITERATURE 3
3.00 Credits
Romantic and Twentieth Century periods. Prerequisite: MUSC 100.

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

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

338 - PERCUSSION METHODS
2.00 Credits
Study, elementary performance skills, pedagogy, and materials of the percussion instruments. For future school music teachers.
339 - STRING METHODS
2.00 Credits
Study, elementary performance skills, pedagogy, and materials of the orchestral stringed instruments. For future school music teachers.

342 - ADVANCED CONDUCTING - INSTRUMENTAL
2.00 Credits
Further development of baton techniques and other conducting skills relating to practice, reading and preparation of scores for working with instrumental ensembles. (Formerly MUSC 242). Prerequisite: MUSC 241.

343 - ADVANCED CONDUCTING - CHORAL
2.00 Credits
Adaptation of basic conducting techniques to the choral ensemble, including leadership, error detection, tonal development, stylistic accuracy and analysis. Exploration of choral philosophy and development. (Formerly MUSC 341.) Prerequisite: MUSC 241.

371 - APPLIED FIELD LITERATURE-PEDAGOGY 1
1.00 Credit
Study of the professional and educational literature in a specific applied field.

372 - APPLIED FIELD LITERATURE-PEDAGOGY 2
1.00 Credit
Continuation of MUSC 371.

373 - APPLIED FIELD LITERATURE-PEDAGOGY 3
1.00 Credit
Continuation of MUSC 372.

380 - JUNIOR RECITAL
.00 Credits
Recital hearing must be passed before approval is granted for performance. Graded S/U.

390 - SPECIAL TOPICS IN MUSIC
1.00 to 4.00 Credits

411 - ADVANCED ELECTRONIC MUSIC COMPOSITION
2.00 Credits
Study and creative work in the area of electronic music. Focuses upon advanced synthesis, recording and notational techniques as they relate to creative efforts. Relevant historical topics and a survey of the electronic music literature will be included. May be repeated on an unlimited basis by music majors.

461 - SECONDARY CHORAL METHODS AND TECHNIQUES
3.00 Credits
Procedures in the development and direction of school choral groups, including choral literature of all types. Includes laboratory experience in teaching vocal techniques in the approximately 20 hours of field experience. Prerequisite: Admission to Teacher Education Program or approval of the director of Teacher Education.

462 - SECONDARY INSTRUMENTAL METHODS AND TECHNIQUES
3.00 Credits
Procedures in the development and direction of school bands and orchestras, including band literature of all types. Includes laboratory experience in teaching beginning instrumental students individually, in small groups and larger classes in the approximately 20 hours of field experience. Prerequisite: Admission to the Teacher Education Program or approval of the director of Teacher Education.

463 - MARCHING BAND METHODS AND TECHNIQUES
2.00 Credits
Methods, materials, and techniques in the development and direction of the marching band. Show planning, precision drill, rehearsal techniques, experience with the latest technology, and selection and rehearsal of music. Membership in Marching Band required in conjunction with the class. Includes approximately 8 hours of field experience.

470 - INTERNSHIP IN MUSIC BUSINESS
3.00 Credits
Professional experience in one area of music business. Application of classroom theory to practice through working in an outside organization or business. Can not be repeated for additional credit. Prerequisites: Completion of all business-related course work and permission of the department chair.

480 - SENIOR RECITAL
.00 Credits
Recital hearing must be passed before approval is granted for performance. Graded S/U.

490 - SPECIAL TOPICS IN MUSIC
1.00 to 4.00 Credits
Group study of approved specialized topics not offered in catalog.

497 - INDEPENDENT STUDY IN MUSIC
1.00 to 4.00 Credits
A wide variety of specialized musical subjects are available through individual study with a faculty member.
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 or religion may choose to major or minor in the department.

General Education Requirements in philosophy or in religion may be met by any course offered in the appropriate discipline (except for Philosophy 234 which does not count toward the philosophy requirement; except for Religion 271, 272, 281, and 282 which do not count toward the religion requirement). 100-level courses are available to all students. 200-level courses require at least sophomore standing or consent of the instructor, and 300- or 400-level courses require at least junior standing or consent of the instructor.

Philosophy Major The major in philosophy requires a minimum of 44 quarter hours beyond Philosophy 100, including the following courses: 234; two of the following (237, 238, 340); two courses in the history of philosophy (102, 331, 343, 371, 374); and either 480 or 483. With departmental approval, a maximum of three courses in religion may be applied to the philosophy major.

Religion Major The major in religion requires a minimum of 44 hours, including the following courses: either 105 or 107; either 109 or 110; either 241 or 264; 325; two additional courses in biblical studies; at least one course in the history of Christian thought (310, 311 or 312); and either 481 or 484. (No more than 12 hours of 100-level courses in religion may count toward the major.) With departmental approval, a maximum of three courses in philosophy may be applied to the religion major.

Philosophy and Religion Major The major in philosophy and religion requires a minimum of 44 quarter hours. Selection of courses is subject to approval by the department and must include 480 or 481 or else 483 or 484.

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

Minor Programs Minors are offered in both philosophy and religion. A minimum of 28 hours is required, with the selection of courses subject to approval by the department. Contact the department chair 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 chair.

Preseminary A faculty member in the department of philosophy and religion serves as advisor to preseminary students in planning a preprofessional program. The recommendations of the American Association of Theological Schools are followed in advising students. A major in the department of philosophy and religion or in another appropriate department may be selected.

Church Vocations Option Designed for students interested in working as lay professionals in the church. One of three emphases may be selected. A core of courses in religion is the basis for each emphasis. Internships in either area churches or the students’ home churches complete the program. Students wishing to enter this program must let the director know no later than the end of their sophomore year.

Religion Core:
- RELG 109 Introduction to the Old Testament, 4 hrs.
- RELG 110 Introduction to the New Testament, 4 hrs.
- RELG 365 Jesus and the Gospels, 4 hrs.
- RELG 410 Church Vocations Internship, 1-4 hrs.
- Two courses outside biblical studies, at least one of which must be in theology, 8 hrs.

A. Financial Management Emphasis:
- IBEC 100 Economics, 4 hrs.
- ACCT 211 Principles of Accounting 1, 4 hrs.
- ACCT 212 Principles of Accounting 2, 4 hrs.
- MGMT 333 Mgmt. & Org. Beh., 4 hrs.

B. Education Emphasis:
- PSYC 100 Psychology, 4 hrs.
- EDUC 223 Child Dev. and Psy, 4 hrs.
- EDUC 224 Young and Late Adolescent Psy., 4 hrs.
- ENGL 225 Children’s and Young Adult Literature, 4 hrs.
- PSSC 301 Social Psychology, 4 hrs.
C. Music Emphasis:
MUSC 081 Chapel Choir, at least 1 hr.
MUSC 035 Organ - Individual, at least 1 hr.
MUSC 121 Theory of Music 1, 3 hrs.
MUSC 122 Theory of Music 2, 3 hrs.
MUSC 123 Theory of Music 3, 3 hrs.
MUSC 131, 132, 133 Ear Training 1-3, 3 hrs. total
MUSC 241 Basic Conducting, 2 hrs.
MUSC 343 Advanced Conducting - Choral, 2 hrs.

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, or theology.

Subject - Philosophy (PHIL)

000 - ORIENTATION
1.00 Credit
Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Graded S/U.

100 - INTRODUCTION TO PHILOSOPHY
4.00 Credits
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.

102 - GREAT PHILOSOPHERS
4.00 Credits
Philosophical inquiry, its scope, methodology, and persistent problems through a study of major philosophers from Bacon to James, including such thinkers as Descartes, Hobbes, Locke, Hume and Kant.

190 - SPECIAL TOPICS IN PHILOSOPHY
1.00 to 4.00 Credits
May be repeated for credit, depending on content.

PREREQUISITE FOR THE COURSES BELOW:
ONE COURSE IN PHILOSOPHY; OR SOPHOMORE STANDING (FOR 200-LEVEL COURSES); OR AT LEAST JUNIOR STANDING (FOR 300 OR 400-LEVEL COURSES); OR CONSENT OF INSTRUCTOR.

234 - LOGIC
4.00 Credits
Logical fallacies and the principles of correct reasoning. The application of formal logical analysis to arguments encountered in ordinary language. WILL NOT SATISFY THE GENERAL EDUCATION REQUIREMENT IN PHILOSOPHY.

237 - KNOWLEDGE AND TRUTH
4.00 Credits
The scope and justification of knowledge with reference to problems such as skepticism, sense perception, reason, belief, and truth.

238 - ETHICS
4.00 Credits
Selected ethical theories and their rational justification. The use of ethical theories for resolving ethical issues in personal and social decision-making.

290 - SPECIAL TOPICS IN PHILOSOPHY
1.00 to 4.00 Credits
May be repeated for credit, depending on content.

310 - ENVIRONMENTAL ETHICS
4.00 Credits
Theories of value, with special emphasis on the possible justification of extending the moral community to include non-human nature. Foci will include: future generations, pollution, the commons, “jobs vs. wilderness”, and legal and moral rights.

320 - SOCIAL JUSTICE
4.00 Credits
Theories of justice in contemporary society, including conceptions of the law, human rights, equality, liberty, and responsibility.

325 - PHILOSOPHY OF RELIGION
4.00 Credits
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, and the relation of faith and reason. (Also listed as RELG 325)
331 - PLATO AND ARISTOTLE
4.00 Credits
The Greek philosophers Plato and Aristotle, against the background of the Pre-Socratics and Socrates.

336 - ETHICS IN PROFESSIONAL LIFE
4.00 Credits
Ethical behavior with emphases on ethical theories and their rational justification, on such problems as relativism and why be moral, and on resolving issues as they arise in case studies from engineering, business, and health care.

340 - THEORIES OF BEING
4.00 Credits
Theories of being with reference to problems such as reality, existence, essence, nature, and their implications for knowledge and values.

341 - AESTHETICS
4.00 Credits
Classical and contemporary theories of art and aesthetic experience. Consideration of the nature of various arts and of issues such as meaning, truth, and value in art.

343 - AMERICAN PHILOSOPHY
4.00 Credits
Main currents in American philosophy, including representative thinkers in such traditions as Puritanism, Transcendentalism, Pragmatism, and Realism.

345 - EXISTENTIALISM
4.00 Credits
The historical roots of existentialism in Kierkegaard and Nietzsche, and the thought of representative writers such as Heidegger, Sartre, Camus, Dostoyevsky and Kafka.

371 - MAJOR PHILOSOPHICAL MOVEMENTS
4.00 Credits
The writings of a major, distinctive philosophical school of thought or period such as Idealism, Utilitarianism, Continental Rationalism, British Empiricism. To be offered every other year or on demand. May be repeated for credit, depending on content.

374 - MAJOR PHILOSOPHERS
4.00 Credits
The thought and important writings of a single philosopher, or a pair or triad of philosophers such as Augustine, Descartes, Mill, Hume and Kant, Hegel and Marx. To be offered every other year or on demand. May be repeated for credit, depending on content.

390 - SPECIAL TOPICS IN PHILOSOPHY
1.00 to 4.00 Credits
May be repeated for credit, depending on content.

394 - SEMINAR IN PHILOSOPHY
1.00 to 4.00 Credits
May be repeated for credit, depending on content.

480 - PHILOSOPHY SENIOR ESSAY
4.00 Credits
A critical essay on a topic selected in consultation with a faculty advisor. Enrollment in the quarter which the paper is to be completed. However, preliminary work on this project commences no later than the beginning of the senior year. (For majors only.)

483 - PHILOSOPHY SENIOR HONORS ESSAY
4.00 Credits
Open to students with at least a 3.5 cumulative GPA in their Philosophy or Philosophy and Religion major. Enrollment in the quarter during which a critical essay is to be completed on a topic selected in consultation with a faculty advisor. However, preliminary work on this project commences no later than the beginning of the senior year.

497 - INDEPENDENT STUDY IN PHILOSOPHY
1.00 to 4.00 Credits
Departmental permission required. May be repeated for credit, depending on content.

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.
<table>
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<tr>
<th>Course Code</th>
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<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>000 - ORIENTATION</td>
<td>1.00 Credit</td>
<td>Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Graded S/U.</td>
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<tr>
<td>105 - RELIGION IN HUMAN LIFE</td>
<td>4.00 Credits</td>
<td>The religious dimension of the human search for personal identity, meaningful existence, and ultimate reality, through the examination of various aspects and expressions of the religious life of humanity.</td>
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<tr>
<td>107 - RELIGIONS EAST AND WEST</td>
<td>4.00 Credits</td>
<td>Representative major religions of the world, their origins, sacred writings, basic beliefs, and life practices, with special attention to non-Western religious traditions.</td>
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<tr>
<td>108 - INTRODUCTION TO CHRISTIANITY</td>
<td>4.00 Credits</td>
<td>The major teachings, practices and institutional forms of Christianity in their historical and contemporary settings.</td>
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<tr>
<td>109 - INTRODUCTION TO THE OLD TESTAMENT</td>
<td>4.00 Credits</td>
<td>Critical reading of the Old Testament (the Hebrew Bible): its historical background, literary features, and theological claims.</td>
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<tr>
<td>110 - INTRODUCTION TO THE NEW TESTAMENT</td>
<td>4.00 Credits</td>
<td>Critical reading of the New Testament: its historical background, literary features, and theological claims.</td>
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PREREQUISITE FOR THE COURSES BELOW: ONE COURSE IN RELIGION; OR SOPHOMORE STANDING (FOR 200-LEVEL COURSES); OR AT LEAST JUNIOR STANDING (FOR 300 OR 400-LEVEL COURSES); OR CONSENT OF INSTRUCTOR.

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<td>210 - WOMEN IN THE BIBLE</td>
<td>4.00 Credits</td>
<td>The portrayal of women in the Old and New Testaments with secondary readings of feminist theory.</td>
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<tr>
<td>231 - RELIGIOUS EXPERIENCE</td>
<td>4.00 Credits</td>
<td>A comparative exploration of diverse encounters with the sacred, as portrayed in literature from around the world. (Also counts as an English literature course.)</td>
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<tr>
<td>241 - ISLAM AND CHRISTIANITY</td>
<td>4.00 Credits</td>
<td>The Islamic and Christian traditions, including the history, theology, and politics of each as well as an exploration of their interactions. Formerly RELG 108 and RELG 266.</td>
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<tr>
<td>243 - THE BIBLE AND THE THIRD WORLD</td>
<td>4.00 Credits</td>
<td>Reading interpretations by Third World authors to learn more about the Bible, the cultures of the Third World, and how one’s social location affects one’s interpretation of texts. Prerequisite: RELG 109 or RELG 110.</td>
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<tr>
<td>263 - CHRISTIAN ETHICS</td>
<td>4.00 Credits</td>
<td>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, and international affairs.</td>
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<tr>
<td>264 - BUDDHISM</td>
<td>4.00 Credits</td>
<td>The ideas and practices of the Buddhist tradition in East and Southeast Asia, with emphasis on the life and teaching of the Buddha and the growth of different forms of Buddhism.</td>
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<tr>
<td>271 - BIBLICAL HEBREW 1</td>
<td>3.00 Credits</td>
<td>Biblical Hebrew with heavy emphasis on grammar and vocabulary. Offered on demand.</td>
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<tr>
<td>272 - BIBLICAL HEBREW 2</td>
<td>3.00 Credits</td>
<td>Continuation of RELG 271. Offered on demand. Prerequisite: RELG 271.</td>
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<tr>
<td>273 - BIBLICAL HEBREW 3</td>
<td>3.00 Credits</td>
<td>Biblical Hebrew with heavy emphasis on readings from the Hebrew Bible. Offered on demand. Prerequisite: RELG 272.</td>
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<tr>
<td>281 - HELLENISTIC GREEK 1</td>
<td>3.00 Credits</td>
<td>Hellenistic Greek with heavy emphasis on grammar, and some readings from the Greek New Testament. Offered on demand.</td>
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</tr>
</tbody>
</table>
282 - HELLENISTIC GREEK 2
3.00 Credits
Hellenistic Greek with heavy emphasis on grammar, and readings from the Greek New Testament. Offered on demand. Prerequisite: RELG 281.

283 - HELLENISTIC GREEK 3
3.00 Credits
Hellenistic Greek with heavy emphasis on grammar, and readings from the Greek New Testament and other early Christian literature. Offered on demand. Prerequisite: RELG 282.

291 - SPECIAL TOPICS IN RELIGION
1.00 to 4.00 Credits
May be repeated for credit, depending on content.

310 - EARLY CHRISTIAN THOUGHT
4.00 Credits
Christian history and theology from the formative period of the Church to the early Middle Ages. Diverse responses to cultural settings and efforts to formulate credal statements. Formerly RELG 346.

311 - MEDIEVAL AND REFORMATION THOUGHT
4.00 Credits
Church history and theology from the High Middle Ages to the beginning of the modern period. Philosophers, theologians, mystics and reformers. Formerly RELG 347.

312 - NINETEENTH AND TWENTIETH CENTURY CHRISTIAN THOUGHT
4.00 Credits
Church history and theology over the past 200 years. Representative thinkers and issues.

320 - LIFE AND TEACHINGS OF ST. PAUL
4.00 Credits
The insights of the most influential thinker and apostle in the early church. Formerly RELG 463.

325 - PHILOSOPHY OF RELIGION
4.00 Credits
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 PHIL 325.)
363 - OLD TESTAMENT PROPHETS  
4.00 Credits  
Critical examination of the prophetic books of the Old Testament from historical, literary and theological perspectives.

365 - JESUS AND THE GOSPELS  
4.00 Credits  

391 - SPECIAL TOPICS IN RELIGION  
1.00 to 4.00 Credits  
May be repeated for credit, depending on content.

410 - CHURCH VOCATIONS INTERNSHIP  
1.00 to 4.00 Credits  
Lay-professional work in any context relevant to the student's selected Church Vocations emphasis (financial management, education, or music) in either a local church or the student's home church. Each credit hour requires 25 hours in internship. Prerequisites: Participation in Church Vocations Option and approval of the Church Vocations Coordinator prior to registration.

481 - RELIGION SENIOR ESSAY  
4.00 Credits  
A critical essay on a topic selected in consultation with a faculty advisor. Enrollment in the quarter during which the paper is to be completed. However, preliminary work on this project commences no later than the beginning of the senior year. (For majors only.)

484 - RELIGION SENIOR HONORS ESSAY  
4.00 Credits  
Open to students with at least a 3.5 cumulative GPA in their Religion or Philosophy and Religion major. Enrollment in the quarter during which a critical essay is to be completed on a topic selected in consultation with a faculty advisor. However, preliminary work on this project commences no later than the beginning of the senior year.

498 - INDEPENDENT STUDY IN RELIGION  
1.00 to 4.00 Credits  
Departmental permission required. May be repeated for credit, depending on content.

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DEPARTMENT OF PHYSICS

Associate Professor Theisen (Interim Chair); Assistant Professors Fisher, Petkie; Visiting Assistant Professor McTaggart.

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 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. Ohio Northern University offers the major in physics with both the bachelor of arts degree and the bachelor of sciences degree.

Physics Department Programs  
Ohio Northern University offers the Physics Major in the traditional track and the modified track, the Physics Minor, the Astronomy Minor, and the Computational Physics Option.

Physics Major  
The traditional track toward the physics major consists of 56 credit hours. The required courses are: Freshman Seminar or Orientation, PHYS 231, 232, 233, 234, 235, 236, 303, 345, 351, 352, 360, 411, 412, and four hours of the Advanced Laboratory, PHYS 300 (maximum 4 hours). Additionally, in consultation with the chair of the department, eight hours of Physics electives must be taken from the 300 level or above. Required cognate courses are MATH 163, 164, 165, 263, 272, and 275. Students desiring graduate study in physics are also encouraged to take MATH 362 and 363.

A modified track toward the physics major consists of 45 credit hours. It is intended for students who are completing the requirements for a second program in addition to the physics major. Examples of this second program include a second major or minor or a program of courses leading to licensure for public school teaching. The required courses for the modified physics track are: PHYS 231 or 211, 232 or 212, 233 or 213, 234, 235, 236, 252 or 253, 303, 345, 351, 411, and two hours of the Advanced Laboratory, PHYS 300 (maximum 4 hours). Additionally, in consultation with the chair of the department, eight hours of physics electives must be taken from the 300 level or above. Required cognates are MATH 163, 164, 165, and one of the following: (i) CHEM 181, 182, 183, (ii) BIOL 121, 122, 123, (iii) CS 164, 165, 166, (iv) completion of a major, minor, or option in another field.

Physics Minor  
The student desiring to complete the requirements for the physics minor must complete 31 credit hours. The required courses are
PHYS 231, 232, 233, 234, 235, 236, 303, and three advanced courses in physics approved by the chair of the physics department. PHYS 211, 212, or 213 may be substituted respectively for PHYS 231, 232, or 233 with additional approved physics courses taken to complete the 31-hour requirement. Substitution of similar courses in other programs for physics courses is listed below.

**Astronomy Minor** The student desiring to complete the requirements for the astronomy minor must complete 31 credit hours. The required courses are PHYS 231, 232, 233, 234, 235, 236, 252, 253, 255, 256, 303, and 371. PHYS 211, 212, or 213 may be substituted respectively for PHYS 231, 232, or 233 with additional approved Physics courses taken to complete the 31-hour requirement.

**Computational Physics Option** The student desiring to complete the requirements for the Computational Physics Option must complete 32 credit hours. The required courses are CS 164, 165, 166, 268, 442, 461, and PHYS 345 and 381.

**Teaching Licensure** The physics department also offers a program leading to licensure for teaching physics in the Ohio public schools. The secondary education program is nationally accredited by the National Science Teachers Association. The program is designed for the student whose goal is to teach physics in the high schools. Due to the nature of the programs permitted by the state of Ohio, the student will also obtain licensure to teach chemistry. Typically, the student will complete the modified track toward the physics major, a minor in chemistry, and a number of hours in the education department specified by state licensure requirements.

**Senior Capstone** The candidate for the Bachelor of Science or the Bachelor of Arts degree with a major in physics will be required to make a presentation describing some experimental project undertaken or some theoretical work pursued. This presentation will serve as a capstone to the work completed as an undergraduate with a major in physics. Some flexibility in this requirement will be permitted, dependent upon the candidate's interests and the facilities available. The presentation will be made during the last quarter of the senior year to the physics faculty, physics majors and any other interested students and faculty. Credit for Physics 490 will indicate that this requirement has been satisfied. This course will be graded on an S/U basis.

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**Substitution of Courses** Substitution for courses specified in the physics major or physics minor may be made with the approval of the chair of the department of physics. Substituted courses may be either internal to the department of physics or external. A maximum of 4 external credit hours may be substituted provided a grade of C or better is earned in the corresponding course. Substitutions which may be allowed are GE 214 for PHYS 351, ECE 331 for PHYS 411, or CHEM 343 for PHYS 432.

Some of the courses listed below contain material which is similar but treated at different levels. Consequently, credit for both Physics 211 and 231, or 212 and 232, or 213 and 233 cannot be given toward satisfying minimum program requirements. Further, the department chair, in consultation with the registrar and dean of the College of Arts and Sciences, will evaluate transcripts from students who transfer to Ohio Northern University with physics courses from other institutions. Suitable credit will be awarded as appropriate.

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**Subject - Physics (PHYS)**

**000 - ORIENTATION**

1.00 Credit

Familiarization with the department, requirements for majors' programs, University catalog and library. Required of departmental majors. AASG 100, Freshman Seminar, may be used to satisfy this requirement. Graded S/U.

**100 - PHYSICS**

4.00 Credits

Elementary presentation of classical mechanics, heat, atomic and nuclear physics. Issues involving science and society will also be considered. Available for credit for non science majors in the College of Arts and Sciences, and students enrolled in the College of Business Administration. In special circumstances, others may enroll with permission of the department chair.

**101 - PHYSICAL AND EARTH SCIENCES-EARLY & MIDDLE CHILDHOOD MAJORS**

4.00 Credits

The first of a three-term integrated sequence of physics, earth, and life science. An investigation of the nature of matter and energy and of their interactions as an introduction to the fundamental principles comprising the disciplines of physics and chemistry. Attention is given to the expression of these principles in everyday experience and technology. Science teaching methods will be included. For early childhood and middle childhood licenses only. Prerequisite: MATH 173.
110 - INTRODUCTION TO PHYSICS
4.00 Credits
Mathematical expression of basic principles and numerical solution of problems chosen from mechanics, waves, heat, electricity, and magnetism. For students who have not had high school physics or who desire additional preparation for PHYS 231-232-233. DOES NOT SATISFY A GENERAL EDUCATION REQUIREMENT AND IT CANNOT BE USED TO SATISFY SPECIFIC DEPARTMENTAL OR PROGRAM REQUIREMENTS. Prerequisites: High school algebra, geometry and trigonometry.

120 - PHYSICS WITH HEALTH SCIENCE APPLICATIONS
4.00 Credits
Selected basic physical principles and their application to health science. Topics include levers and torques, fluid dynamics, electrical conduction, magnetism, optics, and radiation. Offered every term. Prerequisite: High school physics.

211 - GENERAL PHYSICS: MECHANICS OF SOLIDS AND FLUIDS
3.00 Credits
Basic principles of Newtonian mechanics of solids and liquids. The corresponding laboratory is PHYS 234. Offered every year in the Fall Term.

212 - GENERAL PHYSICS: SOUND, HEAT, AND LIGHT
3.00 Credits
Basic principles of sound propagation, heat and heat transfer, and light propagation. The corresponding laboratory is PHYS 235. Offered Winter Term. Prerequisite: PHYS 211 or 231.

213 - GENERAL PHYSICS: ELECTRICITY AND MAGNETISM
3.00 Credits
Basic principles of electrical and magnetic phenomena. The corresponding laboratory is PHYS 236. Offered Spring Term. Prerequisite: PHYS 211 or 231.

231 - PHYSICS: MECHANICS OF SOLIDS AND FLUIDS
4.00 Credits
Basic principles of Newtonian mechanics of solids and fluids employing the differential and integral calculus. The corresponding laboratory course is PHYS 234. Prerequisite: MATH 163.

232 - PHYSICS: HEAT, SOUND, AND LIGHT
4.00 Credits
Basic principles of sound propagation, heat transfer and light propagation. Differential and integral calculus are used. The corresponding laboratory course is PHYS 235. Prerequisites: MATH 163 and PHYS 231.

233 - PHYSICS: ELECTRICITY AND MAGNETISM
4.00 Credits
Basic principles of electrical and magnetic phenomena. Differential and integral calculus are used. The corresponding laboratory course is PHYS 236. Prerequisites: MATH 164 and PHYS 231.

234 - PHYSICS LABORATORY: MECHANICS
1.00 Credit
Experiments in basic Newtonian mechanics. PHYS 211 or 231 should be taken concurrently, or instructor’s permission must be obtained.

235 - PHYSICS LABORATORY: HEAT, SOUND, AND LIGHT
1.00 Credit
Experiments in heat, sound and light. PHYS 212 or 232 should be taken concurrently, or instructor’s permission must be obtained.

236 - PHYSICS LABORATORY: ELECTRICITY AND MAGNETISM
1.00 Credit
Experiments with basic electrical and magnetic phenomena. PHYS 213 or 233 should be taken concurrently or instructor’s permission must be obtained.

252 - EARTH SCIENCE AND PLANETARY ASTRONOMY
4.00 Credits
The fundamentals of astronomy. This will include familiarization with the history of astronomy, the tools of astronomy, basic earth science and an introduction to solar system science. This course was formerly named Astronomy.

253 - STELLAR AND GALACTIC ASTRONOMY
4.00 Credits
Structure, motions and evolution of stars, interstellar material, galaxies and the universe as a whole.

255 - PLANETARY ASTRONOMY LABORATORY
1.00 Credit
Laboratory and mathematical companion to PHYS 252.

256 - STELLAR AND GALACTIC ASTRONOMY LABORATORY
1.00 Credit
Laboratory and mathematical companion to PHYS 253.

290 - SPECIAL TOPICS IN PHYSICS
1.00 to 4.00 Credits

300 - ADVANCED PHYSICS LAB
1.00 to 3.00 Credits
Laboratory projects from Mechanics, Heat, Sound, Light, Nuclear, Solid State Physics chosen to help foster the interests at some intermediate or advanced level. Will substitute for courses PHYS 310, 320, 330 or 340, up to a maximum of 4 credit hours. Prerequisites: PHYS 231, 232, 233, 234, 235 and 236.
303 - MODERN PHYSICS
4.00 Credits
Relativity, quantum and wave mechanics, atomic structure and absorption and emission processes. Prerequisites: MATH 361 and PHYS 233.

345 - MATH METHODS IN PHYSICS
4.00 Credits
Vector algebra, vector calculus in arbitrary coordinate systems, Fourier Analysis, contour integration in complex plane, special functions. Prerequisites: MATH 165 and one year of college level physics.

351 - ANALYTICAL MECHANICS 1
4.00 Credits
Vector analysis, kinematics, conservative forces, planetary motion, pendulum, free and forced oscillations, coupled systems and normal coordinates, angular momentum, rigid bodies. Part of the physics major program and offered when needed. Prerequisites: MATH 361 and PHYS 233.

352 - ANALYTICAL MECHANICS 2
4.00 Credits
LaGrange equations, canonical formulation, principle of least action, normal coordinates, rigid bodies, special relativity, mathematical methods. Part of the Physics major program and offered when needed. Prerequisites: PHYS 351.

353 - NUCLEAR PHYSICS
4.00 Credits
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: PHYS 231, 232, 233, and 303.

360 - QUANTUM MECHANICS
4.00 Credits
Eigenvalues and eigenvectors, commutators, bra-ket notation, postulates of quantum theory, solution of the Schrodinger wave equation for square well potential, harmonic oscillator,

361 - ELECTRONICS
4.00 Credits
Theory of solid state devices, rectifier circuits, transistor amplifiers, oscillators and modulators, instrumentation applications. Offered as needed. Prerequisite: PHYS 213 or 233, 234, 236 and MATH 363.

364 - OPTICS
4.00 Credits
The laws of geometrical and physical optics. Image formation by mirrors and lenses and optical aberrations. Interference and diffraction. Part of the physics major program and offered when needed. Prerequisites: PHYS 231, 232 and 233. Formerly PHYS 363 and 463.

371 - INTRODUCTORY ASTROPHYSICS
4.00 Credits
Motions and physical nature of objects in the solar system, electromagnetic radiation, telescopes and astronomical detectors. Prerequisites: MATH 165, PHYS 231, 232, 233, or permission of the instructor.

375 - PLASMA PHYSICS
4.00 Credits

381 - COMPUTATIONAL PHYSICS
4.00 Credits
Methods and problems in computational physics. CS 461 and PHYS 345 are pre-corequisites.

411 - ELECTRICITY AND MAGNETISM 1
4.00 Credits
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. Part of the Physics major program and offered when needed. Prerequisites: MATH 361 and PHYS 233.

412 - ELECTRICITY AND MAGNETISM 2
4.00 Credits
Advanced electric and magnetic fields; electric and magnetic properties of solids, electromagnetic radiation. Part of the Physics major program and offered when needed. Prerequisites: MATH 362 and PHYS 411.
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 and Sociology
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. Detailed information appears on page 33 of this catalog.

The program requires specially selected electives. Specific curricular requirements are available from the department chair.

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 (except for 100,105)
10’s, 20’s, 30’s—psychology
40’s, 50’s, 60’s—sociology
90’s—special topics, independent study
Examples:
141—1st year, sociology
335—3rd year, psychology

Field Work, Externships and 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.
100 - PSYCHOLOGY  
4.00 Credits  
General research and concepts in human behavior. Lectures, demonstrations, and observations.

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

210 - EXPERIMENTAL PSYCHOLOGY 1  
4.00 Credits  
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: MATH 142 and PSYC 100 and 111.

211 - EXPERIMENTAL PSYCHOLOGY 2  
4.00 Credits  
Continuation of PSYC 210.

212 - PRINCIPLES OF BEHAVIOR MANAGEMENT  
4.00 Credits  
The theory and supporting research which underlie behavior modification. Taught through lecture and laboratory demonstrations. Prerequisite: PSYC 100.

215 - DEVELOPMENTAL PSYCHOLOGY  
4.00 Credits  
Basic theories in human development from conception through old age; contemporary research at each age level. Prerequisite: PSYC 100.

218 - PSYCHOLOGY OF THE EXCEPTIONAL CHILD  
4.00 Credits  
The atypical child. Diagnosis and treatment of disorders of infancy, childhood and adolescence. Prerequisite: PSYC 100.

226 - HUMAN SEXUAL BEHAVIOR  
4.00 Credits  
Use of research literature in an attempt to provide an understanding of what is known (as well as what is not known) about the major facets of human sexual behavior. Prerequisite: PSYC 100.

290 - SPECIAL TOPICS IN PSYCHOLOGY  
1.00 to 4.00 Credits

311 - PSYCHOLOGY OF PERSONALITY  
4.00 Credits  
The major theories of personality from Freud to contemporary theoretical approaches. Prerequisite: PSYC 100.

312 - PSYCHOLOGICAL ASSESSMENT  
4.00 Credits  
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: PSYC 100.

315 - LEARNING THEORY AND RESEARCH  
4.00 Credits  
The major theories of learning and major empirical issues and findings related to classical and instrumental conditioning. Current research in learning is covered on both the animal and human level.

320 - PSYCHOLOGY AND THE LAW  
4.00 Credits  
A review of the role of the psychologist in civil commitment procedures, the insanity defense, patient's rights, the determination of competency, and testifying as an expert witness. An examination of: significant court cases involving psychology and the law, research in the areas of jury selection, eye witness testimony and psychologists' licensing procedures. Prerequisite: PSYC 100.

335 - PHYSIOLOGICAL PSYCHOLOGY  
4.00 Credits  
Psychology as a biological science. Physiological events underlying behavior, including sensory, neural, and glandular involvement in such topics as motivation, emotion, and learning. Prerequisite: PSYC 100 and BIOL 231 or 331.

390 - SPECIAL TOPICS IN PSYCHOLOGY  
1.00 to 4.00 Credits

394 - JUNIOR SEMINAR  
1.00 Credit  
A professional preparation seminar for psychology majors. Discussion of career options, graduate school admissions, resume writing, placement services, GRE, practicum and other topics of importance in the senior year. Prerequisites: Junior status; only psychology majors.
420 - ABNORMAL PSYCHOLOGY
4.00 Credits
The development of a scientific approach to abnormal behavior. A review of the psychological, sociological, and biological factors related to the development of abnormal behavior. A review of the research of, the causal factors related to, and the diagnosis and treatment of mental disorders and mental retardation. Prerequisite: PSYC 100.

426 - PRACTICUM IN PSYCHOLOGY
12.00 to 16.00 Credits
A field experience in the area of psychology. Open to seniors. Only 8 credits may apply to the major. Prerequisite: Approval of chairman.

434 - HISTORY AND SYSTEMS OF PSYCHOLOGY
4.00 Credits
An overview of the major lines of thinking which have influenced the field of psychology beginning with ancient Greek philosopher-scientists to the twentieth century. Emphasis is given to theories of Empiricism, Associationism, and Scientific Materialism as well as twentieth century schools of psychological thought. Prerequisite: PSYC 100.

497 - INDEPENDENT STUDY IN PSYCHOLOGY
1.00 to 4.00 Credits
Prerequisite: Approval of chairman.

**Sociology**

A major in sociology consists of the following requirements:
1. Sociology 000
2. Sociology 105
3. Sociology 253
4. Sociology 254
5. Sociology 446
6. Sociology 447
7. Math 142
8. 28 hours of sociology electives

A minor in sociology consists of the following requirements:
1. Sociology 105
2. Sociology 253
3. Sociology 254
4. Sociology 446 or Sociology 447
5. Math 142
6. Additional sociology courses totaling 16 hours, selected in consultation with a member of the sociology faculty.

Psi Sigma is a student organization open to all students with an interest in either psychology or sociology. The club sponsors field trips, speakers, and social activities.

**Subject - Sociology (SOC)**

000 - ORIENTATION
1.00 Credit
Familiarization with the department, requirements for majors, planning program of courses, University catalog and library. Graded S/U.

105 - SOCIOLOGY
4.00 Credits
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.

240 - MARRIAGE AND FAMILY
4.00 Credits
Historical, cross cultural, and analytical study of family with emphasis on ideology and the effects of social structures and agencies on family composition and roles. Prerequisite: SOC 105.

243 - SOCIAL DEVIANCE 1
4.00 Credits
Sociological perspectives on the processes of individual and group deviance. An examination of how deviant behavior is defined, how the definitions are maintained, and how the violators are processed. Theory and research regarding specific classes of deviants are explored, and current public policy issues concerning deviants are discussed. Prerequisite: SOC 105.

246 - ORGANIZATIONS AND WORK
4.00 Credits
The nature of work and organizations from a sociological perspective. The history of work, job satisfaction, and the nature of work in contemporary society are examined. The structure of complex organizations is analyzed, focusing on dimensions of organizations, formalization, power and authority, conflict and change, communications, and the external environment. Prerequisite: SOC 105. (Formerly SOC 245)

247 - SOCIAL STRATIFICATION
4.00 Credits
The origins, institutionalization and change of class, status, prestige, power, and other forms of social inequality with attention to the effects of stratification on the individual. Prerequisite: SOC 105. Offered odd years. Formerly titled Social Inequality.

250 - CULTURAL ANTHROPOLOGY
4.00 Credits
The major concepts and principles of cultural anthropology, emphasizing the understanding of the total configuration and interrelationships.
of culture traits, complexes, and social relationships in a particular geographic environment and historical context. Prerequisite: SOC 105.

253 - RESEARCH METHODS 1: DATA COLLECTION
4.00 Credits
Major research techniques, including participant and non-participant observation, interview, questionnaire, use of available data, and experiment. Other topics include sampling and establishing causality in non-experimental research. Prerequisite: MATH 142. (Also listed as PLSC 253.)

254 - RESEARCH METHODS 2: DATA ANALYSIS
4.00 Credits
Empirical concepts and tools for analyzing and explaining political and social phenomena. Hands-on experience in applying and developing concepts and tools for modern qualitative and quantitative analysis. Prerequisite: PLSC 253 or SOC 253. (Also listed as PLSC 254.)

260 - SOCIAL PROBLEMS
4.00 Credits
Sociological perspectives on contemporary social problems including racism, sexism, crime, drug and alcohol abuse, suicide, poverty, homelessness, domestic violence, problems in the education system, urbanization, and environmental destruction. Prerequisite: SOC 105.

261 - CRIMINOLOGY
4.00 Credits
The nature and extent of crime, development of criminological theory, major forms of criminal behavior, and society’s attempts at prevention and control of crime. The major perspectives, issues and diverse concerns that characterize contemporary criminology are presented. Prerequisite: SOC 105.

263 - VICTIMOLOGY
4.00 Credits
The history of victimology, patterns of victimization, the role of the victim in crime, the victim in the criminal justice system, (including jury perceptions of victims) victim assistance programs, and victim/offender reconciliation programs. Prerequisite: SOC 105.

291 - SPECIAL TOPICS IN SOCIOLOGY
1.00 to 4.00 Credits

347 - RACE, CLASS, AND GENDER
4.00 Credits
Analysis of the structural interplay and social ramifications of race, social class, and gender. The course focuses on power relationships, intra and intergroup conflict, and minority relations. Prerequisite: SOC 105.

361 - DELINQUENCY AND JUVENILE JUSTICE
4.00 Credits
An analysis of competing theoretical approaches to the causes of delinquent behavior, and the study of the prevention, treatment, and control of delinquency. Procedures and major contemporary issues in Juvenile Justice are addressed. Prerequisite: SOC 105.

362 - OCCUPATIONAL CRIME AND DEVIANCE
4.00 Credits
The various forms of criminal and deviant behavior that occur in the occupational context. A discussion of the nature, extent, consequences, and strategies to control this behavior. Major theoretical perspectives on occupational crime and deviance are considered. Topics covered include: white-collar crime, organized crime, employee theft, career criminality, and workplace violence. Prerequisite: SOC 105.

391 - SPECIAL TOPICS IN SOCIOLOGY
1.00 to 4.00 Credits

446 - CLASSICAL SOCIAL THEORY
4.00 Credits
Traces sociological theorizing from sociology’s historical origins. Major theorists covered include Marx, Durkheim, Weber, Simmel, Chicago School sociologists, Parsons, and classical feminist theorists. Emphasis is on building an understanding of the roots of contemporary social theory. Prerequisite: Senior status. Formerly titled Social Thought.

447 - CONTEMPORARY SOCIAL THEORY
4.00 Credits
The major sociological theories developed since 1960. An examination of the critical debates in contemporary social theory. Prerequisite: Senior status.

481 - SOCIOLOGY INTERNSHIP
8.00 to 16.00 Credits
Supervised placement in an agency which involves work experience related to sociology or criminology or work experience on a research project. Prerequisites: Senior status, 2.75 GPA, consent of instructor, and approval of Department Chairman.

498 - INDEPENDENT STUDY IN SOCIOLOGY
1.00 to 4.00 Credits
Prerequisite: Approval of chairman.
The course work comprising the curriculum in technology is designed to prepare students for careers in professional, technical fields throughout industry and education. The intent is to provide broad, foundational experiences in the technologies and applied sciences that comprise modern industrial-technical society. Carefully structured classroom and laboratory activities feature numerous operations and processes that promote realistic involvement with the construction, manufacturing, technical communications, energy, power, and transportation-related fields. Course work and associated laboratory assignments place emphasis on researching, designing, experimenting, fabricating, and managing.

Both the bachelor of science and the bachelor of arts degree options are available. The number of quarter hours in the major varies depending upon the career path selected. Those selecting the technology education teacher licensure route must complete all state and university requirements for licensure. Those selecting the technology/industrial management path must complete an option/minor comprised of a minimum of 28 hours in one of the following: advanced manufacturing, graphic communication, design analysis, business, or a specially selected option/minor. The business option is outlined in the Arts and Sciences course overview.

The department offers two work experience programs for the industry-bound student. The first is a one-quarter internship designed to give the student a ten-week real-world experience, which is completed during the normal four-year program, usually during the fall of the senior year. The other is a five-year co-op program in which the student completes four to six quarters of work experience, usually with the same company. The program is divided into two, 2 or 3-quarter experiences, one completed after the sophomore year and the other after the junior year. The student gains considerable experience and is able to help offset the cost of school.

The department has established articulation programs with several area community and technical colleges. Refer to a later section and the department chair for more details.

A minor in virtual simulation and another in technology content is available to students in other majors who wish to enter technology-related careers.

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

### Technology Major (industry bound) (all TECH courses)

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<tr>
<th>Code</th>
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<td>Orientation 000</td>
<td>Introduction to Technology 110</td>
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<tr>
<td>MET 101</td>
<td>Metallic Materials and Process I 130</td>
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<td>ART 140</td>
<td>Microcomputer Applications in Technology 140</td>
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<td>CSC 160</td>
<td>Introduction to Computer-Assisted Drafting 220</td>
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<td>ART 141</td>
<td>Computer-Assisted Construction Design 221 or Solid Modeling for Design 421</td>
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<td>MET 101</td>
<td>Computer-Assisted Product Design 223</td>
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<td>BUS 108</td>
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<td>BUS 109</td>
<td>Fundamentals of Electricity/Electronics 361</td>
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<td>BUS 110</td>
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<td>BUS 111</td>
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<td>BUS 115</td>
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<td>BUS 116</td>
<td>Senior Project in Technology 495</td>
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<td>BUS 117</td>
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### Options/Minors (28 hours)

An option or minor is required of all technology-industrial bound students. The business option is outlined in the Arts and Sciences course overview section. The departmental structured options to select from are as follows:

#### Graphic Communication Option

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<td>ART 222</td>
<td>Graphic Design 1</td>
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<td>ART 223</td>
<td>Graphic Design 2</td>
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<tr>
<td>ENGL 243</td>
<td>Magazine Writing</td>
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<tr>
<td>TECH 341</td>
<td>Photography</td>
</tr>
<tr>
<td>TECH 421</td>
<td>Solid Modeling for Design</td>
</tr>
<tr>
<td>TECH 441</td>
<td>Advanced Photography</td>
</tr>
</tbody>
</table>

#### Design Analysis Option

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE 101</td>
<td>Fundamentals of Engineering</td>
</tr>
<tr>
<td>GE 102</td>
<td>Engineering Problem Solving and CAD</td>
</tr>
<tr>
<td>GE 113</td>
<td>Statics</td>
</tr>
<tr>
<td>MATH 163</td>
<td>Calculus 1</td>
</tr>
<tr>
<td>MATH 164</td>
<td>Calculus 2</td>
</tr>
<tr>
<td>GE 214</td>
<td>Dynamics</td>
</tr>
<tr>
<td>GE 223</td>
<td>Strength of Materials</td>
</tr>
<tr>
<td>PHYS 231</td>
<td>Physics: Mechanics of Solids &amp; Fluids</td>
</tr>
</tbody>
</table>
Advanced Manufacturing Option (This option is not open to students who have a virtual simulation minor)

CS 133 Visual Basic or
CS 164 Programming 1
TECH 290 Topics-Multimedia Design & Dev.
TECH 321 Basics of Virtual Simulation
TECH 322 Virtual Simulation of Systems
TECH 421 Solid Modeling for Design
TECH 423 Virtual Sim. Production & Mngmt.
TECH 435 Advanced Robotics (2 times)

Alternative minors/technical options may be selected to match a given student's career goals. This decision is made in consultation with the department of technology.

Internship

All technology-industry bound students (major or minor) are encouraged to complete 15 hours of Internship (TECH 484) in an industrial setting either during a summer or academic year. The arrangements are made through the department prior to the student's registration for the internship.

Co-op

The co-op is a five-year school/work program designed to integrate classroom study with planned and supervised work experiences. Technology co-op students normally are employed in manufacturing, construction or other industry related companies in semi-professional capacities. The employment sessions begin during the summer after the sophomore year. The student contracts for a total of four to six quarters of co-op during which they enroll in TECH 380 (Professional Practice in Technology).

Technology Minor (28 hours)

Students from other disciplines who desire to gain a basic introduction to industry may select a minor as follows (all TECH courses):
Metallic Materials and Processes I 130
Introduction to Computer-Assisted Drafting 220
Introduction to Communication Technology 240
CAD/CAM and Industrial Robotics 332
Construction Technology 350
Electives (minimum of eight credit hours)
Selected from 140, 200, 221, 223, 231, 232, 294, 335, 340, 341, 361, 412, 421, 430, 441, 460, 462, 490, 494, 495, 496, or 497.

Virtual Simulation Minor

The Virtual Simulation Minor is designed to give Ohio Northern University students the opportunity to experience state-of-the-art automation, simulation, and animation procedures that are becoming important supports for multiple disciplines. This minor is available to students with any major who want a concentration of course work in virtual simulation and animation concepts. The minor in Virtual Simulation is not open to students who have an Advanced Manufacturing Option.

CS 133 Visual Basic or
CS 164 Programming 1
TECH 290 Topics-Multimedia Design & Dev.
MATH 142 Introduction to Statistics
TECH 321 Basics of Virtual Simulation
TECH 322 Virtual Simulation of Systems
TECH 423 Virtual Sim. Production & Mngmt.
MATH 122, 160
163, or 164 (Choose one)

Capstone Experience

The purpose of the senior capstone experience is to foster individual research and the application of technical knowledge gained in the technology course work to solve technical problems. This includes following procedures in planning, scheduling, research and development, testing, fabricating, assembling, and evaluating designs.

Alternatives to the traditional senior project requirement for fulfillment of the Senior Capstone experience are as follows:
• 4 quarters of Co-op
• 4 quarters of Robotics Team
• Internship 5 or 15 hrs.
• Student Teaching
• SME certification

Articulation Programs

The department has developed articulation programs with several northwest Ohio community and technical colleges. These programs allow students who have completed associate degrees in technical areas to transfer to the technology program and usually complete the bachelor's degree in two full-time years or four years of part-time attendance. Consult the department chair for details.

Technology Teacher Education (4-12) Vocational Licensure (all TECH courses)
Orientation 000
Introduction to Technology 110
Metallic Materials and Processes I 130
Microcomputer Applications in Technology 140
Introduction to Computer-Assisted Drafting 220
Computer-Assisted Construction Design 221
Computer-Assisted Product Design 223
Metallic Materials and Processes II 230
Product Manufacturing 232
Introduction to Communication Technology 240
Sophomore Seminar in Technology 294
CAD/CAM and Industrial Robotics 332
Manufacturing Automation Systems 335
Construction Technology 350
Fundamentals of Electricity/Electronics 361
Non-metallic Materials and Processes 430
Energy and Transportation 460
Student Teaching Seminar 491
Senior Seminar in Technology 494
Senior Project in Technology 495
Tour of American Industries 496

All students pursuing teacher licensure must complete the professional education sequence; see Center for Teacher Education.

Technical Electives - All Majors
There are several technical courses offered by the department, which may be selected by students to add greater depth. These include (all TECH courses):

Technology and Society 200
Construction Design 221
Custom Woodworking 231
Product Manufacturing 232
Basics of Virtual Simulation 321
Advanced Graphic Communication 340
Photography 341
Solid Modeling for Design 421
Advanced Photography 441
Introduction to Technical Education 474

Subject - Technology (TECH)

000 - ORIENTATION
1.00 Credit
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. Graded S/U.

110 - INTRODUCTION TO TECHNOLOGY
4.00 Credits
For students majoring, minoring, or interested in the Department of Technology. An overview of technology and industry and the two career path options offered by the Department: technology management and technology education. Major technology systems: construction, manufacturing, communication, energy/power/transportation, and management. Lab activities and visitations utilized to reinforce concepts.

130 - METALLIC MATERIALS AND PROCESSES 1
4.00 Credits
Major metallic industrial materials and their processes. The conversion of raw materials via extraction, refining, and processing into consumer products. An emphasis on safety, metallurgy, nondestructive testing, destructive testing and material processing will be applied.

140 - MICROCOMPUTER APPLICATIONS IN TECHNOLOGY
4.00 Credits
Operating microcomputers and various software programs. Utilization of the University’s network will be emphasized during course activities. Windows based machines will be utilized. Some HTML and beginning programming. No prior experience with a computer is required.

190 - SPECIAL TOPICS IN TECHNOLOGY
1.00 to 3.00 Credits
May be repeated as the topic varies.

200 - TECHNOLOGY AND SOCIETY
4.00 Credits
The major concepts of technology; its development, its effects on society, and the problems associated with it. Critical evaluations through written and verbal activities.

220 - INTRODUCTION TO COMPUTER ASSISTED DRAFTING
4.00 Credits
Graphic representation using the personal computer. Attention will be placed on the standards of the technical graphics field and the graphic illustration and visualization techniques as applied to CAD software. Develop proficient use of AutoCAD software for: orthographic projection, sections and conventions, auxiliary views, 3D drawings, and applied geometry.

221 - COMPUTER ASSISTED CONSTRUCTION DESIGN
4.00 Credits
Construction planning, design, engineering and layout. Light construction principles, architectural details, plot surveying and layout, creation of architectural working drawings and cost estimating using Architectural Desktop PC-CAD software. Prerequisite: TECH 220 or permission.

223 - COMPUTER ASSISTED PRODUCT DESIGN
4.00 Credits
Technical sketching, product design processes and the components/variables of good design. Utilization of the computer in the design process to generate working drawings/designs for manufactured products. Oral presentations, analysis of product designs through solids modeling, prototype development and market surveys.
230 - METALLIC MATERIALS AND PROCESSES 2
4.00 Credits
The metallic material processes involved in fabricating and machining of consumer products. Machining technologies include basic traditional machining and non-traditional processes such as EDM, abrasive water and laser technologies. Fabrication operations to be investigated are MIG, TIG, SMAW, resistance, and OXY-acetylene.

231 - CUSTOM WOODWORKING
3.00 Credits
Basic processes, tools, and materials employed in the production of custom, individually designed, and crafted wood products. May be repeated up to a total of nine hours.

232 - PRODUCT MANUFACTURING
4.00 Credits
Machine operations in the manufacture of various types of products, primarily the processing of wood materials into consumer products. Emphasis on process design, material handling, organization of work, division of labor, distribution and sales practices relating to the mass production industries. A major line production will be completed by each class. Formerly TECH 431.

240 - INTRODUCTION TO COMMUNICATION TECHNOLOGY
4.00 Credits
The history of communication technologies, present day procedures, equipment, and materials that are associated with the graphic reproduction techniques of relief, lithography, screen, and copying/duplication as well as graphic layout, design, and composition using desktop publishing technology and finishing and binding. Video communication technology will be covered in addition to graphic reproduction topics.

280 - COOPERATIVE EXPERIENCE ORIENTATION
1.00 Credit
Preparation to begin the co-op experience. Topics discussed include: identifying a position, development of the Co-op Plan, preparing for the first day, position expectations, outline of co-op requirements, getting the most from the experience, and record keeping. Sophomore technology majors with preliminary acceptance in the co-op program. Graded S/U.

290 - SPECIAL TOPICS IN TECHNOLOGY
1.00 to 3.00 Credits
May be repeated as the topic varies.

294 - SOPHOMORE SEMINAR IN TECHNOLOGY
1.00 Credit
Required of all technology majors near the end of their second year of college. Topics: assessment of basic skills, career planning, minor/option selection, review of academic performance, study skills, personality testing, and related topics. Meets one hour per week. Prerequisite: department major and five quarters work. Graded S/U.

321 - BASICS OF VIRTUAL SIMULATION
4.00 Credits
Development of the basic skills needed to perform simulation construction in the virtual environments provided within IGRIP, Virtual NC, and QUEST. Topics will include: user interface, importing and exporting of files, creating parts and devices, jogging devices, configuring files and paths, loading and running simulations, system setup and collision, graphical simulation language concepts, motion kinematics and analysis functions.

322 - VIRTUAL SIMULATION OF SYSTEMS
4.00 Credits
Development of in-depth virtual simulations of discrete events provided by industrial and educational partners. Each student will utilize one or more software packages (IGRIP, Virtual NC, QUEST, ASSEMBLY, and ERGO) to produce simulations that represent a concept provided by a partner. Team work and problem solving is required. Prerequisite: TECH 321.

332 - CAD/CAM AND INDUSTRIAL ROBOTICS
4.00 Credits
Computer automated manufacturing practices (CAD/CAM) converting CAD drawings to NC Machine Code, customization of machine code, and production of metallic and non-metallic products. Industrial robotics will be introduced and hands-on programming of industrial robots will include tasks such as welding, pick and place, finish application, and robot integration into manufacturing facilities. Prerequisites: TECH 130 and 220 or equivalent.
335 - MANUFACTURING AUTOMATION SYSTEMS  
4.00 Credits  
Automated manipulation of industrial materials using educational robots, programmable logic controllers, and computer integrated manufacturing techniques including automatic storage and retrieval, vision, and product identification. Prerequisites: TECH 220 and 332 or equivalent.

340 - ADVANCED GRAPHIC COMMUNICATIONS  
3.00 Credits  
Advanced offset lithography processes including line and produce flast, platemaking, and press operations. Simple advanced graphic communication techniques including prepress design, scanning, digital photography, graphic design, and animation; offset printing, screen printing, signature work, binding and finishing. Individual as well as group projects will be undertaken. May be repeated to a total of six hours. Prerequisite: TECH 240 or permission of the instructor.

341 - PHOTOGRAPHY  
3.00 Credits  
Techniques of photographic composition, camera types, uses and accessories, photographic optics, and laboratory methods and materials; dark room developing and printing of black and white photography.

350 - CONSTRUCTION TECHNOLOGY  
4.00 Credits  
Basic concepts of construction techniques used today; including the methods and materials involved in framing, enclosing, and finishing residential and light commercial buildings. Study of financing, contracting, procuring, supervising, site-operation, foundation, structural elements, utilities, landscaping, and personnel associated with construction activities.

361 - FUNDAMENTALS OF ELECTRICITY AND ELECTRONICS  
4.00 Credits  
The fundamentals of alternating and direct current will be explored in the context of changing technological advances. Basic electrical circuits and electronic parts will be utilized in electronic communication activities. The use and maintenance of test equipment will be emphasized during the testing of analog and basic digital circuits. Formerly TECH 461.

380 - PROFESSIONAL PRACTICE IN TECHNOLOGY  
1.00 Credit  
Study and professional experience in a technology-related occupation in an industrial enterprise, consulting firm, or governmental agency. A midterm and final report on the assignment and employer’s evaluation are required. May be repeated up to a total of 6 hours. Prerequisites: TECH 280, junior status, and minimum 2.5 accumulative GPA. Graded S/U.

390 - SPECIAL TOPICS IN TECHNOLOGY  
1.00 to 3.00 Credits  
May be repeated as the topic varies.

412 - MANUFACTURING MANAGEMENT  
4.00 Credits  
Manufacturing planning, organizing, controlling and directing. Productivity, management foundational concepts, manufacturing enterprise organization, design and equipment design of facilities and processes, equipment selection and maintenance, materials handling inventory control, purchasing and safety. Case studies of industry.

421 - SOLID MODELING FOR DESIGN  
3.00 Credits  
Techniques of illustration and 3D solid modeling with CAD software. Activities include the design and analysis of 3D solid models, rapid prototyping and graphic illustration techniques of designed and finished products or constructed facilities.

423 - VIRTUAL SIMULATION PRODUCTION AND MANAGEMENT  
4.00 Credits  
Development of virtual simulations of discrete events provided by industrial partners. IGRIP, Virtual NC, QUEST, Assembly and Ergo will be utilized to develop advanced models for educational partners as group projects. Focus on the management of requested projects, delivery and presentation of the simulations. Prerequisites: TECH 321 and TECH 322.

430 - NONMETALLIC MATERIALS AND PROCESSES  
4.00 Credits  
Nonmetallic materials and processing. Conversion of raw materials into consumer products via refining and processing. Major emphasis on polymers, ceramics, wood, and composites, with coverage of fibers, fabrics, leathers, and miscellaneous nonmetals.
435 - ADVANCED ROBOTICS/AUTOMATION
2.00 Credits
Advanced investigation of robotics and automated equipment. Topics of investigation will include robot construction, robot programming, PLC’s, CAD/CAM, CIM, FMS, workcell construction. Problem solving based in manufacturing situations is the main emphasis. Prerequisites: TECH 140, 220, 332 and 335. May be repeated up to a maximum of 8 hours.

441 - ADVANCED PHOTOGRAPHY
3.00 Credits
Advanced camera handling techniques, darkroom manipulations of negatives, the large format black and white medium, color positive photography, digital photography. Prerequisite: TECH 341 or equivalent.

460 - ENERGY AND TRANSPORTATION
4.00 Credits
Concepts of energy conversion, power transmission, and applications. Methods of maintaining and repairing energy conversion and transmission devices. A focus is placed on the major components of transportation systems such as propulsion, guidance, suspension, control, support, and structure systems used in stationary and vehicular systems. Formerly TECH 360.

462 - DIGITAL ELECTRONICS: CONCEPTS AND APPLICATIONS
4.00 Credits
Concepts and applications of digital, advanced digital, and basic microprocessor electronic circuits will be explored. An industrial-based application of these concepts will include the areas of robot construction, robotic interfacing, computer interfacing, sensors, controllers, and digital communication. Prerequisite: TECH 361.

470 - QUALITY ASSURANCE
4.00 Credits
Methods applied to quality assurance and work measurement in mass production industries. Consideration will be given to statistical applications, qualitative and quantitative analysis, bio mechanics, work station design, and the planning of systems for total quality assurance programs. Case studies of industry.

484 - INTERNSHIP IN TECHNOLOGY
5.00 to 15.00 Credits
A supervised program of experiences in production practices, management techniques, research applications, and other activities representative in modern industry. Selection is based upon proper application, screening, and acceptance by an appropriate industry. Five hours of credit for 3-4 weeks of full time work in the summer or fifteen hours of credit for one full time quarter during the year. Graded S/U. A maximum of fifteen hours to count toward graduation.

490 - SPECIAL TOPICS IN TECHNOLOGY
1.00 to 3.00 Credits
May be repeated as the topic varies.

491 - STUDENT TEACHING SEMINAR
1.00 Credit
Required to be taken concurrently with student teaching and is in addition to Education Department Seminar EDUC 475. Reinforces field experiences as well as develops insights into implementation of recent curriculum development in Technology Education. Corequisites: EDUC 470 and/or 480. Graded S/U.

492 - INTERNSHIP SEMINAR
1.00 Credit
Provides for a structured method for weekly review and evaluation of the internship experience. Prerequisites: Junior standing and technology major. Graded S/U. Corequisite: TECH 484.

494 – SENIOR SEMINAR IN TECHNOLOGY
1.00 Credit
Required of majors in technology who are within three quarters of graduation. Career planning, placement services, the employment search, graduate school, senior project review, graduation procedures, and related issues. Graded S/U.

495 - SENIOR PROJECT IN TECHNOLOGY
1.00 Credit
Individual study and senior capstone experiences involved with the investigation and application of technological subject matter. Involves research and development, testing, fabricating, assembling, and evaluating designs. May be repeated for a total of 3 credit hours.

496 - TOUR OF AMERICAN INDUSTRIES
1.00 Credit
Participation with the annual department-sponsored comprehensive tour of industries including the structured pre- and post-trip seminars and the submission of a written technical report pertaining to one or more facets of the experience. May be repeated to a total of five hours. Graded S/U.

497 - INDEPENDENT STUDY IN TECHNOLOGY
1.00 to 3.00 Credits
THE COLLEGE OF
Business Administration

Terry L. Maris, Dean

Professors Cooper, Goldberg, Meininger (Associate Dean), Woods; Associate Professors Chipalkatti, Ewing, Rishi, Savino; Assistant Professors Banfe, Christopher, Govekar, Kloft, Zekany; Computer Applications Professional Elsass

Patton Chair
The George Willard Patton Chair of Business and Economics, endowed by the Richard King Mellon Charitable Trust of Pittsburgh, Pennsylvania, has been established beginning with the academic year 1973-74. The 1999-2000 recipient of this endowed professorship is Ken Cooper, professor of finance and management.

Mission Statement

The College of Business Administration will provide students an excellent business education within the context of the liberal arts tradition and the mission of Ohio Northern University. Our intrinsic ability to pursue this mission derives from our primary emphasis upon undergraduate education; the size and reputation of the University; and a curriculum that stresses knowledge and skills within one’s major blended with the extensive liberal arts curriculum of the University.

Quality education will be achieved through emphasis on highly effective teaching and applied research to bring current perspectives on both domestic and international business subjects into the classroom.

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 who have 16 acceptable units of high school credits. Thirteen of these units are prescribed as follows: Four units of English; three units of mathematics (including algebra and geometry); six 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 American College Test or the College Entrance Examination Board Test are expected of all candidates.

Transfer Students

The Ohio Northern University College of Business Administration welcomes students from other accredited colleges and universities. Applications for transfer will be considered only if the student has a prior grade point average of 2.00 on a 4.00 scale, and the student is eligible to return to his/her former institution.

Students transferring from a two-year associate degree program are advised that courses in advanced business subjects (i.e., offered at the college’s 300 or 400 level) taken at a two-year institution are not normally granted credit as equivalents of the business courses taught at Ohio Northern University. Such courses can be accepted as general electives. Under certain circumstances, students could establish equivalent credit through college-administered proficiency tests.

Degree Requirements in General Education

Orientation (ABUS 000)
Communication Skills
1. Writing 1 and 2 (ENGL 110 and 111)
2. One other English course
Fine Arts
1. One Fine Arts course (ART 100, MUSC 100, or COMM 105)
Humanities
1. One Religion course (RELG 105, 107, 108, 109 or 110)
2. One philosophy course
3. Western Civilization 1 and 2 (HIST 110 and 111)
Social Sciences
1. One Social Science Division course
Mathematics and Natural Sciences
1. Finite Mathematics (MATH 144), Calculus with Business Applications (MATH 145), and Statistics (MATH 146)
2. One science course
Health and Physical Education
1. Three physical education service courses (AHPE). A maximum of six such hrs. will count toward graduation.

Additional General Education Requirements For accounting and management majors:
A. Public Speaking (COMM 211), Interpersonal Communication (COMM 225), and one additional communication course selected from the
Professional and Organizational Communication discipline.

B. Eight elective hrs. taken in the College of Arts and Sciences

For international business and economics majors:
A. Public Speaking (COMM 211) or Interpersonal Communication (COMM 225)
B. Demonstrated competency in a foreign language through the second year of college level studies. This requirement may be waived for students whose native language is other than English.
C. An international study and/or internship experience.

An approved Honors Seminar may fulfill a requirement listed above.

Business Administration Core Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>ABUS 000</td>
<td>Orientation</td>
</tr>
<tr>
<td>ABUS 120</td>
<td>Ethics in Bus. Prac.</td>
</tr>
<tr>
<td>ABUS 201</td>
<td>Personal Computer Appl. for Business</td>
</tr>
<tr>
<td>IBEC 202</td>
<td>Prin. of Microeconomics</td>
</tr>
<tr>
<td>IBEC 203</td>
<td>Prin. of Macroeconomics</td>
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<tr>
<td>ACCT 211 &amp; 212</td>
<td>Prin. of Acct. 1 and 2</td>
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<tr>
<td>MGMT 240</td>
<td>Mgmt. Info. Systems</td>
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<tr>
<td>IBEC 300</td>
<td>Environ. of Int'l. Bus.</td>
</tr>
<tr>
<td>ABUS 312</td>
<td>Business Law 1</td>
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<tr>
<td>MGMT 333</td>
<td>Mgmt. &amp; Org. Beh.</td>
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<tr>
<td>MRKT 351</td>
<td>Prin. of Marketing</td>
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<td>FINC 362</td>
<td>Managerial Finance</td>
</tr>
<tr>
<td>MGMT 485</td>
<td>Bus. Policy and Strategy</td>
</tr>
</tbody>
</table>

One elective in economics discipline area

SPECIFIC MAJORS AND MAJOR COURSE REQUIREMENTS

Beyond the general education requirements and the business core, students must also complete specific requirements in their major areas.

The College of Business Administration offers three major areas of study: accounting; international business and economics; and management.

Accounting

The accounting program offers a four-year (182 quarter hour) degree program and is designed for students interested in (1) a career in corporate accounting and who plan to take the Certified Management Accounting or the Certified Internal Auditing examinations as a professional qualification and (2) a career in public accounting and who plan to take the CPA examination.

The curriculum core for the accounting major includes ACCT 301, 302, 314, 315, 435, and eight hours of upper division accounting electives.

Bachelor of Science In Business Administration Accounting Major

<table>
<thead>
<tr>
<th>Year</th>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>First Year</td>
<td>ABUS 000</td>
<td>Orientation 1 hr.</td>
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<tr>
<td></td>
<td>ABUS 120</td>
<td>Ethics in Bus. Prac. 2 hrs.</td>
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<tr>
<td></td>
<td>ABUS 201</td>
<td>Pers. Computer Appl. 4 hrs.</td>
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<tr>
<td></td>
<td>COMM 211</td>
<td>Public Speaking 4 hrs.</td>
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<tr>
<td></td>
<td>ENGL 110, 111</td>
<td>Writing 1 and 2 8 hrs.</td>
</tr>
<tr>
<td></td>
<td>HIST 110, 111</td>
<td>W. Civ. 1 and 2 8 hrs.</td>
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<tr>
<td></td>
<td>MATH 144</td>
<td>Finite Math. 4 hrs.</td>
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<tr>
<td></td>
<td>MATH 145</td>
<td>Calc. with Bus. Appl. 4 hrs.</td>
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<tr>
<td></td>
<td>ART 100 or</td>
<td></td>
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<tr>
<td></td>
<td>COMM 105 or</td>
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<td></td>
<td>MUSC 100</td>
<td>Fine Arts Elective 4 hrs.</td>
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<tr>
<td></td>
<td>RELG</td>
<td>Religion Elective 4 hrs.</td>
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<tr>
<td>Second Year</td>
<td>MATH 146</td>
<td>Statistics 4 hrs.</td>
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<td></td>
<td>ACCT 211, 212</td>
<td>Prin. of Acct. 1, 2 8 hrs.</td>
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<tr>
<td></td>
<td>AHPE</td>
<td>Phys. Ed. Elective 1 hr.</td>
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<tr>
<td></td>
<td>IBEC 202, 203</td>
<td>Micro. &amp; Macro. 8 hrs.</td>
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<tr>
<td></td>
<td>MGMT 240</td>
<td>Mgmt. Info. Syst. 4 hrs.</td>
</tr>
<tr>
<td></td>
<td>ENGL</td>
<td>English Elective 4 hrs.</td>
</tr>
<tr>
<td></td>
<td>PHIL</td>
<td>Philosophy Elective 4 hrs.</td>
</tr>
<tr>
<td></td>
<td>BIOL or CHEM</td>
<td>Science Elective 4 hrs.</td>
</tr>
<tr>
<td></td>
<td>COMM 225</td>
<td>Interpersonal Comm. 4 hrs.</td>
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<td>COMM</td>
<td>Comm. Elective 4 hrs.</td>
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<td>Total</td>
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<tr>
<td>Third Year</td>
<td>ACCT 301, 302</td>
<td>Intermediate Acct. 1, 2 8 hrs.</td>
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<td></td>
<td>ABUS 312</td>
<td>Business Law 1 4 hrs.</td>
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<tr>
<td></td>
<td>ACCT 314, 315</td>
<td>Int. Manag. Acct. 1, 2 8 hrs.</td>
</tr>
<tr>
<td></td>
<td>IBEC 300</td>
<td>Environ. of Int'l. Bus. 4 hrs.</td>
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<tr>
<td></td>
<td>MGMT 333</td>
<td>Mgmt. &amp; Org. Beh. 4 hrs.</td>
</tr>
<tr>
<td></td>
<td>MRKT 351</td>
<td>Prin. of Marketing 4 hrs.</td>
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<tr>
<td></td>
<td>FINC 362</td>
<td>Managerial Finance 4 hrs.</td>
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<td></td>
<td>MGMT 364</td>
<td>Prod. &amp; Ops. Mgmt. 4 hrs.</td>
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<td>Arts &amp; Sciences Elect. 8 hrs.</td>
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<td>Total</td>
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<td>Fourth Year</td>
<td>ACCT 435</td>
<td>International Acct. 4 hrs.</td>
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<td></td>
<td>ACCT</td>
<td>Accounting Electives 8 hrs.</td>
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<tr>
<td></td>
<td>IBEC</td>
<td>Economics Elective 4 hrs.</td>
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<td></td>
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<td>General Electives 20 hrs.</td>
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<td>40 hrs.</td>
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</table>
CPA Program

Students planning to sit for the Certified Public Accounting examination will have to have earned 150 semester (225 quarter) hours of academic credit. A 225 quarter-hour program has been developed to serve these students. The additional recommended courses for the CPA program include ACCT 303, 387, 388, 389, 392, 402, 403, 404, and ABUS 313. Twelve additional hours of elective course work in the College of Arts and Sciences are required.

International Business and Economics

The curriculum core for the international business and economics major includes: IBEC 352, 385, 453, 467, and 486.

Bachelor of Science in Business Administration

International Business and Economics Major Curriculum

<table>
<thead>
<tr>
<th>First Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ABUS 000</td>
<td>Orientation  1 hr.</td>
</tr>
<tr>
<td>ABUS 120</td>
<td>Ethics in Bus. Prac.  2 hrs.</td>
</tr>
<tr>
<td>ABUS 201</td>
<td>Pers. Computer Appl.  4 hrs.</td>
</tr>
<tr>
<td>ENGL 110, 111</td>
<td>Writing 1 and 2  8 hrs.</td>
</tr>
<tr>
<td>HIST 110, 111</td>
<td>Western Civ. 1 and 2  8 hrs.</td>
</tr>
<tr>
<td>MATH 144</td>
<td>Finite Math.  4 hrs.</td>
</tr>
<tr>
<td>MATH 145</td>
<td>Calc. with Bus. Appl.  4 hrs.</td>
</tr>
<tr>
<td>ART 100 or</td>
<td></td>
</tr>
<tr>
<td>COMM 105 or</td>
<td></td>
</tr>
<tr>
<td>MUSC 100 or</td>
<td>Fine Arts Elective  4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Foreign Language  12 hrs.</td>
</tr>
<tr>
<td>TOTAL</td>
<td>49 hrs.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AHPE</td>
<td>Phys. Ed. Elective  1 hr.</td>
</tr>
<tr>
<td>ACCT 211, 212</td>
<td>Prin. of Accounting 1, 2  8 hrs.</td>
</tr>
<tr>
<td>or 225</td>
<td>Speech Comm.  4 hrs.</td>
</tr>
<tr>
<td>IBEC 202, 203</td>
<td>Microeconomics and Macroeconomics  8 hrs.</td>
</tr>
<tr>
<td>MATH 146</td>
<td>Statistics  4 hrs.</td>
</tr>
<tr>
<td>MGMT 240</td>
<td>Mgmt. Information Syst.  4 hrs.</td>
</tr>
<tr>
<td>ENGL</td>
<td>English Elective  4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Foreign Language  12 hrs.</td>
</tr>
<tr>
<td>TOTAL</td>
<td>45 hrs.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ABUS 300</td>
<td>Environ. of Int'l. Bus.  4 hrs.</td>
</tr>
<tr>
<td>ABUS 312</td>
<td>Business Law  4 hrs.</td>
</tr>
<tr>
<td>MGMT 333</td>
<td>Mgmt. &amp; Org. Beh.  4 hrs.</td>
</tr>
<tr>
<td>MRKT 351</td>
<td>Prin. of Marketing  4 hrs.</td>
</tr>
<tr>
<td>IBEC 352</td>
<td>Money &amp; Banking  4 hrs.</td>
</tr>
<tr>
<td>FINC 362</td>
<td>Managerial Finance  4 hrs.</td>
</tr>
<tr>
<td>IBEC 385</td>
<td>Int'l. Economics  4 hrs.</td>
</tr>
<tr>
<td>IBEC 467</td>
<td>Int'l. Finance  4 hrs.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fourth Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MGMT 364</td>
<td>Prod. &amp; Ops. Mgmt.  4 hrs.</td>
</tr>
<tr>
<td>IBEC 453</td>
<td>Int'l. Mkrt.  4 hrs.</td>
</tr>
<tr>
<td>MGMT 485</td>
<td>Bus. Policy &amp; Strat.  4 hrs.</td>
</tr>
<tr>
<td>IBEC 486</td>
<td>Int'l. Mgmt.  4 hrs.</td>
</tr>
<tr>
<td>IBEC</td>
<td>Economics Elective  4 hrs.</td>
</tr>
<tr>
<td></td>
<td>General Electives  20 hrs.</td>
</tr>
<tr>
<td>TOTAL</td>
<td>40 hrs.</td>
</tr>
</tbody>
</table>

Management

The curriculum core for the management major includes: MGMT 334, 363, 486, and 12 hrs. of upper division management electives.

Bachelor of Science in Business Administration

Management Major Curriculum

<table>
<thead>
<tr>
<th>First Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ABUS 000</td>
<td>Orientation  1 hr.</td>
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<tr>
<td>ABUS 120</td>
<td>Ethics in Bus. Prac.  2 hrs.</td>
</tr>
<tr>
<td>ABUS 201</td>
<td>Pers. Computer Appl.  4 hrs.</td>
</tr>
<tr>
<td>COM 211</td>
<td>Public Speaking  4 hrs.</td>
</tr>
<tr>
<td>IBEC 202, 203</td>
<td>Microeconomics and Macroeconomics  8 hrs.</td>
</tr>
<tr>
<td>MATH 146</td>
<td>Statistics  4 hrs.</td>
</tr>
<tr>
<td>MGMT 240</td>
<td>Mgmt. Information Syst.  4 hrs.</td>
</tr>
<tr>
<td>ENGL</td>
<td>English Elective  4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Foreign Language  12 hrs.</td>
</tr>
<tr>
<td>TOTAL</td>
<td>49 hrs.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AHPE</td>
<td>Phys. Ed. Elective  1 hr.</td>
</tr>
<tr>
<td>ACCT 211, 212</td>
<td>Prin. of Accounting 1, 2  8 hrs.</td>
</tr>
<tr>
<td>IBEC 202, 203</td>
<td>Microeconomics and Macroeconomics  8 hrs.</td>
</tr>
<tr>
<td>MATH 146</td>
<td>Statistics  4 hrs.</td>
</tr>
<tr>
<td>MGMT 240</td>
<td>Mgmt. Information Syst.  4 hrs.</td>
</tr>
<tr>
<td>ENGL</td>
<td>English Elective  4 hrs.</td>
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<tr>
<td></td>
<td>Foreign Language  12 hrs.</td>
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<td>TOTAL</td>
<td>45 hrs.</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Third Year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>IBEC 352</td>
<td>Environ. of Int'l. Bus.  4 hrs.</td>
</tr>
<tr>
<td>IBEC 385</td>
<td>Business Law  4 hrs.</td>
</tr>
<tr>
<td>MGMT 334</td>
<td>Cases &amp; Exer. in Org. Beh.  4 hrs.</td>
</tr>
<tr>
<td>MRKT 351</td>
<td>Prin. of Marketing  4 hrs.</td>
</tr>
<tr>
<td>FINC 362</td>
<td>Managerial Finance  4 hrs.</td>
</tr>
<tr>
<td>MGMT 363</td>
<td>Human Resource Mgmt.  4 hrs.</td>
</tr>
<tr>
<td>MGMT 364</td>
<td>Prod. &amp; Ops. Mgmt.  4 hrs.</td>
</tr>
<tr>
<td></td>
<td>Arts &amp; Sciences Elect.  8 hrs.</td>
</tr>
</tbody>
</table>
Dual Majors
No course used to satisfy either a specific requirement or a discipline elective may be counted toward a dual major except as a general elective.

Minor in Business Administration
The minor is available only to non-business majors. (A "C" grade or higher is required in all courses.) A minimum of 20 hours required for the minor must be completed at Ohio Northern University.

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 general education specific and elective courses in the College of Arts and Sciences.
2. The Business Administration core requirements and electives.
3. The specific major requirements and electives.
4. Satisfactory completion and presentation of a minimum of 182 quarter hours of appropriate course work for the specific major(s).
5. A minimum of 28 hours of required business courses at the 300 or 400 level to be completed at Ohio Northern University with at least 16 of these hours taken in the student’s major.
6. A minimum 2.00 grade point average.
7. A letter grade of "C" or better in all but one course specified in (2) and (3) above.

S/U Grade Option
Sophomores, juniors, seniors, and postgraduate students in the College of Business Administration 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 registered full-time in the College of Business Administration.
2. The student must have sophomore, junior, senior, or postgraduate 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. CBA cognates include all required mathematics and speech communication courses.
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.

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Service and Activities Courses

A combined maximum of 24 hrs. of credit in varsity sports, physical education service courses, applied music, and music performance courses may be counted for graduation. Service and activity courses cannot be used to satisfy College of Arts and Sciences elective requirements. Only three credits in the same varsity sport may be counted toward graduation. Only six credits in the same music performance activity may be counted toward graduation.

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Classification of Students

For purposes of classification, the minimum requirements for sophomore standing are 45 quarter hrs. of completed academic work; for junior standing 90 quarter hrs.; and for senior standing 135 quarter hrs.

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Academic Standing

A grade point average of 2.00 or higher is required for graduation. If a student’s accumulative grade point average falls below 2.00, he/she is placed on academic probation and is not eligible to participate in competitive activities of individuals, teams, or other groups officially designated as representing the University.

Any student on probation whose work for the following quarter continues below 2.00 accumulative grade point average 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 or dismissal from the college.

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Prelaw Program

Business students interested in the Prelaw Program will find a complete description on page 33 of this publication.

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Small Business Institute

The Small Business Institute (SBI) provides intensive business counseling by utilizing small teams of qualified university students in business disciplines under expert faculty guidance. The students meet frequently over the course of a full university term with the small business owner to identify and solve unique business problems.

The SBI program was established by the Small Business Administration in 1972. Approximately 500 business colleges have been carefully chosen throughout the United States to administer this program.

A detailed case report is written and given to the client with suggestions as to how to implement it. SBI teams work on most business-related problems and provide recommendations tailored to the specific needs of the business.

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Internship Program

The internship program in the College of Business Administration has been designed to help students gain these valuable experiences while still in college. By combining the concepts discussed in the classroom with practical on-the-job experiences, the internship program helps prepare the businessmen and businesswomen of tomorrow.

Academic year internships may be full- or part-time programs lasting 10 weeks. Students usually work in the Ohio Northern University area. Interns may earn as many as 16 quarter hours of credit.

Summer internships take place in several locations throughout Ohio and beyond. As with academic-year internships, students may earn up to 16 credit hours.

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Dual Degree Programs

Information concerning dual degree programs involving the College of Business Administration appears on page 33 of this catalog. Students may receive further details in the office of the dean of the college.

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International Business Program

The international business program is coordinated by the College's International Experience Committee. Students may participate in study abroad, work abroad, or student exchange.
Study abroad may take place at virtually any foreign college or university if the academic program is determined to meet certain standards for transfer of credit. Students are encouraged to enroll for a full academic year abroad. In some cases, study may occur during the summer or for a lesser period during the academic year.

Work abroad is available to ONU business students in cooperation with the Council on International Educational Exchange. This option may be combined with study abroad or pursued independently during the summer. A special bonus is that such employment may qualify the student to earn up to 16 credits toward graduation through the internship program.

Formal agreements for the exchange of students between Ohio Northern University and several prominent foreign institutions offer many opportunities for business students. These include Glasgow Caledonian University (Scotland), the University of Science and Technology of Lille (France), the Plekhanov Economic Academy (Russia), Arnhem Business School (Netherlands), Helsinki School of Economics and Business Administration (Finland), Instituto Tecnologico de Monterrey, Campus Queretaro (Mexico), the University of Ulster (United Kingdom), Southern Cross University (Australia), and Universidad Latina de Costa Rica (Costa Rica). Additional study-abroad experiences have taken place at the University of the Andes (Venezuela), Universidad Catolica de Valparaiso (Chile), Bond University (Sydney, Australia), and Universidad Iberoamericana (Mexico).

The College also sponsors summer international business tours designed to satisfy the international experience requirement of International Business and Economics majors. The programs are open to all students and provide an opportunity to visit a variety of international corporations and agencies.


Students with a foreign language background are likely to find that they have more opportunity to take advantage of these programs. All business students therefore are strongly advised to continue their foreign language study at ONU. Those who have no prior course work in foreign language are encouraged to incorporate such courses into their undergraduate studies.

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**COLLEGE OF BUSINESS ADMINISTRATION**

**Subject - General Business (ABUS)**

**000 - ORIENTATION / CAREER DEVELOPMENT AND SEARCH**

1.00 Credit

Familiarization with the college, requirements of the majors, planning sequences of courses, university catalog and library, career investigation and guidance. Fall Quarter. Graded S/U.

**120 - ETHICS IN BUSINESS PRACTICE**

2.00 Credits

Systematic examination of alternative ethical decision making approaches followed by case analysis and discussion. Provides individual reflection and experience in alternative ethical approaches. Not open to students entering the College of Business prior to Fall Quarter 1998.

**190 - SPECIAL TOPICS IN BUSINESS**

1.00 to 4.00 Credits

Can be repeated as the topic varies.

**201 - PERSONAL COMPUTER APPLICATIONS FOR BUSINESS**

4.00 Credits

Business applications for microcomputers. Introductory level use of software for word processing, file management, spreadsheets, and graphics.

**312 - BUSINESS LAW 1**

4.00 Credits

The legal environment in which businesses must operate. Topics include business ethics, sources of law, methods of dispute resolution, and the basic law regulating contracts, agency, business organizations, the workplace, consumer transactions, purchase and sale of securities, anticompetitive activities, actions affecting the environment, and international business transactions. Prerequisite: Junior standing.

**313 - BUSINESS LAW 2**

4.00 Credits

The law as it applies to certain private business transactions. Topics include contracts, sales, commercial paper, secured transactions, suretyship, bankruptcy, insurance, property, landlord/tenant, wills, estates, and trusts. Prerequisite: ABUS 312.

**395 - MULTIMEDIA DESIGN AND DEVELOPMENT**

4.00 Credits

Techniques of effective oral, written, and visual communications in a multimedia business environment. Topics include but are not limited to information design, interaction design, and presentation design through print, audio, and video media. Prerequisite: ABUS 201.
### Subject - Accounting (ACCT)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>211</td>
<td>PRINCIPLES OF ACCOUNTING 1</td>
<td>4.00</td>
<td>Analysis and recording of business transactions and accumulating data on the results of economic activity, concepts and issues of financial reporting for business entities, including basic theory of the report writing model. Basic financial statement analysis.</td>
</tr>
<tr>
<td>212</td>
<td>PRINCIPLES OF ACCOUNTING 2</td>
<td>4.00</td>
<td>Continuation of ACCT 211. Uses of accounting data to support management decision-making and control of business operations, determination of costs and cost behavior. Specialized application areas of accounting. Prerequisite: ACCT 211.</td>
</tr>
<tr>
<td>292</td>
<td>SPECIAL TOPICS IN ACCOUNTING</td>
<td>1.00 to 4.00</td>
<td>Can be repeated as the topic varies.</td>
</tr>
<tr>
<td>301</td>
<td>INTERMEDIATE ACCOUNTING 1</td>
<td>4.00</td>
<td>Financial accounting functions and basic theory. Preparation of financial statements and actuarial methods. Current assets. Prerequisite: ACCT 212.</td>
</tr>
<tr>
<td>302</td>
<td>INTERMEDIATE ACCOUNTING 2</td>
<td>4.00</td>
<td>Preparation of financial statements, operational assets, long term liabilities, leases, and owners' equity. Prerequisite: ACCT 301.</td>
</tr>
<tr>
<td>303</td>
<td>INTERMEDIATE ACCOUNTING 3</td>
<td>4.00</td>
<td>Preparation of financial statements. Pensions and post-retirement benefits, accounting changes, deferred income taxes, financial statement analysis, changing prices, special topics and EPS. Prerequisite: ACCT 302.</td>
</tr>
<tr>
<td>316</td>
<td>ADVANCED MANAGERIAL ACCOUNTING</td>
<td>4.00</td>
<td>Advanced Corporate Budgeting procedures. An in-depth analysis of product costing techniques including activity based costing, analysis of cost drivers, total quality management. Topics in strategic cost management and current issues and techniques in management accounting. Offered alternate years. Prerequisite: ACCT 315.</td>
</tr>
<tr>
<td>387</td>
<td>TAXATION OF INDIVIDUALS</td>
<td>4.00</td>
<td>Federal income tax planning and reporting for individuals. Topics include gross income, personal and business deductions, and tax credits. Prerequisite: ACCT 212.</td>
</tr>
<tr>
<td>388</td>
<td>TAXATION OF PROPERTY TRANSACTIONS AND C CORPORATIONS</td>
<td>4.00</td>
<td>Federal income tax planning and reporting for complex individual income tax issues, property transactions, and C corporations. Topics include alternative minimum tax, accounting periods, nontaxable exchanges, capital gains and losses, recapture, and corporate organizations, distributions and accumulations. Prerequisite: ACCT 387.</td>
</tr>
<tr>
<td>389</td>
<td>TAXATION OF S CORPORATIONS, PARTNERSHIPS, TRUSTS, ESTATES AND GIFTS</td>
<td>4.00</td>
<td>Federal income tax planning and reporting for S corporations, partnerships, estates, trusts, and tax exempt entities. Federal gift and estate tax planning and reporting. Prerequisite: ACCT 388.</td>
</tr>
<tr>
<td>392</td>
<td>ADVANCED FINANCIAL ACCOUNTING</td>
<td>4.00</td>
<td>Various forms of business combinations and intercompany transactions, transactions denomi-</td>
</tr>
</tbody>
</table>
nated in foreign currencies, and government accounting. Offered alternate years. Prerequisite: ACCT 303.

402 - ACCOUNTING INFORMATION SYSTEMS
4.00 Credits
The use, evaluation, and design of accounting information systems with emphasis upon the interface of accounting systems and computer technology. Prerequisite: ACCT 302.

403 - AUDITING 1
4.00 Credits
Auditing procedures and practices relating to the independent verification of financial records, including assessment of the internal control system, audit evidence, issues of materiality and risk, and audit reports. Prerequisite: ACCT 402.

404 - AUDITING 2
4.00 Credits
Statistical sampling in auditing, auditor’s professional ethics and legal liability, computer technology in auditing, and current issues and problems in auditing. Prerequisite: ACCT 403.

427 - INTERNSHIP IN ACCOUNTING
4.00 to 16.00 Credits
Field experience in accounting. Graded S/U. Can be repeated for a maximum of sixteen credit hours. Can be used only as general elective hours. Can not be used to satisfy either accounting or business elective requirements. Consult advisor.

435 - INTERNATIONAL FINANCIAL ACCOUNTING
4.00 Credits
Financial accounting from a multinational viewpoint. Includes: financial accounting for international operations, comparative international accounting principles, and international financial reporting. Prerequisite: ACCT 302. (Also listed as IBEC 435.)

492 - SPECIAL TOPICS IN ACCOUNTING
1.00 to 4.00 Credits
Can be repeated as the topic varies.

499 - INDEPENDENT STUDY IN ACCOUNTING
1.00 to 4.00 Credits
An in-depth exploration of a subject of special interest to both the student and the faculty member. Can be repeated as topic varies. 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.

Subject - Finance (FINC)

362 - MANAGERIAL FINANCE
4.00 Credits
The role of financial management in the firm, and the basic tools and concepts of the firm’s investment, financing and dividend decisions including working capital management, capital budgeting and capital structure strategies. Prerequisites: MATH 144 and ACCT 212.

369 - INTERMEDIATE FINANCIAL MANAGEMENT
4.00 Credits
Advanced concepts and methods employed in financial management. Topics include financial analysis and planning, working capital management, risk analysis and valuation of long-term investments, and capital structure analysis. Case method and personal computer based spreadsheets will be used. Offered alternate years. Prerequisite: FINC 362.

421 - INTERNSHIP IN FINANCE
4.00 to 16.00 Credits
Field experience in finance. Graded S/U. Internship experiences can be repeated for a maximum of sixteen credit hours. Can be used only as general elective hours and can not be used to satisfy either finance or business elective requirements. Consult advisor.

461 - INVESTMENTS
4.00 Credits
The risk-return trade off and distinctive characteristics of different vehicles of financial investment including equities; debt and derivatives; portfolio management; the functioning and regulation of securities markets; the operation of mutual funds and other investment companies. The Efficient Markets Hypothesis receives special attention. Foundations for corporate as well as personal investment decisions. Computer simulations and applications. Prerequisite: FINC 362.

467 - INTERNATIONAL FINANCE
4.00 Credits
The unique financial challenges and opportunities faced by a multinational enterprise. Hedging as a pivotal tool of exchange rate risk management; the long-term and short-term financing opportunities available to a multinational enterprise; international cash management; and multinational capital budgeting. Prerequisites: FINC 362 and IBEC 300. (Also listed as IBEC 467.)

494 - SPECIAL TOPICS IN FINANCE
1.00 to 4.00 Credits
Can be repeated as the topic varies.
INDEPENDENT STUDY IN FINANCE
1.00 to 4.00 Credits
An in-depth exploration of a subject of special interest to both the student and the faculty member. Can be repeated as topic varies. Permission to enroll must be obtained in writing from the faculty-mentor and the Dean of the College prior to registration. Restricted enrollment. Prerequisites: Junior standing and approval of faculty member.

Subject - International Business and Economics (IBEC)

100 - ECONOMICS
4.00 Credits
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. A terminal course for non-business majors. May not be taken following a successful enrollment in IBEC 202 or IBEC 203. (Formerly ECON 100.) (Discipline: Economics)

202 - PRINCIPLES OF MICROECONOMICS
4.00 Credits
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. No prerequisite. (Formerly ECON 202.) (Discipline: Economics)

203 - PRINCIPLES OF MACROECONOMICS
4.00 Credits
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: IBEC 202. (Formerly ECON 203) (Discipline: Economics)

290 - SPECIAL TOPICS IN INTERNATIONAL BUSINESS AND ECONOMICS
1.00 to 4.00 Credits
Can be repeated as the topic varies.

292 - CROSS-CULTURAL MANAGEMENT
4.00 Credits
An examination of the application of societal and corporate culture and its consequences in managerial and organizational settings in Western Europe. Convergency with and divergency from American corporate culture will be explored. Prerequisite: Participation in a college sponsored summer business tour. (Also listed as MGMT 292.)

300 - THE ENVIRONMENT OF INTERNATIONAL BUSINESS
4.00 Credits
The unique functional and environmental features of international business. Analysis of economic, cultural, legal and political forces affecting international business operations. Examination of organizational responses to the challenges of international business organizations. Prerequisite: IBEC 203. (Formerly ABUS 300)

341 - LABOR ECONOMICS
4.00 Credits
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. Offered alternate years. Prerequisite: IBEC 203. (Formerly ECON 341) (Discipline: Economics)

352 - MONEY AND BANKING
4.00 Credits
Theories of money and credit; commercial banking practices; reserve banking; monetary and banking laws; money market; money and credit in the world economy. Prerequisite: IBEC 203. (Formerly ECON 352) (Discipline: Economics)

383 - INTERMEDIATE MICROECONOMIC THEORY
4.00 Credits
Special problems of pricing, production, and distribution under perfect competition, monopoly, oligopoly, and duopoly in the American economy. Offered alternate years. Prerequisite: IBEC 203. (Formerly ECON 383) (Discipline: Economics)

384 - INTERMEDIATE MACROECONOMIC THEORY
4.00 Credits
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. Offered alternate years. Prerequisite: IBEC 203. (Formerly ECON 384) (Discipline: Economics)

385 - INTERNATIONAL ECONOMICS
4.00 Credits
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. Prerequisite: IBEC 203. (Formerly ECON 385) (Discipline: Economics)

411 - COMPARATIVE ECONOMIC SYSTEMS
4.00 Credits
Comparative study of capitalism, socialism, communism and mixed economies. Emphasis on the economics of pricing, production, and distribution under different systems. Comparative analysis of selected countries. Offered alternate years. Prerequisite: IBEC 203. (Formerly ECON 411) (Discipline: Economics)
423 - ECONOMICS OF THE PUBLIC SECTOR  
4.00 Credits  
Fiscal institutions and decisions of the Public Sector; the federal budget; public good analysis, public debt issues; evaluation of tax sources for the federal, state, and local government levels; and intergovernmental fiscal relationships. Offered alternate years. Prerequisite: IBEC 203. (Formerly ECON 423) (Discipline: Economics)

426 - INTERNSHIP IN INTERNATIONAL BUSINESS AND ECONOMICS  
4.00 to 16.00 Credits  
Field experience in international business and/or economics. Graded S/U. Internship experiences can be repeated for a maximum of sixteen credit hours. Can be used as general elective hours and cannot be used to satisfy either international business and economics or business elective requirements.

435 - INTERNATIONAL FINANCIAL ACCOUNTING  
4.00 Credits  
Financial accounting from a multinational viewpoint. Includes: financial accounting for international operations, comparative international accounting principles, and financial reporting. Prerequisite: ACCT 302. (Also listed as ACCT 435.)

442 - ECONOMIC HISTORY OF THE UNITED STATES  
4.00 Credits  
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. Offered alternate years. Prerequisite: IBEC 203. (Formerly ECON 442) (Discipline: Economics)

443 - HISTORY OF ECONOMIC THOUGHT  
4.00 Credits  
The development of economic thought from Greek and Hebrew writers to modern economists; Adam Smith, Malthus, Ricardo, Marx, Marshall, Keynes, and modern economists. Offered alternate years. Prerequisite: IBEC 203. (Formerly ECON 443) (Discipline: Economics)

453 - INTERNATIONAL MARKETING  
4.00 Credits  
World markets, their respective consumers and environments, and the marketing management required to meet the demand of world markets in a dynamic and ever changing setting. Contrasting marketing in the United States with marketing in foreign countries. Case studies illustrate marketing problems faced by international marketers. Prerequisites: IBEC 300 and MRKT 351. (Also listed as MRKT 453.)

467 - INTERNATIONAL FINANCE  
4.00 Credits  
The unique financial challenges and opportunities faced by a multinational enterprise. Hedging as a pivotal tool of exchange rate risk management; the long-term and short-term financing opportunities available to a multinational enterprise; international cash management; and multinational capital budgeting. Prerequisites: FINC 362 and IBEC 300. (Also listed as FINC 467.)

486 - INTERNATIONAL MANAGEMENT  
4.00 Credits  
The application of management concepts and techniques in a multinational environment. The meaning of culture as it applies to international management. Issues in international human resource management. A focus on relevant business simulations and cases. Prerequisites: FINC 362, IBEC 300, MGMT 333 and MRKT 351. (Also listed as MGMT 486.)

490 - SPECIAL TOPICS IN INTERNATIONAL BUSINESS AND ECONOMICS  
1.00 to 4.00 Credits  
Can be repeated as the topic varies.

497 - INDEPENDENT STUDY IN INTERNATIONAL BUSINESS AND ECONOMICS  
1.00 to 4.00 Credits  
An in-depth exploration of a subject of special interest to both the student and faculty member. Can be repeated as topic varies. Permission must be obtained in writing from the faculty mentor and the Dean of the College prior to registration. Restricted enrollment. Prerequisites: Junior standing and approval of the instructor.

Subject - Management (MGMT) ———

240 - MANAGEMENT INFORMATION SYSTEMS  
4.00 Credits  
The development, design and implementation of management information systems with introduction to the terminology, concepts and trends in computer hardware and software. Prerequisite: ABUS 201.

291 - SPECIAL TOPICS IN MANAGEMENT  
1.00 to 4.00 Credits  
Can be repeated as the topic varies.

292 - CROSS-CULTURAL MANAGEMENT  
4.00 Credits  
An examination of the application of societal and corporate culture and its consequences in managerial and organizational settings in Western Europe. Convergency with and divergency from American corporate culture will be explored. Prerequisite: Participation in a college sponsored summer business tour. (Also listed as IBEC 292.)

325 - EMPLOYMENT LAW  
4.00 Credits  
The legal relationship between employers and employees. Topics include the basic laws regulating labor relations, employment discrimination, workers’ compensation and disability
payments, occupational safety and health, employment, and unemployment compensation, termination of employment, and retirement. Prerequisite: ABUS 312.

**333 - MANAGEMENT AND ORGANIZATIONAL BEHAVIOR**  
4.00 Credits  
Modern management concepts with emphasis on the human factors in organizations. Historical foundations of managerial problems, investigation of individual, group and organizational processes including current management issues. (Formerly offered as MGMT 330 and MGMT 335) Prerequisite: Junior standing.

**334 - CASES AND EXERCISES IN ORGANIZATIONAL BEHAVIOR**  
4.00 Credits  
Experiential and case-based approach to managing organizational behavior. Prerequisite: MGMT 333.

**363 - HUMAN RESOURCE MANAGEMENT**  
4.00 Credits  
Analysis of the role of human resources in contemporary organizations. Functions performed by the human resource practitioner in the areas of recruitment, training and development, compensation, employee relations, health and safety, and employee separation. The impact of government regulations. Prerequisite: MGMT 333.

**364 - PRODUCTION AND OPERATIONS MANAGEMENT**  
4.00 Credits  
Major issues and analytical problem solving techniques existing in the field of production and operations management. The design of production systems, operation, coordination and control of production activity in the context of minimum cost attainment. Prerequisites: MATH 146, MGMT 333 and junior standing.

**380 - PRINCIPLES OF ELECTRONIC COMMERCE**  
4.00 Credits  
Connection of business systems via the Internet directly to critical constituencies: customers, employees, vendors, and suppliers. Electronic commerce and its dimensions, benefits, limitations, and process. Electronic commerce infrastructure and major applications of electronic commerce. Prerequisites: ABUS 201, MGMT 333 and MRKT 351.

**400 - CURRENT LABOR RELATIONS**  
4.00 Credits  
Managerial and organizational aspects arising out of employer/union relations. The evolution of labor relations, current labor law, negotiation and administration of labor agreements, and labor relations in the public sector as well as in foreign countries. Open to seniors only. Offered alternate years. Prerequisite: MGMT 363.

**410 - BUSINESS AND SOCIETY**  
4.00 Credits  
The complex and dynamic interrelationships between business and society: the social, cultural, legal, ethical, economic and technological issues, philosophies and points of view which influence business. Issues of corporate responsibility, individual rights and multi-national business. Prerequisite: MGMT 333.

**425 - INTERNSHIP IN MANAGEMENT**  
4.00 to 16.00 Credits  
Field experience in management. Graded S/U. Internship experiences can be repeated for a maximum of sixteen credit hours. Can be used only as general elective hours and can not be used to satisfy either management or business elective requirements. Consult advisor.

**474 - SMALL BUSINESS MANAGEMENT**  
4.00 Credits  
The importance of small business, its current status, problems encountered and requirements for successful operations. Emphasis on problem solving techniques for small businesses. Prerequisites: ABUS 312, MGMT 333, MRKT 351, FINC 362 and MATH 146.

**485 - BUSINESS POLICY AND STRATEGY**  
4.00 Credits  
Integrative capstone course designed to provide students with an awareness of the roles and responsibilities of managers as they formulate and implement direction for their organizations in an ever changing environment. Case study is emphasized. Prerequisites: Senior standing and ABUS 312, MGMT 333, MRKT 351 and FINC 362.

**486 - INTERNATIONAL MANAGEMENT**  
4.00 Credits  
The application of management concepts and techniques in a multinational environment. The meaning of culture as it applies to international management. Issues in international human resource management. A focus on relevant simulations and cases. Prerequisites: FINC 362, IBEC 300, MGMT 333, and MRKT 351. (Also listed as IBEC 486.)

**491 - SPECIAL TOPICS IN MANAGEMENT**  
1.00 to 4.00 Credits  
Can be repeated as the topic varies.

**498 - INDEPENDENT STUDY IN MANAGEMENT**  
1.00 to 4.00 Credits  
An in-depth exploration of a subject of special interest to both the student and the faculty member. Can be repeated as topic varies. Restricted enrollment. Permission to enroll must be obtained in writing from the faculty-mentor and the Dean of the College prior to registration. Prerequisite: Junior standing and approval of the instructor.
Subject - Marketing (MRKT)

351 - PRINCIPLES OF MARKETING
4.00 Credits
Product design and planning, promotional activities, pricing strategy, aspects of physical distribution, retailing, market research and buyer behavior. Strategic marketing, planning and control, ethics and international marketing. Prerequisite: Junior standing.

370 - RETAILING
4.00 Credits
Retail store formats, trading area analysis, store location and design, inventory evaluation and management, pricing strategies, sales promotion, merchandising planning, procurement and selling functions. Prerequisite: MRKT 351.

371 - PERSONAL SELLING
4.00 Credits
Aspects of the behavioral approach to selling in the context of the marketing concept. Selling techniques which build long term customer relationships. Prospecting, ethics, qualifying, presenting, product demonstrations, handling objections, closing and follow up techniques, and international selling. Prerequisite: MRKT 351.

372 - ADVERTISING
4.00 Credits
Advertising as an integral part of the marketing process. An overview of agency operation, media strategy, print and electronic media, and copy creation and concepts. Cases are used to illustrate how organizations develop advertising strategies. An advertising plan must be developed for an organization using the principles of the course. Offered alternate years. Prerequisite: MRKT 351.

373 - LOGISTICS
4.00 Credits
Move-storage activities that are necessary to deliver products to the right place, at the desired time, in the appropriate condition and at the lowest cost. Warehousing, transportation, order processing, inventory and material handling are key topics. Emphasis is given to the development of decision skills that will provide the best minimum total cost service to the customer. Offered alternate years. Prerequisites: MGMT 333 and MRKT 351.

376 - BUSINESS TO BUSINESS MARKETING
4.00 Credits
Basic business marketing systems as distinguished from consumer marketing. Characteristics of manufacturer's goods, channels of distribution, pricing, vendor and value analysis, commercial buying, advertising, and meeting product specifications. Prerequisite: MRKT 351.

420 - INTERNSHIP IN MARKETING
4.00 to 16.00 Credits
Field experience in marketing. Graded S/U. Internship experiences can be repeated for a maximum of sixteen credit hours. Can be used only as general elective hours and can not be used to satisfy either marketing or business elective requirements. Consult advisor.

434 - MARKETING RESEARCH
4.00 Credits
Research design, data collection methods, sampling techniques, tabulation, analysis and presentation of information concerning problems in marketing. Provides a working knowledge of the concepts and methods of marketing research. Offered alternate years. Prerequisite: MRKT 351.

452 - CONSUMER BEHAVIOR
4.00 Credits
Determinants of behavior which influence the purchase of goods and services. Consumer characteristics, situation analysis and product attributes are key topics covered in this area of behavior. Sociological, cultural, psychological, economic and communication theories used to create unique marketing mixes for specialized target markets. Offered alternate years. Prerequisite: MRKT 351.

453 - INTERNATIONAL MARKETING
4.00 Credits
World markets, their respective consumers and environments, and the marketing management required to meet the demand of world markets in a dynamic and ever changing setting. Contrasting marketing in the United States with marketing in foreign countries. Case studies illustrate marketing problems faced by international marketers. Prerequisites: IBEC 300 and MRKT 351. (Also listed as IBEC 453.)

455 - ADVANCED MARKETING
4.00 Credits
Integrative capstone in marketing which brings together all of the functional areas of marketing and requires development of marketing strategies and their application to problem situations. A group case approach is used. Open to seniors only. Offered alternate years. Prerequisites: MRKT 351, 370 and 434; MGMT 333; and FINC 362.

493 - SPECIAL TOPICS IN MARKETING
1.00 to 4.00 Credits
Can be repeated as the topic varies.

496 – INDEPENDENT STUDY IN MARKETING
1.00 to 4.00 Credits
An exploration in depth of a subject of special interest to both the student and the faculty member. Can be repeated as the topic varies. 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 Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), the only official accrediting agency for engineering curricula, has accredited programs in civil, electrical, and mechanical engineering. The computer engineering program will be eligible for its first ABET accreditation review in 2000. 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.

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. The Electrical and Computer Engineering department was organized in 1998. Over 4,000 engineers have graduated from the Thomas Jefferson Smull College of Engineering. All programs 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.

The following faculty chairs have been established to enhance the educational tradition of the college.

Herbert F. Alter Chair of Engineering Science established in 1983 by Mrs. Alter in memory of her late husband, class of 1911 in mechanical engineering. The 1999-2000 recipient is Dr. F. Lee Grismore, professor of electrical and computer engineering.

Engineering Alumni Chair established in 1983 by donations from engineering alumni and friends in celebration of the college’s centennial year. The 1999-2000 recipient of the chair is Dr. Kanti Shah, professor of civil engineering.

Leroy H. Lytle Distinguished Chair of Mechanical Engineering established in 1983 from the estate of Leroy H. Lytle, 1923 graduate of ONU. The 1999-2000 recipient of the chair is Dr. Leo Maier, professor of mechanical engineering.

Departments

There are three departments in the College of Engineering: civil engineering, electrical and computer engineering, and mechanical engineering.

Mission Statement

The mission of the college of engineering of Ohio Northern University is to provide the highest quality undergraduate engineering education to our students. By instilling broad problem-solving and design skills while encouraging service to society, ethical behavior, and lifelong learning, we will graduate students that are highly regarded throughout their professional careers.

It is our vision to be recognized as a premier undergraduate engineering college.

Admission Standards

Early application is advisable. Students interested in engineering are 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, OH 45810.

In addition to the general requirements for admission to the University stated in this catalog, high school graduates and non-graduates must have 16 acceptable units of work. 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 0.5 units 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 entering the college of engineering must demonstrate a proficiency in mathematics. For students who test low in the math proficiency test or who want to increase their math skills, a math refresher course is offered.

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; "C-" is not acceptable.

**Degree Requirements**

**Bachelor of Science degree in civil, electrical and computer, or mechanical engineering.**

**General Education Requirements**

The following lists the prescribed general education courses required of all students.

**English**

- Writing 110 and 111

**Humanities and Social Sciences**


Two humanities courses, one of which must be 200-level or above, selected from ART 100, 310, 320, 330; COMM 105, 291; ENGL 204, 207, 208, 209, 219, 220, 260, 261, 262, 263; FREN 214, 215, 216, 310, 311, 312; GRMN 224, 225, 226, 261, 311, 312, 313, SPAN 244, 245, 246, 250, 341, 342, 353, 355; HIST 110, 111, 214, 215, 303, 365, 382, 383, 384, 451; HSPS 223; MUSC 100, 200, 210, 310; PHIL 100, 102, 237, 238, 310, 320, 325, 331, 340, 341, 343, 345.

Three social science courses, one of which must be 200-level or above, selected from ART 100, 310, 320, 330; COMM 105, 291; ENGL 204, 207, 208, 209, 219, 220, 260, 261, 262, 263; FREN 214, 215, 216, 310, 311, 312; GRMN 224, 225, 226, 261, 311, 312, 313, SPAN 244, 245, 246, 250, 341, 342, 353, 355; HIST 110, 111, 214, 215, 303, 365, 382, 383, 384, 451; HSPS 223; MUSC 100, 200, 210, 310; PHIL 100, 102, 237, 238, 310, 320, 325, 331, 340, 341, 343, 345.

An approved Honors Seminar may fulfill a requirement listed above.

**Bachelor of Science in Civil Engineering Curriculum**

**First Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Calculus 1, 2, 3, (MATH 163-164-165)</td>
<td>13</td>
</tr>
<tr>
<td>Physics: Mech. &amp; Lab (PHYS 231-34)</td>
<td>5</td>
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<tr>
<td>Physics: H/L/S &amp; Lab (PHYS 232-35)</td>
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<tr>
<td>Freshman Enrichment (GE 100.01)</td>
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<tr>
<td>Fundamentals of Engineering (GE 101)</td>
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</tr>
<tr>
<td>Engineering Problem Solving and CAD (GE 102)</td>
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<tr>
<td>Statics (GE 113)</td>
<td>4</td>
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<tr>
<td>Writing 1, 2 (ENGL 110-111)</td>
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**Second Year**

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<th>Course</th>
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<tr>
<td>Calculus 4 (MATH 263)</td>
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<tr>
<td>Linear Algebra (MATH 272)</td>
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<tr>
<td>Differential Equations (MATH 275)</td>
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<tr>
<td>Physics: E/M &amp; Lab (PHYS 233-36)</td>
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<tr>
<td>Chemistry (CHEM 162-3)</td>
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<td>Lab for CHEM 163 (CHEM 165)</td>
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<td>Dynamics (GE 214)</td>
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<td>Circuits 1 (GE 201)</td>
<td>5</td>
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<tr>
<td>Strength of Materials (GE 223)</td>
<td>4</td>
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<tr>
<td>Engineering Material Science (GE 243)</td>
<td>4</td>
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<tr>
<td>Surveying (GE 203)</td>
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<td><strong>TOTAL</strong></td>
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**Third Year**

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<tr>
<td>Numerical Methods (CE 313)</td>
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<tr>
<td>Environmental Science (CE 321)</td>
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<td>Geotechnical Engineering (CE 333)</td>
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<td>Structures 1.2 (CE 341-2)</td>
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<td>Reinforced Concrete Design (CE 343)</td>
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<td>Transportation 1.2 (CE 351-2)</td>
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<tr>
<td>Fluid Mechanics (CE 362)</td>
<td>4</td>
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<tr>
<td>Hydraulics (CE 363)</td>
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<tr>
<td>Statistics for Scientists and Engineers (MATH 380)</td>
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<td><strong>TOTAL</strong></td>
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**Fourth Year**

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<td>Project Management (CE 414)</td>
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<td>CE Design (CE 410)</td>
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<td>CE Project (CE 415)</td>
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<td>Soil Mechanics (CE 434)</td>
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<tr>
<td>Foundations (CE 438)</td>
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<td>Steel Design (CE 444)</td>
<td>5</td>
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<td>Transportation 3 (CE 456)</td>
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<tr>
<td>Hydrology (CE 464)</td>
<td>4</td>
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<td>Environmental Engineering 1 (CE 425)</td>
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<tr>
<td>CE Elective</td>
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<td>Ethics In Professional Life (PHIL 336)</td>
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<tr>
<td>General Education</td>
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<tr>
<td><strong>TOTAL</strong></td>
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</tr>
</tbody>
</table>
Bachelor of Science in Electrical and Computer Engineering Curriculum

The Electrical and Computer Engineering Department offers the degree Bachelor of Science in Electrical and Computer Engineering. Within that single degree, a student can take either an Electrical Engineering Major or a Computer Engineering Major. A list of suitable electives for both majors is available from the department office.

Electrical Engineering Major

First Year
Calculus 1, 2, 3 (MATH 163-64-65) 13 hours
Physics: Mech. & Lab (PHYS 231-34) 5 hours
Physics: H/L/S and Lab (PHYS 232-35) 5 hours
Freshman Enrichment (GE 100.02) 1 hour
Fund. of Engineering (GE 101) 3 hours
Engin. Prob. Solving & CAD (GE 102) 3 hours
Statics (GE 113) 4 hours
Writing 1, 2 (ENGL 110-11) 8 hours
Prin. of Microeconomics (IBEC 202) 4 hours
Religion Elective 4 hours
TOTAL 50 hours

Second Year
Linear Algebra (MATH 272) 4 hours
Discrete Math (MATH 336) 4 hours
Differential Equations (MATH 275) 5 hours
Physics: E/M & Lab (PHYS 233-36) 5 hours
Circuits 1, 2 (GE 201-02) 9 hours
Signals and Systems 1 (ECE 203) 4 hours
Ethics in Professional Life (PHIL 336) 4 hours
Programming 1 (ECE 164) 4 hours
Calculus 4 (MATH 263) 4 hours
Dynamics (GE 214) 4 hours
Social Science Elective 4 hours
TOTAL 50 hours

Fourth Year
Statistics for Engineers (MATH 380) 4 hours
Senior Design Seminar (ECE 404) 1 hour
Senior Design (ECE 405) 4 hours
Engineering Tech. Comm. (ECE 406) 3 hours
Digital Signal Processing (ECE 411) 4 hours
Engineering Methods (ECE 472) 4 hours
Control Systems 1, 2 (ECE 444-45) 8 hours
Commun. Systems 1, 2 (ECE 458-59) 8 hours
Technical Elective 4 hours
ECE Elective 3 hours
Humanities/Social Sciences 8 hours
TOTAL 51 hours

Computer Engineering Major

First Year
Calculus 1, 2, 3 (MATH 163-64-65) 13 hours
Physics: Mech. & Lab (PHYS 231-34) 5 hours
Physics: H/L/S and Lab (PHYS 232-35) 5 hours
Freshman Enrichment (GE 100.02) 1 hour
Fund. of Engineering (GE 101) 3 hours
Engin. Prob. Solving & CAD (GE 102) 3 hours
Statics (GE 113) 4 hours
Writing 1, 2 (ENGL 110-11) 8 hours
Prin. of Microeconomics (IBEC 202) 4 hours
Religion Elective 4 hours
TOTAL 50 hours

Second Year
Linear Algebra (MATH 272) 4 hours
Discrete Math (MATH 336) 4 hours
Differential Equations (MATH 275) 5 hours
Physics: E/M & Lab (PHYS 233-36) 5 hours
Circuits 1, 2 (GE 201-02) 9 hours
Signals and Systems 1 (ECE 203) 4 hours
Ethics in Professional Life (PHIL 336) 4 hours
Programming 1, 2, 3 (ECE 164-65-66) 12 hours
Assm Lang & Comp Org (ECE 264) 4 hours
TOTAL 50 hours

Third Year
Chemistry 1 (CHEM 162) 4 hours
Chemistry 2 and Lab (CHEM 163-65) 4 hours
Signals and Systems 2 (ECE 301) 4 hours
Filter Design (ECE 323) 4 hours
Digital Electronics (ECE 361) 5 hours
Microprocessors (ECE 362) 4 hours
Analog Electronics 1, 2 (ECE 321-22) 8 hours
Electromagnetics (ECE 331) 5 hours
Energy Conversion (ECE 332) 4 hours
Power Systems (ECE 333) 4 hours
Humanities Elective 4 hours
TOTAL 50 hours

Fourth Year
Chemistry 1 (CHEM 162) 4 hours
Chemistry 2 and Lab (CHEM 163-65) 4 hours
Signals and Systems 2 (ECE 301) 4 hours
Filter Design (ECE 323) 4 hours
Digital Electronics (ECE 361) 5 hours
Microprocessors (ECE 362) 4 hours
Adv. Digital Electronics (ECE 363) 4 hours
Data Structures (ECE 268) 4 hours
Computer Architecture (ECE 365) 4 hours
Operating Systems (ECE 466) 4 hours
Dynamics (GE 214) 4 hours
Social Science Elective 4 hours
TOTAL 49 hours
### Fourth Year

<table>
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<tr>
<th>Course</th>
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<tr>
<td>Statistics for Engineers (MATH 380)</td>
<td>4</td>
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<tr>
<td>Senior Design Seminar (ECE 404)</td>
<td>1</td>
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<tr>
<td>Senior Design (ECE 405)</td>
<td>4</td>
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<tr>
<td>Engineering Tech. Comm. (ECE 406)</td>
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</tr>
<tr>
<td>Digital Signal Processing (ECE 411)</td>
<td>4</td>
</tr>
<tr>
<td>Engineering Methods (ECE 472)</td>
<td>4</td>
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<td>Compilers (ECE 468)</td>
<td>4</td>
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<tr>
<td>Networks and Data Comm. (ECE 366)</td>
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<tr>
<td>Software Engineering (ECE 464)</td>
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<tr>
<td>Computer Device Lab (ECE 467)</td>
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<tr>
<td>Software Elective</td>
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<tr>
<td>Humanities/Social Sciences</td>
<td>12</td>
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<td>TOTAL</td>
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### Bachelor of Science in Mechanical Engineering Curriculum

#### First Year

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<th>Course</th>
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<tbody>
<tr>
<td>Calculus 1, 2, 3 (MATH 163-164-165)</td>
<td>13</td>
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<tr>
<td>Physics: Mech. &amp; Lab (PHYS 231-34)</td>
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<tr>
<td>Physics: H/L/S &amp; Lab (PHYS 232-35)</td>
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<tr>
<td>Freshman Enrichment (GE 100.03)</td>
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<tr>
<td>Fundamentals of Engineering (GE 101)</td>
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<tr>
<td>Engineering Problem Solving and CAD (GE 102)</td>
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<tr>
<td>Statics (GE 113)</td>
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<td>Writing 1, 2 (ENGL 110-11)</td>
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<td>Principles of Microeconomics (IBEC 202)</td>
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</tr>
<tr>
<td>General Education</td>
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</table>

#### Second Year

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Calculus 4 (MATH 263)</td>
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<tr>
<td>Linear Algebra (MATH 272)</td>
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</tr>
<tr>
<td>Differential Equations (MATH 275)</td>
<td>5</td>
</tr>
<tr>
<td>Physics: E/M &amp; Lab (PHYS 233-36)</td>
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<tr>
<td>Chemistry (CHEM 162-63)</td>
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<td>Lab for CHEM 163 (CHEM 165)</td>
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<tr>
<td>Dynamics (GE 214)</td>
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<tr>
<td>Circuits 1 (GE 201)</td>
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<td>Circuits 2 (GE 202)</td>
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<tr>
<td>Strength of Materials (GE 223)</td>
<td>4</td>
</tr>
<tr>
<td>Engineering Material Science (GE 243)</td>
<td>4</td>
</tr>
<tr>
<td>Computer Applications and Design (ME 202)</td>
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#### Third Year

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Process of Mech. Design (ME 311)</td>
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<tr>
<td>Adv. Strength of Materials (ME 319)</td>
<td>4</td>
</tr>
<tr>
<td>Manufacturing Processes (ME 341)</td>
<td>4</td>
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<tr>
<td>Mechanisms (ME 352)</td>
<td>5</td>
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<tr>
<td>Thermodynamics (ME 362)</td>
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<td>Thermodynamics of Fluids (ME 363)</td>
<td>5</td>
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<tr>
<td>Numerical Methods (ME 371)</td>
<td>4</td>
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<tr>
<td>Engineering Analysis (ME 382)</td>
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<tr>
<td>Finite Element Analysis (ME 383)</td>
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<tr>
<td>Public Speaking (COMM 211)</td>
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<tr>
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<tr>
<td>Statistics for Scientists and Engineers (MATH 380)</td>
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<td>TOTAL</td>
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#### Fourth Year

<table>
<thead>
<tr>
<th>Course</th>
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</tr>
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<tbody>
<tr>
<td>Capstone 1, 2, 3 (ME 411-2-3)</td>
<td>4</td>
</tr>
<tr>
<td>Mechanical Design of Components (ME 417)</td>
<td>4</td>
</tr>
<tr>
<td>Fluid Mechanics (ME 464)</td>
<td>5</td>
</tr>
<tr>
<td>Heat Transfer 1, 2 (ME 467-8)</td>
<td>9</td>
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<tr>
<td>Technical Elective</td>
<td>4</td>
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<tr>
<td>Control Systems (ME 419)</td>
<td>5</td>
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<tr>
<td>Vibration Analysis (ME 418)</td>
<td>4</td>
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<tr>
<td>Ethics in Prof. Life (PHIL 336)</td>
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<tr>
<td>General Education</td>
<td>12</td>
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<tr>
<td>TOTAL</td>
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</tbody>
</table>

* A student must receive a passing grade in courses that are listed for graduation.
** Students need to take the courses listed for their class level for the 2000-01 academic year. They are subject to change in subsequent years.

### Graduation Requirements

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 number of academic hours as defined by their particular program (approximately 200 academic hours). In addition, a student must attain at least a 2.00 accumulative grade point average in all courses and at least a 2.00 accumulative grade point average in all engineering courses.

All degree candidates are required to spend their senior year in academic residence.

At commencement engineering students receive the bachelor of science degree in either civil, electrical and computer, or mechanical engineering.
General Regulations

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 19 hours, whichever is largest. The dean, upon recommendation of the student’s advisor, may permit a student to enroll for extra hours at an additional charge. See page 18 for overload charges beyond 19 credit hours. The normal requirement is an accumulative average of at least 3.00/4.00. Except where noted, credit hours earned in repeated courses can be counted only one time among the total hours required for graduation.

S/U Grade Option

Students in the College of Engineering are not permitted to register for courses on an S/U (satisfactory/unsatisfactory) option basis if the course is offered on a graded basis.

Classification of Students

For purposes of classification, the minimum requirements for sophomore standing are 49 quarter hours of completed academic work; for junior standing, 98 quarter hours; and for senior standing, 147 quarter hours.

Academic Standing

A student is in good academic standing when the accumulative grade point average is equal to or greater than 2.00. When the accumulative grade point average falls below 2.00, a student is placed on probation. Normally, one quarter is given to raise the accumulative average to 2.00 or above. The status of probation may occur for two successive quarters if conditions and evidence indicate that the student is improving academically. Students on probation cannot participate in competitive activities of individuals, teams, or other groups officially designated as representing the University.

Any student on probation whose quarter grade point average for the following quarter is below 2.00 will have his/her record reviewed by the Committee on Academic Qualifications of the college and may be recommended to the dean for academic actions which may include suspension or dismissal. Unless otherwise indicated, suspension is for a period of three regular academic quarters. Students who have been suspended must petition the academic dean for lifting of the suspension.

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 senior year. Students may also write the Secretary of the State Board of Registration for Professional Engineers and Surveyors, 77 South High Street, 16th Floor, Columbus, OH 43266-0314.

Engineering Graduates and Law School

Graduating seniors of the Thomas Jefferson Smull College of Engineering who wish to enter the Pettit College of Law at Ohio Northern University are admitted if they (1) maintain an undergraduate grade point average of at least 3.2; (2) score at or above the 65th percentile on the LSAT; and (3) pass the character and fitness review by the Law School Admissions Committee.

Dual Degree Programs

Information concerning dual degree programs involving the College of Engineering appears on page 33 of this catalog. Students pursuing such a program are required to take advanced mathematics in the first year. Students may receive further details in the office of the dean of the college.

Cooperative Education Program

Cooperative education is a plan of educational development designed to integrate classroom study with planned and supervised work experiences. Engineering co-op students normally are employed in semiprofessional capacities in research, development, manufacturing, and engineering departments of industrial companies, consulting firms, and in federal and state agencies. The program also includes the opportunity for the students to work for an international firm in an international environment. The international co-op component is modified to include courses in the appropriate language and culture and a six-month overseas assignment during the junior year. The employment sessions begin in the summer following the sophomore year and include a contracted four to six terms of co-op experience. This five-year program is optional and currently available for civil, electrical and computer, and mechanical engineering students.
Interdisciplinary Programs

In addition to the regular degree programs in civil, electrical and computer, and mechanical engineering, several interdisciplinary programs have been developed. They are a Business Administration Minor or Option, a Computer Science Minor, a Bio-Medical Option, a Bio-Medical Sciences Minor, and an Environmental Option, among others. The Business Administration Option may be taken with any of the college of engineering degree programs. The Computer Science Minor is available to all except the ECE Computer Engineering major; the Bio-Medical Option is designed to be taken with either major of the electrical and computer engineering program; the Bio-Medical Sciences Minor is designed to be taken with the mechanical engineering program; and the Environmental Option complements the civil and mechanical engineering programs.

This is accomplished by proper planning and judicious use of social science and technical electives. Further, it is accomplished without a sacrifice in the engineering content of the three degree programs. In order to avoid scheduling conflicts, it is essential that the student follow the program as designated. A copy of each of the interdisciplinary programs may be obtained from the respective departmental offices. Any student may select one of the programs as an adjunct to the engineering degree program with the approval of the appropriate chair and the dean. In order for the student to continue on the program the accumulative average must be at least 2.50. Additional hours in the minor or option are required for graduation. Pursuit of an option or minor may involve several quarters where loads exceed 19 quarter hours and/or summer sessions. In such cases, a course overload fee is required for academic work in excess of 19 hours. (See page 18.) A minimum of 28 hours in the minor or option is required for graduation. The diploma does not indicate the minor or option; however, the transcript does show the appropriate program designation.

Courses required for the Business Administration Option are two courses in economics, two courses in accounting, one course in business law, and two business electives.

The Computer Science Minor requirements are determined by the Department of Computer Science.

The Bio-Medical Option requires a three-course sequence in introductory biology, zoology, and anatomy; a two course intermediate level sequence in anatomy/physiology; and two technical electives chosen from a specific list of possibilities. (Please contact the Electrical and Computer Engineering department office for the list of possible electives).

The Bio-Medical Sciences Minor requirements are determined by the Department of Biological Sciences.

The Environmental Option includes two courses in the biological sciences, two in chemistry and five courses in civil engineering which focus on various aspects of the environment.

GENERAL ENGINEERING COURSES

Subject - General Engineering (GE)

100 - FRESHMAN ENRICHMENT
1.00 Credit
The practices, methods, and procedures which are common to problems and designs encountered in engineering. To form a strong bond between the student and department and provide a forum for freshman advising. Graded S/U.

101 - FUNDAMENTALS OF ENGINEERING
(3+0)
3.00 Credits
Emphasis on the engineering profession. Includes computer skills, professionalism, ethics, applications of math and physics to engineering projects emphasizing working in teams.

102 - ENGINEERING PROBLEM SOLVING AND CAD (2+2)
3.00 Credits
Includes mechanical drawing techniques done by hand and using CAD. Teams work to complete a design project from proposal to presentation. Prerequisite: GE 101.

113 - STATICS (4+0)
4.00 Credits
Fundamental principles of statics with vector methods. Emphasis on free body diagrams and equations of equilibrium. Topics include resultants of force systems, centroids, centers of gravity, moments of inertia, equilibrium, shear and moment diagrams, loads, trusses, and internal forces. Prerequisites: MATH 163 and PHYS 231.

180 - SPECIAL TOPICS
.00 to 4.00 Credits
Selected topics of current interest in general engineering. Prerequisite: Permission of instructor.
190 - INDEPENDENT STUDY
1.00 to 4.00 Credits
Individual study of topic of particular interest to the student in general engineering. Prerequisite: Permission of instructor.

201 - CIRCUITS 1 (4+2)
5.00 Credits

202 - CIRCUITS 2 (3+2)
4.00 Credits

214 - DYNAMICS (4+0)
4.00 Credits
Fundamental principles of mechanics with vector methods as applied to dynamics. Topics include: kinematics, absolute and relative motion, force, mass and acceleration, work and energy, and impulse and momentum. Prerequisites: MATH 164 and GE 113.

223 - STRENGTH OF MATERIALS (4+0)
4.00 Credits
Elastic analysis of deformable bodies using concepts of stress and strain. Topics include: members subject to tension, compression, torsion, and flexure; development and application of Mohr’s circle, determinate beam deflection, material properties, pressure vessels, and composite beams. Prerequisite: GE 113.

243 - ENGINEERING MATERIAL SCIENCE (3+2)
4.00 Credits
Fundamental chemical, physical and microstructural characteristics of materials and how these relate to their mechanical behavior. Evaluation of these properties for material selection. Metallurgical aspects including equilibrium diagrams. Includes laboratory experiments in Mechanics of Materials and Material Science.

250 - ORIENTATION FOR CO-OP STUDENTS (1+0)
.00 Credits
An introduction to the co-op program. Includes an introduction to industry, the industrial work environment, resume writing, interviewing and job search techniques. Designed to prepare the sophomore engineering student for the industrial experience. Prerequisite: Sophomore standing. (Formerly GE 300)

280 - SPECIAL TOPICS
1.00 to 4.00 Credits
Selected topics of current interest in general engineering. Prerequisite: Permission of instructor.

290 - INDEPENDENT STUDY
1.00 to 4.00 Credits
Individual study of topic of particular interest to the student in general engineering. Prerequisite: Permission of instructor.

350 - PROFESSIONAL PRACTICE
1.00 Credit
Employment in a semi-professional capacity in a research, development, manufacturing, or engineering department of an industrial company, a consulting firm or a governmental agency. A student report on the assignment and an employer’s evaluation are required. May be repeated up to a total of six hours. Prerequisites: Junior standing, successful completion of GE 250, and CUM GPA of 2.5 minimum.

DEPARTMENT OF CIVIL ENGINEERING

Professors Milks, Shah, Smalley (Chair), Ward; Associate Professor Bazlamil

The mission of the civil engineering department is to provide a program of quality undergraduate education by which students are prepared for professional careers in civil engineering. Implementation of the mission is through departmental goals. By these goals, we seek the following:

• To provide a curriculum taught by a faculty distinguished by excellence in undergraduate teaching and active in the profession which prepares students for entry-level professional employment or advanced studies at the graduate level.

• To provide for areas of concentration, options, minors, and an opportunity for work experience through a cooperative education program.

• To provide for the development of the whole person through effective communication skills, higher level thinking skills, and a sensitivity for the social and humanistic implications of civil engineering projects.

The civil engineering curriculum combines a strong background in the fundamentals of engineering, science, and mathematics with a basic knowledge of civil engineering principles in the environmental, geotechnical, structural, transportation, and water resources areas. Classroom and laboratory activities are integrated to form a comprehensive experience of theory and practice. Problem solving and design concepts are emphasized.
Subject - Civil Engineering (CE)

203 - SURVEYING (2+4)
4.00 Credits
Plane surveying; use of level, tape, and total station; traversing, horizontal and vertical curves, and topographic mapping. Prerequisite: MATH 163.

313 - NUMERICAL METHODS (4+0)
4.00 Credits
Principles of numerical methods used in solving civil engineering problems. Topics include finite differences, finite elements, linear programming and optimization. Prerequisite: MATH 275.

321 - ENVIRONMENTAL SCIENCE (4+0)
4.00 Credits
Sources and characteristics of pollutants, their effects on the environment, humans, and animals. Emphasis placed on interdisciplinary approach to reduce and treat wastes. Prerequisite: Junior Standing.

323 - SOLID AND HAZARDOUS WASTE MANAGEMENT (4+0)
4.00 Credits
Sources and characteristics of solid and hazardous wastes: collection, transportation, disposal, and environmental laws. Selection of disposal sites and conceptual design of disposal facilities. Prerequisites: CHEM 163 and CE 321.

333 - GEOTECHNICAL ENGINEERING (3+2)
4.00 Credits
Principles of geologic processes and properties of earth materials as pertinent to civil engineering. Terrain and site investigation techniques. Physical and structural geology and geomorphology to the extent to which they influence the location, design, construction, and maintenance of engineering works. Prerequisite: CE 362.

341 - STRUCTURES 1 (4+2)
5.00 Credits
Analysis of determinant beams, trusses and frames. Topics include deflections, displacements, principle of superposition, moving loads, influence lines, cables and arches. Prerequisite: GE 223.

342 - STRUCTURES 2 (4+0)
4.00 Credits
Fundamentals of statically indeterminate structures using classical, approximate, and computer solutions. Prerequisite: CE 341.

343 - REINFORCED CONCRETE DESIGN (4+2)
5.00 Credits
Strength design of beams, columns, slabs, and footings using reinforced concrete. Application of ACI code and specifications to design including serviceability. Laboratory on concrete testing. Prerequisite: CE 341.

351 - TRANSPORTATION 1 (4+0)
4.00 Credits
Components of transportation systems; traffic flow modeling, geometric design of highways, horizontal and vertical curves, drainage and surface runoff using AASHTO procedures. Prerequisite: CE 203.

352 - TRANSPORTATION 2 (4+0)
4.00 Credits

362 - FLUID MECHANICS (3+2)
4.00 Credits
Principles of the mechanics of fluids: engineering properties of fluids, fluid statics, fluid dynamics by momentum and energy principles, steady flow in pipes and compressible flow. Prerequisite: GE 214.

363 - HYDRAULICS (3+2)
4.00 Credits
Hydraulic analysis of piping systems and hydraulic structures: flow analysis and measurement, friction losses, minor losses, pump design, and water hammer; dimensional analysis and similitude. A water distribution system design is a term project. Prerequisite: CE 362.

371 - URBAN PLANNING
4.00 Credits
Principles of city and regional planning; land use, zoning, subdivision regulations, metropolitan problems and urban development. Topics will cover applications in the transportation planning and the environmental areas. Prerequisite: Junior standing.

380 - SPECIAL TOPICS
1.00 to 4.00 Credits
Selected topics of current interest in civil engineering. Prerequisite: Permission of instructor.
390 - INDEPENDENT STUDY
1.00 to 4.00 Credits
Individual study of topic of particular interest to
the student in civil engineering. Prerequisite:
Permission of instructor.

410 - CE DESIGN SEMINAR
1.00 Credit
Engineering design process; selection of senior
design project; oral and written presentation of
project proposal. Prerequisite: CE senior
standing.

414 - PROJECT MANAGEMENT (3+2)
4.00 Credits
Principles of organization, management, and
control of civil engineering projects. Topics
include present and emerging legal and technical
issues, critical path methods, and engineering
economics. Prerequisite: Senior standing.

415 - CIVIL ENGINEERING DESIGN PROJECT
(0+6)
3.00 Credits
Capstone design project, under the specific
guidance of a civil engineering faculty member.
Prerequisite: CE 410.

425 - ENVIRONMENTAL ENGINEERING 1 (4+2)
5.00 Credits
Physical, chemical, and biological processes in
water and wastewater treatment systems and
their relationship to the environment. Prerequisite:
CE 363.

426 - ENVIRONMENTAL ENGINEERING 2 (4+0)
4.00 Credits
Advances in waste treatment, removal of specific
constituents. Effects and overview of the
available types of unit operations and processes.
Prerequisite: CE 425.

434 - SOIL MECHANICS (3+2)
4.00 Credits
Physical properties of soils as effecting design
and construction, mechanics of soil masses,
compaction, settlements, consolidation, and
laboratory soil tests. Prerequisites: CE 333 and
GE 223.

438 - FOUNDATIONS (4+0)
4.00 Credits
Analysis of stress conditions imposed on the
supporting soil by foundations. Design of
foundations, retaining structures, and slopes.
Prerequisites: CE 343 and CE 434.

444 - STEEL DESIGN (4+2)
5.00 Credits
Design of beams, columns, composite beams,
girders, and connections using structural steel.
Loads and material properties. Application of
AISC code and specifications to design.
Prerequisite: CE 342.

446 - STRUCTURAL DESIGN (4+0)
4.00 Credits
Design of structural projects. Prerequisites: CE
343 and 444.

456 - TRANSPORTATION 3 (3+2)
4.00 Credits
Design of pavements for transportation facilities;
material properties and their impact on pavement
design. Prerequisite: CE 352.

464 - HYDROLOGY (3+2)
4.00 Credits
Estimates of population, water usage, and
wastewater generation; the hydrologic cycle,
precipitation and streamflow data measurement
and analysis; runoff prediction, hydrographs,
flood routing, and open channel flow. A design
term project is required. Prerequisite: CE 362.

466 - WATER RESOURCES (3+2)
4.00 Credits
Continuation of open channel flow analysis with
sewer design and modeling water surface
profiles. Groundwater topics of confined and
unconfined aquifers, steady and unsteady
groundwater hydraulics, aquifer pumping tests,
and mathematical groundwater modeling.
Prerequisite: CE 464.

480 - SPECIAL TOPICS
1.00 to 4.00 Credits
Selected topics of current interest in civil
engineering. Prerequisite: Permission of
instructor.

490 - INDEPENDENT STUDY
1.00 to 4.00 Credits
Individual study of topic of particular interest to
the student in civil engineering. Prerequisite:
Permission of instructor.
The mission of the department is to provide excellence in an undergraduate electrical and computer engineering program which is grounded in fundamentals and structured to provide breadth of coverage. We will graduate students who can effectively contribute to their society through industry and the public sector, or who can distinguish themselves in graduate study.

In order to fulfill this mission, the department has established the following objectives:

- To maintain a faculty of high academic credentials who place an emphasis on the teaching function.
- To provide students with the tools an motivation for lifelong learning.
- To develop professional self-confidence in our students.
- To maintain a curriculum that is rich in laboratory and design experiences, and that responds to emerging technology and research in the field.

**Subject - Electrical and Computer Engineering (ECE)**

**164 - PROGRAMMING 1 (4+0)**

4.00 Credits

Basic programming techniques; simple data types, expressions, functions, conditionals, iteration, recursion, structured data types, etc. The use of high-level programming languages with a focus on simple algorithm development. (Formerly CS 134) (Also listed as CS 164)

**165 - PROGRAMMING 2 (4+0)**

4.00 Credits

Advanced programming topics; memory management, object-oriented programming, algorithm analysis, etc. Principles of software engineering with illustrations based on examples from central areas of computing science. Prerequisite: ECE 164. (Formerly CS 135) (Also listed as CS 165)

**166 - PROGRAMMING 3 (4+0)**

4.00 Credits

Continuation of topics from Programming 2 (ECE 165). System Life Cycle, library construction, recursion, abstract data types (stacks, queues, trees), searching and sorting. Prerequisite: ECE 165. (Formerly CS 136) (Also listed as CS 166)

**203 - SIGNALS AND SYSTEMS 1 (4+0)**

4.00 Credits

Linear time domain analysis techniques including impulse response and the superposition integral. Frequency domain analysis including LaPlace transform and Fourier series. Prerequisites: MATH 275 and GE 202. (Formerly EE 203)

**264 - ASSEMBLY LANGUAGE AND COMPUTER ORGANIZATION (4+0)**

4.00 Credits

Introduction to computer structure and machine language, assembly language programming, macros, program segmentation and linkage. Corequisite: ECE 166. (Formerly CS 234). (Also listed as CS 264)

**268 - DATA STRUCTURES (4+0)**

4.00 Credits

Emphasis on data abstraction as a primary tool in software construction. Use of modern programming language abstraction features to implement classical data structures; linear structures (lists, stacks, queues), tree structures (BTrees, AVLTrees, Splay Trees), hash tables and graphs. Introduction to space and time complexity analysis. Prerequisites: MATH 336 and ECE 166. (Formerly CS 248 and 338) (Also listed as CS 268)

**301 - SIGNALS AND SYSTEMS 2 (4+0)**

4.00 Credits

Continuous frequency domain analysis using the Fourier transform. Analysis of multiple input/output systems using state variables. Discrete time analysis using the Z-Transform. Prerequisite: ECE 203. (Formerly EE 301)

**321 - ANALOG ELECTRONICS 1 (3+3)**

4.00 Credits

Analysis and design of analog electronic circuits using semiconductor diodes, transistors and integrated circuits. Computer techniques will be combined with laboratory work for several projects during the quarter. Prerequisite: ECE 203. (Formerly EE 321)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>322</td>
<td>ANALOG ELECTRONICS 2 (3+3)</td>
<td>4.00</td>
<td>Continuation of Analog Electronics 1 (ECE 321). Prerequisite: ECE 321. (Formerly EE 322)</td>
</tr>
<tr>
<td>323</td>
<td>FILTER DESIGN (3+2)</td>
<td>4.00</td>
<td>Analysis and design of electronic filters including Butterworth and Chebyshev lowpass, highpass, bandpass and bandstop examples. Filters will be designed using several computer applications and evaluated via computer and laboratory measurements. Prerequisites: ECE 301 and 164. (Formerly EE 323)</td>
</tr>
<tr>
<td>331</td>
<td>ELECTROMAGNETICS (5+0)</td>
<td>5.00</td>
<td>An axiomatic approach to static electric fields, static magnetic fields and time varying fields leading to Maxwell’s equations. Fundamentals of analysis and design in electromagnetism with engineering application to transmission lines. Prerequisites: MATH 263 and PHYS 233. (Formerly EE 331)</td>
</tr>
<tr>
<td>332</td>
<td>ENERGY CONVERSION (3+3)</td>
<td>4.00</td>
<td>Analysis and design of electrical energy conversion systems emphasizing electromechanical devices, system representation, system analysis and system design. Prerequisites: GE 202 and ECE 331. (Formerly EE 332)</td>
</tr>
<tr>
<td>333</td>
<td>POWER SYSTEMS (3+3)</td>
<td>4.00</td>
<td>Continuation of ECE 332 including load flow and fault studies. Prerequisite: ECE 332. (Formerly EE 333)</td>
</tr>
<tr>
<td>361</td>
<td>DIGITAL ELECTRONICS (4+3)</td>
<td>5.00</td>
<td>Combinational logic and synchronous sequential system analysis and design. Definition and characterization of logic gates at the transistor level; Karnaugh maps; Moore and Mealy structures; state diagrams and state tables, application of ABEL and XACT software design tools. Characterization and synthesis with PLD and FPGA devices. Design projects. Integrated laboratory experimental activities. Prerequisites: MATH 336 and GE 202.</td>
</tr>
<tr>
<td>362</td>
<td>MICROPROCESSORS (3+3)</td>
<td>4.00</td>
<td>Microprocessors and embedded microprocessor system design. Microprocessor structure, registers, RAM and ROM addressing. Machine cycles and timing relationships. Input and output ports and addressing. Assembly level programming. Microcontroller structure, instruction set and programming. Use of development systems and design simulators. Embedded microcontroller design projects. Integrated laboratory experimental activities. Prerequisite: ECE 361. (Formerly EE 312 and 316)</td>
</tr>
<tr>
<td>363</td>
<td>ADVANCED DIGITAL ELECTRONICS (3+3)</td>
<td>4.00</td>
<td>Digital system design using VHDL. Highly project oriented. Top down design methodology. Design projects carried out at behavioral, data flow, and structural levels of abstraction. Use of industry standard CAE tools. Prerequisite: ECE 362. (Formerly EE 419)</td>
</tr>
<tr>
<td>365</td>
<td>COMPUTER ARCHITECTURE (4+0)</td>
<td>4.00</td>
<td>Aspects of computer hardware; computer arithmetic, microarchitecture design (both datapath and control unit), instruction sets, storage hierarchies. Introduction to system organization. Current families of microprocessors illustrating design tradeoffs. Prerequisites: ECE 264 and ECE 361. (Formerly CS 236 and CS 336) (Also listed as CS 365)</td>
</tr>
<tr>
<td>366</td>
<td>NETWORKS AND DATA COMMUNICATION (4+0)</td>
<td>4.00</td>
<td>WAN and LAN design and use. Network software, including the ISO/OSI standard. Network hardware, including the Ethernet and Token Ring network protocols. Prerequisite: ECE 365. (Formerly CS 346) (Also listed as CS 366)</td>
</tr>
<tr>
<td>380</td>
<td>SPECIAL TOPICS</td>
<td>0.00 to 4.00</td>
<td>Selected topics in electrical or computer engineering of current interest. Prerequisite: Permission of instructor. (Formerly EE 380)</td>
</tr>
<tr>
<td>390</td>
<td>INDEPENDENT STUDY</td>
<td>0.00 to 4.00</td>
<td>Individual study of topic, in electrical or computer engineering, of particular interest to the ECE student. Prerequisite: Permission of instructor. (Formerly EE 390)</td>
</tr>
</tbody>
</table>
404 - SENIOR DESIGN SEMINAR (1+0)  
1.00 Credit  
Characteristics of engineering design projects. Topics include research, project planning, reliability, safety, economics, design methodology, and liability. Formal project proposals and plans are written. Prerequisite: Senior standing. (Formerly EE 404)

405 - SENIOR DESIGN (4+0)  
4.00 Credits  
A comprehensive project relevant to electrical or computer engineering. Application of the engineering design principles studied in ECE 404. Students are expected to spend a minimum of 12 hours per week directed exclusively to project activities. Prerequisite: ECE 404. (Formerly EE 405)

406 - ENGINEERING TECHNICAL COMMUNICATION (3+0)  
3.00 Credits  
The presentation of technical information in both written and oral formats. Students will use projects of ECE 405 as sources of material for presentations. Prerequisite: ECE 405. (Formerly EE 406)

411 - DIGITAL SIGNAL PROCESSING (3+2)  
4.00 Credits  
Analysis and design of discrete time systems including FIR and IIR digital filters. Discrete time systems will be evaluated using several computer applications as well as dedicated hardware systems. Prerequisite: ECE 323. (Formerly EE 411)

416 - ADVANCED TOPICS IN DSP (2+2)  
3.00 Credits  
Application of digital signal processing to speech and image data using a variety of computer tools and hardware systems. Projects requiring the design of processing systems for speech and/or image data will be required. Prerequisite: ECE 411. (Formerly EE 416)

423 - ELECTRONIC MATERIALS AND DEVICES (2+3)  
3.00 Credits  
Properties of solid state materials as they relate to practical devices and device characteristics. Semiconductor, dielectric and magnetic properties and devices are studied. Prerequisites: MATH 275 and PHYS 233. (Formerly EE 423)

433 - ADVANCED TOPICS IN ENERGY CONVERSION (3+0)  
3.00 Credits  
Analysis and design of commercial and industrial power systems. Prerequisite: ECE 332. (Formerly EE 433)

444 - CONTROL SYSTEMS 1 (3+3)  
4.00 Credits  
Classical feedback control systems. Modeling and transfer function formulation of PID controllers. Second-order system. Routh stability criteria. Steady-state error analysis. Computer simulation. Integrated laboratory experience. Prerequisites: ECE 301 and ECE 332. (Formerly EE 444)

445 - CONTROL SYSTEMS 2 (3+3)  
4.00 Credits  

446 - ADVANCED TOPICS IN CONTROL SYSTEMS (3+0)  
3.00 Credits  
Selected advanced topics in Control Systems. Prerequisite: ECE 445. (Formerly EE 446)

458 - COMMUNICATION SYSTEMS 1 (3+3)  
4.00 Credits  
Analysis and design of Analog Communication Circuits. Prerequisites: ECE 301 and 322. (Formerly EE 458)

459 - COMMUNICATION SYSTEMS 2 (3+3)  
4.00 Credits  
Performance measures for analog systems with noise. Analysis and design of Digital Communications Systems using statistical methods. Prerequisite: ECE 458. (Formerly EE 459)

464 - SOFTWARE ENGINEERING (4+0)  
4.00 Credits  
The methodologies used to design, create, evaluate and maintain software systems including coverage of several modern methodologies with emphasis on one. A project written in a modern software development environment will be developed. Prerequisites: CS 228 or ECE 268. (Formerly CS 434)(Also listed as CS 464)
466 - OPERATING SYSTEMS (4+0)  
4.00 Credits  
Operating system principles; multiprogramming, virtual memory, client-server models for operating systems. Prerequisite: ECE 268. (Formerly CS 436)(Also listed as CS 466)

467 - COMPUTER DEVICE LABORATORY  
(3+3)  
4.00 Credits  
Synchronous and asynchronous bus design. Motherboard implementation issues, clock skew, power dissipation. Device interfacing and device operation. Prerequisite: ECE 365. (Also listed as CS 467)

468 - COMPILERS (4+0)  
4.00 Credits  
Scanning; parsing, type checking for strongly typed languages; symbol table generation and maintenance; code generation for simple instruction sets. Prerequisite: ECE 268. (Formerly CS 438)(Also listed as CS 468)

472 - ENGINEERING METHODS (4+0)  
4.00 Credits  
Decision making based on criteria of economic factors including present worth, final worth, internal rate of return, cost benefit ratio, depreciation, taxes and others. Prerequisite: ECE senior standing. (Formerly EE 472)

480 - SPECIAL TOPICS  
.00 to 4.00 Credits  
Selected topics in electrical or computer engineering of current interest. Prerequisite: Permission of instructor. (Formerly EE 480)

490 - INDEPENDENT STUDY  
.00 to 4.00 Credits  
Individual study of a topic in electrical or computer engineering of particular interest to the ECE student. Prerequisite: Permission of instructor. (Formerly EE 490)

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DEPARTMENT OF MECHANICAL ENGINEERING

Professors Maier (Chair), Rider; Associate Professor Marquart; Assistant Professors Ferro, Laird, Waldron

Vision Statement  
To be a premier undergraduate mechanical engineering department preparing graduates for post-graduate studies and successful life-long careers in the service of society.

Mission Statement  
The mission of the mechanical engineering department shall be the continuous pursuit of excellence by providing quality mechanical engineering education founded in science and mathematics. Graduates shall have the abilities to work logically, accurately, and efficiently, and to continue to enhance their careers through life-long learning. They will be inspired with a desire to contribute positively to humanity and the environment. The students will be provided with the best teaching methods, facilities, and state-of-the-art technologies available.

A description of the general educational objectives is available in the department office.

Mechanical engineering is very broad in scope and most versatile in the engineering profession. It utilizes a combination of human, material, and economic resources to translate ideas and theories into realistic solutions to satisfy the needs of society. Technical activities include the generation of energy, the conversion of energy from one form to another, and the conservation of energy. Another activity is the control of various processes. Other activities are the design, manufacture, testing, and evaluation of various mechanical components and systems.

Studies in the humanities and social sciences serve to not only meet the objectives of a broad education, but also to meet the objectives of the engineering profession. Therefore, studies in the humanities and social sciences must be planned to reflect a rationale or fulfill an objective appropriate to the engineering profession and the university’s educational objectives.

Engineering sciences provide a bridge between mathematics and the basic sciences on the one hand and engineering practice on the other. Such subjects include mechanics, thermodynamics, electrical and electronic circuits, materials science, and computer science.

Fundamental elements of the design process are the establishment of objectives and criteria, innovation and creation, research, synthesis, analysis, construction, testing, and evaluation. This culminates in a required comprehensive design experience which is satisfied
by a yearlong senior capstone project. Engineering sciences and engineering design subjects are developed and integrated throughout the curriculum and consistent with the objectives of the program. A description of how this is done is available in the department office.

The mechanical engineering program contains a significant laboratory component which is closely correlated to the lectures. They provide the opportunity for individual as well as group projects and limited undergraduate research. Computers are integrated throughout the mechanical engineering curriculum. IBM-compatible, Macintosh, and UNIX workstations microcomputers are incorporated into the laboratories along with data acquisition equipment.

Subject - Mechanical Engineering (ME)

202 - COMPUTER APPLICATIONS AND DESIGN (3+2)
4.00 Credits
The techniques involved in designing, implementing and testing computer programs and data acquisition systems. Computer programming in the FORTRAN language will be taught, as well as computer graphics fundamentals. An introduction to the instruments and software used in data acquisition, including pressure transducers, thermocouples, strain gages, etc. will be included. Prerequisite: GE 102.

311 - PROCESS OF MECHANICAL DESIGN (4+0)
4.00 Credits
Project management and DOE are stressed. QFD, DFMA, FMEA, FTA, and other tools developed. Design teams work on project. Prerequisite: GE 223. (Formerly ME 414)

319 - ADVANCED STRENGTH OF MATERIALS (4+0)
4.00 Credits
Mechanics of materials such as composites, linear elastic fracture mechanics, behavior of plastic materials, and initially-curved beams. Prerequisite: GE 223. (Formerly ME 321)

341 - MANUFACTURING PROCESSES (3+2)
4.00 Credits
The course is centered in manufacturing and materials processing topics including traditional metal forming operations (welding, forging, casting, machining, etc.) and advanced methods. Subject areas include silicon processing, powder processes, plastic injection, carbon-carbon composites, extractive metallurgy, solidification, corrosion and SPC. Laboratory work includes operation of metal fabrication equipment (mill, drill, lathe, welding) and industrial lasers. Visits to local manufacturing plants included. Prerequisite: GE 243

352 - MECHANISMS (4+3)
5.00 Credits
Kinematics and kinetics of mechanisms, analysis and synthesis of linkages, cams, gears, and robots. Prerequisites: MATH 272 and GE 214.

362 - THERMODYNAMICS (4+0)
4.00 Credits

363 - THERMODYNAMICS OF FLUIDS (4+2)
5.00 Credits
Applications of the fundamentals of thermodynamics and the development of fluid mechanics principles. Investigation of heat pump, refrigeration and various power systems. The principles of static fluids will be developed, including buoyancy and incompressible, inviscid flow. Nonreacting and reacting gas mixtures and combustion will be addressed. Prerequisite: ME 362.

371 - NUMERICAL METHODS (4+0)
4.00 Credits
Numerical methods applicable to problems arising in engineering practice; exact and approximate solutions investigated; finite methods used for linear and nonlinear equation solution; ordinary and partial differential equations treated. Fortran 77 programs designed. Prerequisites: MATH 272 and 275; ME 202.

380 - SPECIAL TOPICS
1.00 to 5.00 Credits
Selected topics of current interest in mechanical engineering. Prerequisite: Junior status.

382 - ENGINEERING ANALYSIS (4+0)
4.00 Credits
Solution of open-faced engineering problems (engineering design) using professional method. Emphasis placed on learning to deal with new situations in terms of fundamental mathematics, science, and engineering principles. Prerequisites: MATH 275 and GE 214.

383 - FINITE ELEMENT ANALYSIS (3+2)
4.00 Credits
The finite element method techniques are studied. These techniques are used to solve engineering continuum problems, both “by hand” and using the general purpose FEA package, ANSYS, on the Silicon Graphics Workstations. Applications to engineering design of static and dynamic structures, as well as thermal systems. Prerequisites: GE 223 and ME 371.
390 - INDEPENDENT STUDY
1.00 to 5.00 Credits
Individual study of topic of particular interest to the student in mechanical engineering.

411 - CAPSTONE 1 (0+3)
1.00 Credit
Initiation of capstone design project as a team effort. Prerequisite: ME 311.

412 - CAPSTONE 2 (0+3)
1.00 Credit
Continuation of capstone design project as a team effort. Prerequisite: ME 411.

413 - CAPSTONE 3 (0+6)
2.00 Credits
Completion of capstone design project as a team effort. Prerequisite: ME 412.

417 - MECHANICAL DESIGN OF COMPONENTS (4+0)
4.00 Credits
Design and selection of various machine elements. Design teams work on a project. Prerequisite: ME 319. (Formerly ME 313)

418 - VIBRATION ANALYSIS
4.00 Credits
Fundamentals of linear vibration includes damped and undamped systems, single and multi-degree of freedom systems, and free or forced vibration. Prerequisites: MATH 275 and GE 214. (Formerly ME 315)

419 - CONTROL SYSTEMS (4+2)
5.00 Credits
Modeling, analysis and design of linear feedback control systems. Laplace transforms, transfer functions and frequency response. Introduction to digital controls and logic. Laboratory work in digital logic design, and performance studies of real systems. Prerequisite: Math 275 and ME 202. (Formerly ME 316)

429 - APPLICATIONS IN CONTROL SYSTEMS (3+2)
4.00 Credits
Applications in control systems concentrating on PLCs and ladder logic. Advanced control theory explored. Laboratory work concentrates on PLC applications. Prerequisite: ME 419.

442 - MANUFACTURING SYSTEMS (3+2)
4.00 Credits
The problems associated with manufacturing and solutions to some of these problems. Includes planning for system change and the application of computer integrated manufacturing. Prerequisite: ME 341.

462 - COMPUTATIONAL FLUID DYNAMICS (3+2)
4.00 Credits
The theory and methods of computational fluid dynamics, including grid generation, flow solution and post processing analysis. Implicit and explicit methods are studied, as well as direct and iterative solution techniques, and stability criteria. Students develop their own computer programs, as well as working with established computer codes. Prerequisites: ME 371 and 464.

464 - FLUID MECHANICS (4+2)
5.00 Credits
Fundamentals of incompressible and compressible, viscous and inviscid flows. Application to external and internal flow configurations in the fields of fluid mechanics and aerodynamics. Introduction to computational fluid dynamics. Analysis and design of piping systems, pump design and selection. Concurrent laboratory experience with flow and property measurement, pumps and piping systems. Prerequisites: MATH 275 and ME 363.

467 - HEAT TRANSFER 1 (4+0)
4.00 Credits
Heat conduction in steady and nonsteady state in one and two dimensions; thermal radiation concepts and heat exchangers. Graphical, numerical and electrical analog methods of solutions. Prerequisites: MATH 275 and PHYS 232.

468 - HEAT TRANSFER 2 (4+2)
5.00 Credits
Fundamentals of free and forced convection. Analytical and empirical convection correlations for internal and external theory to design. Laboratory reinforced study of conduction, flows. Condensation and boiling theories and their effects on heat transfer. Heat exchanger design and analysis. Thermal radiation through absorbing, emitting media. Application of theory to design. Laboratory reinforced study of conduction, convection, radiation and design. Prerequisite: ME 467.

480 - SPECIAL TOPICS
1.00 to 5.00 Credits
Selected topics of current interest in mechanical engineering. Prerequisite: Junior or senior status.

490 - INDEPENDENT STUDY
1.00 to 5.00 Credits
Individual study of a topic of a particular interest to a student in mechanical engineering. Prerequisite: junior or senior status.
The Raabe College of Pharmacy at Ohio Northern University endeavors today to meet the high standards of education demanded by the health professions. The college occupies a modern building designed and equipped to provide the facilities required for programs in the health sciences.

Throughout its more than 115-year history, the Ohio Northern University College of Pharmacy has played an important role in pharmaceutical education. Its position in Ohio is particularly significant. Over 6,750 pharmacists have been graduated by this institution and its graduates are particularly active in local, state, and national health-related organizations.

The Pharmacy Alumni Endowed Chair was established in 1984 through the generosity of pharmacy alumni and friends in celebration of the centennial of the college.

Accreditation and Affiliations

The Raabe College of Pharmacy’s Baccalaureate in Pharmacy and Doctor of Pharmacy programs are accredited by the American Council on Pharmaceutical Education (ACPE). Both pharmacy degrees are recognized by the Board of Pharmacy of the State of Ohio as meeting the educational requirement for licensure examination. The College of Pharmacy is a member of the American Association of Colleges of Pharmacy, and the Council of Ohio Colleges of Pharmacy.

Departments

Department of Pharmacy Practice (PHPR)
Department of Pharmaceutical and Biomedical Sciences (PHBS)

Mission Statement

The mission of the College of Pharmacy is to prepare students to enter the practice of pharmacy so they may contribute effectively to their profession. The college is responsible for generating and disseminating new knowledge about drugs and pharmaceutical care systems.

Context of statement: The college is responsible for educating well-rounded individuals with the ability to adapt to the changing profession. The educational process includes the scientific fundamentals necessary to adapt to future careers in the changing profession, the values necessary to serve society, the development of problem-solving and communication skills, and practice experience.

The faculty accept their role in teaching, conducting basic and applied research and providing service to the profession.

Admission Standards

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 or his designate.

High School Graduates. It is recommended that high school graduates should have completed the college preparatory course including four units of English, four units of mathematics (algebra I and II, plane geometry, trigonometry or precalculus, or calculus) and four units of science (biology, chemistry, and physics) and six units of history, social studies, languages or any combination thereof. Priority may 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 authenticated academic transcripts from all institutions attended. Credit will be allowed for any course in which a grade of C or better was received provided such work is parallel to the requirements for graduation from this institution (grades of C- are not transferable). Grades of P (passing) or S (satisfactory) are accepted when the academic institution certifies their equivalence to a C or better. Approval for admission and advanced placement will be determined upon review of the student’s previous record. Students entitled to advanced standing may enter at the time approved by the dean of the College of Pharmacy.
Doctor of Pharmacy Degree Requirements

The Doctor of Pharmacy degree is an advanced professional program that provides a foundation in the basic sciences of pharmacy as well as a comprehensive understanding of health care settings. Specifically, the graduate will have training in clinical skills which will allow entry into advanced practice settings. The program of study leading to the degree of Doctor of Pharmacy is a combination of general education courses, basic sciences, professional pharmacy courses and electives.

This program requires a minimum of 324 quarter hours of study divided according to the following:

General education courses 48 hours
Basic science courses 70 hours
Professional courses 183 hours
Electives 23 hours

General Education Requirements. The liberal studies component of the pharmacy degree curriculum consists of 48 quarter hours and intends to contribute significantly to the student’s becoming an educated professional and a responsible citizen. These foundation courses provide the background for advanced education and are listed under the common discipline areas of communication competence, culture and society, aesthetic sensibility, and human values.

Communication Competence
Writing 110
Writing 111
Public Speaking 211 or Interpersonal Communication 225

Culture and Society
Great Works of Literature 204
Western Civilization 110 or 111
Psychology 100
Sociology 105
Economics 100
One course in non-Western culture

Aesthetic Sensibility
Art 100 or Music 100 or Theatre 105

Human Values
Religions East and West 107 or Religion 105
Ethics 238 or Ethics in Professional Life 336

An approved Honors Seminar may fulfill a requirement listed above.

Basic Science Requirements. Basic sciences are needed in the pharmacy curriculum to provide not only the background required for professional pharmacy courses but also to contribute to developing a scientific literacy necessary to function in an increasingly complex and technical world.

Introductory Chemistry 171, 172, 173
Organic Chemistry 251, 252, 253 (with laboratories)
General Biology 121
Introduction to Zoology 122
Introduction to Human Anatomy and Histology 124
Physiology 331, 332, 333
Biosciences Laboratory 322, 323
Microbiology 313
Calculus for Life Sciences 1 154
Biostatistics 1 156
Biostatistics 2 256
Physics 120

Professional Pharmacy Requirements.
Courses in pharmaceutical and biomedical sciences, and pharmacy practice are designed to prepare students to meet the intellectual standards that are expected of the modern pharmacist, including the high ethical behavior that American society envisions.

Pharmaceutical and Biomedical Sciences
Biochemistry 341, 342
Immunology 375
Pharmaceutical Sciences Modules 431, 432
Biomedical Sciences Modules 443, 444

Pharmacy Practice
The Profession of Pharmacy 1, 2, 3 101, 102, 103
The Profession of Pharmacy 4, 5, 6 201, 202, 203
The Profession of Pharmacy 7, 8, 9 301, 302, 303
Introduction to OTC Products 331
Patient Care Assessment Modules I, II 401, 402
Cardiovascular System Module 441
Infectious Disease Module 442
Central Nervous System Module 543
Endocrine System Module 544
Oncology Module 545
Pharmaceutical Administration Module 550
Capstone 546 (Pharm.D.)
Clerkship Rotations 650 (Pharm.D.)

Electives
Elective course hours for the pharmacy program may be selected from courses in Arts and Sciences, Business Administration, and the College of Pharmacy. Students may plan elective courses for personal enrichment or to satisfy a minor or a second major.
### Doctor of Pharmacy Degree Curriculum

#### First Year
- **Introductory Chemistry 1, 2, 3**
  - 171, 172, 173  
  - 15 hours
- **General Biology 121**
  - 4 hours
- **Introduction to Zoology 122**
  - 4 hours
- **Introduction to Human Anatomy and Histology 124**
  - 4 hours
- **Calculus for Life Sciences 1 154**
  - 4 hours
- **Biostatistics 1 156**
  - 4 hours
- **The Profession of Pharmacy 1, 2, 3**
  - 101, 102, 103  
  - 3 hours
- **General Education/Electives**
  - 16 hours
- **TOTAL**
  - 54 hours

#### Second Year
- **The Profession of Pharmacy 4, 5, 6**
  - 201, 202, 203  
  - 6 hours
- **Organic Chemistry 1, 2, 3**
  - 251, 252, 253 (with laboratories)  
  - 12 hours
- **Physics 120**
  - 4 hours
- **Biostatistics 2 256**
  - 4 hours
- **General Education/Electives**
  - 28 hours
- **TOTAL**
  - 54 hours

#### Third Year
- **The Profession of Pharmacy 7, 8, 9**
  - 301, 302, 303  
  - 6 hours
- **Biochemistry 1, 2 341, 342**
  - 8 hours
- **Microbiology 313**
  - 4 hours
- **Introduction to OTC Products 331**
  - 3 hours
- **Immunology 375**
  - 4 hours
- **Physiology 1, 2, 3 331, 332, 333**
  - 9 hours
- **Biosciences Laboratory 1, 2 322, 323**
  - 2 hours
- **General Education/Electives**
  - 18 hours
- **TOTAL**
  - 54 hours

#### Fourth Year
- **Pharmaceutical Sciences Modules 1, 2**
  - 431, 432  
  - 16 hours
- **Biomedical Sciences Modules 1, 2 443, 444**
  - 16 hours
- **Patient Care Assessment Modules I, II 401, 402**
  - 4 hours
- **Cardiovascular System Module 441**
  - 9 hours
- **Infectious Disease Module 442**
  - 9 hours
- **TOTAL**
  - 54 hours

#### Fifth Year
- **Central Nervous System Module 543**
  - 9 hours
- **Endocrine System Module 544**
  - 9 hours
- **Oncology Module 545**
  - 9 hours
- **Pharmaceutical Admin. Module 550**
  - 9 hours
- **Bach. of Sci./Pharmacy Experiential Module 570**
  - 18 hours
- **TOTAL**
  - 54 hours

#### Sixth Year
- **Clerkship Rotations 650**
  - 54 hours

### Bachelor of Science in Pharmacy Degree Requirements

The Bachelor of Science in Pharmacy degree is a five-year curriculum that provides a foundation in the basic sciences of pharmacy as well as a comprehensive understanding of the practice of pharmacy.

The program of study leading to the degree of Bachelor of Science in Pharmacy requires a minimum of 256 quarter hours of study, and is a combination of general education courses, basic sciences and professional pharmacy courses. The 256 quarter hours are divided according to the following:

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General education courses</td>
<td>48</td>
</tr>
<tr>
<td>Basic science courses</td>
<td>70</td>
</tr>
<tr>
<td>Professional courses</td>
<td>138</td>
</tr>
</tbody>
</table>

*for students who entered Fall 1998 and Fall 1999.

#### Second Year
- **Same as the Pharm.D. curriculum**
- **General Education/Electives**
  - 26 hours
- **TOTAL**
  - 52 hours

#### Third Year
- **Same as the Pharm.D. curriculum**
- **General Education/Electives**
  - 6 hours
- **TOTAL**
  - 42 hours

#### Fourth Year
- **Same as the Pharm.D. curriculum**
- **TOTAL**
  - 54 hours

#### Fifth Year
- **Central Nervous System Module 543**
  - 9 hours
- **Endocrine System Module 544**
  - 9 hours
- **Oncology Module 545**
  - 9 hours
- **Pharmaceutical Admin. Module 550**
  - 9 hours
- **Bach. of Sci./Pharmacy Experiential Module 570**
  - 18 hours
- **TOTAL**
  - 54 hours

### Doctor of Pharmacy (Non-Traditional) Admission Requirements

Applicants seeking admission to the non-traditional doctor of pharmacy program must meet the following criteria:

1. Hold a baccalaureate degree in pharmacy from an accredited U.S. college of pharmacy.
2. Have a minimum of two years of practical experience as a pharmacist.
3. Hold a current, valid pharmacist license.
4. Have no disciplinary actions taken against the pharmacist's license by any State Board of Pharmacy.
Each applicant must submit an application form accompanied by a photocopy of a current valid pharmacist license, three letters of recommendation, and current résumé. Non-ONU graduates or those having completed academic work at another institution must also include an official transcript issued directly to the registrar’s office.

**Doctor of Pharmacy (Non-Traditional) Degree Requirements**

The non-traditional doctor of pharmacy degree has been developed to meet the needs of pharmacists who are unable to return to campus as full-time students. The program of study is comprised of 39 quarter hours of didactic course work and 30 hours of clerkships (6) for a total of 69 hours. A pharmacist, enrolled in the program, will have a maximum of three years to complete the didactic courses and a maximum of five years to complete the program.

**Non-Traditional Doctor of Pharmacy Degree Curriculum**

Orientation to Doctor of Pharmacy 701 0 hours  
Biostatistics 710 3 hours  
Drug Literature Evaluation 720 3 hours  
Pharmacokinetics 730 3 hours  
Physical Assessment 740 3 hours  
Pathophysiology and Therapeutics  
Cardiology 750 3 hours  
Renal 755 3 hours  
Infectious Disease 760 3 hours  
Central Nervous System/Psychiatric 765 3 hours  
Respiratory 770 3 hours  
Endocrine 775 3 hours  
GI Tract/Nutrition 780 3 hours  
Oncology 785 3 hours  
Dermatology/Ophthalmic 790 3 hours  
Clerkship in Pharmacy Practice 800 30 hours  
**TOTAL** 69 hours

**Requirements for Graduation**

*Each candidate for a Bachelor of Science in Pharmacy degree must:*

1. be of good moral character.  
2. have completed the required curriculum of 256 (255 if entered prior to Fall 1998) quarter hours.  
3. have earned a cumulative grade point average of 2.00 in all course work.  
4. have successfully completed (based on the General Administrative and Academic Regulations) the Pharm. D. curriculum as outlined on page 201.  
5. satisfy a minimum residency requirement as established by the dean of the college.  
6. be recommended for the degree by a majority vote of the faculty of the university.  
7. meet such other qualifications as the faculty of the college may determine.

*Each candidate for a Doctor of Pharmacy degree must:*

1. be of good moral character.  
2. have completed the required curriculum of 324 credit hours.  
3. have earned a cumulative grade point average of at least 2.00 in all course work.  
4. have successfully completed (based on the General Administrative and Academic Regulations) the Pharm. D. curriculum as outlined on page 201.  
5. satisfy a minimum residency requirement as established by the dean of the college.  
6. be recommended for the degree by a majority vote of the faculty of the university.  
7. meet other such qualifications as the faculty of the college may determine.

**Doctor of Pharmacy (Non-traditional) Degree for ONU Bachelor of Pharmacy Graduates (May 2000-2005)**

This non-traditional Doctor of Pharmacy degree has been developed to meet the needs of ONU Bachelor of Pharmacy graduates, between May 2000 and May 2005, who return to complete the entry level Pharm.D. degree requirements. The program of study is comprised of up to an additional 15 didactic hours, on campus, and 54 hours of clerkships (9) for a combined total of 324 quarter hours. A licensed pharmacist, enrolled in the program, will have a maximum of five (5) years to complete the program.
A pharmacist accepted into the program:
1. must have completed the modular didactic curriculum and graduated from Ohio Northern University with a Bachelor of Science in Pharmacy between May 2000 and May 2005.
2. must successfully complete (grade of “C” or better) the on campus Spring quarter Capstone 546 module (9 hours) and electives (up to 6 hours) to equal a total of 270 quarter hours.
3. must successfully complete the prescribed full-time clerkship (PHPR 650) rotations over a time period not to exceed five (5) years from the starting date.
4. may challenge out of a clerkship rotation by following the University/College guidelines for course challenge.
5. meet the criteria for graduation as outlined below:
   a. be of good moral character;
   b. have completed the required curriculum as described in 2 and 3 above.
   c. have earned a cumulative grade point average of 2.00 in all courses. Previous grade point average is not included.
   d. be recommended for the degree by a majority vote of the faculty of the university.

General Administrative and Academic Regulations

General administrative and academic regulations for the College of Pharmacy are established by the dean and faculty of the college to assist students as they select courses and attempt to fulfill graduation requirements. Additional regulations may be adopted during the academic year or changes may be made to the following:
1. Students who wish to register for more than 19 hours of academic studies in a single quarter need the written permission of the dean of the College of Pharmacy.
2. A pharmacy student may take no more than eight quarter hours in any summer term with a maximum of twenty quarter hours, total, for all three summer terms.
3. A prerequisite for a Bach. of Sci./ Pharmacy Experiential Module (PHPR 570) and the clinical clerkship rotations is a certificate of registration as an Ohio pharmacy intern. The Ohio Board of Pharmacy may deny the issuance of the certificate if an individual has been convicted of a felony, has been convicted of violating any state or federal pharmacy or drug law, is not of good moral character and habits, is addicted to or abusing liquor or drugs, has been disciplined by the Ohio Board of Pharmacy pursuant to section 4729.16 of the revised code, or has been disciplined by any board of pharmacy (OAC 4929-5-04).
4. Students registered for a Bach. of Sci./ Pharmacy Experiential Module (PHPR 570) who wish to register for any additional
required or elective courses need the written permission of both experiential instructors, the department chair (of PHPR), and the dean of the College of Pharmacy prior to registering for the additional courses.
5. Students should not expect to register for courses that have conflicting time schedules. On rare occasions a student may be allowed to do so. The student will need the written permission of both the faculty members and the dean of the College of Pharmacy. Permission is never given to allow a student to recover from a bad grade, whether the need for a time conflict is created directly or indirectly.
6. Students are encouraged to register for activity courses in art, music, theatre, and health and physical education. There is no maximum number of activity course credits that may be used for fulfilling elective graduation requirements.
7. A. Beginning 9-1-95, all grades earned in required BSPC, PHPR and PHBS courses will be averaged with all subsequent grades in those courses for the calculation of the student's cumulative grade point average (GPA).
B. Beginning 9-1-95, students will have a maximum of three (3) opportunities (two repeat attempts) to earn a “C” or better grade in the following courses:
   1. all required PHBS and PHPR courses through the P-3 year.
   2. required BIOL, CHEM, and MATH courses (or their equivalents)
   Failure to attain a “C” or better letter grade after the second repeat attempt (third time total) will result in the student’s dismissal (see “Academic Standing,” page 204) from the pharmacy program.
C. Beginning 6-1-97, all pharmacy students must have a cumulative GPA of 2.00 or higher and a letter grade of “C” or better in all required MATH, CHEM, BIOL and pharmacy courses prior to entering the P-4 year. Those students not meeting this requirement will maintain the class rank of P-3 and may not take any P-4 level coursework until all stated requirements are met.
8. Except where noted, credit hours earned in repeated courses can be counted only one time among the total hours required for graduation.
9. A student earning an “F” in any module may not progress beyond that quarter until that module is repeated with an earned grade of “C” or better. A student earning two “F”s will be dismissed from the College of Pharmacy.
10. A student earning a “D” in any module will be allowed to progress and not be required to repeat the module unless a concurrent or subsequent “D” or “F” is earned in another module. An exception to this rule is the Capstone Module (BSPC 546) wherein the student must earn a grade of “C” or better. Students who received a second “D” during
the first module of a quarter are permitted to take the subsequent module. These students are subject to regulation #11 of this section (follows).

11. A student earning a second “D” in any professional module may not progress and must repeat not only that course, but the course in which he/she received the other “D.” A student earning three “D”s or two “D”s and one “F” will be dismissed from the College of Pharmacy.

Academic Policies for the Non-Traditional Doctor of Pharmacy Degree Program

The standard University guidelines are applicable to all non-traditional students with the following additions.

1. A pharmacist will have a maximum of three years to complete the didactic courses and a maximum of five years to complete the program.

2. Pharmacists must maintain a cumulative grade point average (GPA) of 2.00. The GPA will be calculated only from courses taken while enrolled in the non-traditional Doctor of Pharmacy program.

3. Pharmacists must maintain a current valid pharmacist’s license, without disciplinary sanctions from any Board of Pharmacy, throughout the time enrolled in the program.

4. Non-traditional Doctor of Pharmacy courses may be taken only while enrolled in the non-traditional Doctor of Pharmacy program.

5. Credit earned while enrolled in the non-traditional Doctor of Pharmacy program cannot be transferred into the entry-level Doctor of Pharmacy program.

S/U Grade Option

Students may utilize the S/U grade option only as noted in the College of Pharmacy catalog course descriptions. Otherwise, students are not permitted to register for courses on an S/U basis if the course is offered on a graded basis.

Classification of Students

Students may be advanced to the following classifications upon meeting the stated requirements.

Beginning Fall 1999

P-2: a minimum of 54 (50 B.S. Pharm.) quarter hours of credit, completion of Chemistry 171, 172, and 173; Biology 121, 122 and 124; Math 154 and 156; The Profession of Pharmacy 101, 102, and 103.

P-3: a minimum of 108 (100 B.S. Pharm.) quarter hours of credit, completion of Organic Chemistry with laboratory; Physics 120; Biostatistics 256; The Profession of Pharmacy 201, 202 and 203.

P-4: a minimum of 162 (150 B.S. Pharm.) quarter hours of credit, completion of Biochemistry 341 and 342; Immunology 375; Microbiology 313; Physiology 331, 332 and 333; Bioscience Laboratory 322 and 323; The Profession of Pharmacy 301, 302 and 303. A cumulative GPA of 2.00 or higher and a letter grade of “C” or better in all required chemistry, biology, mathematics, physics and pharmacy courses.

P-5: a minimum of 216 (201 B.S.Pharm.) quarter hours of credit. A cumulative GPA of 2.00 or higher and have successfully completed Biomedical Science and Patient Care (BSPC) 441, 442; PHBS 432, 444; and PHPR 401, 402 modules.

P-6: a minimum of 270 quarter hours of credit. A cumulative GPA of 2.00 or higher and have successfully completed Biomedical Science and Patient Care (BSPC) 543, 544, 545; PHPR 550 modules and received a letter grade of “C” or better in BSPC 546.

Other information relative to the requirements for reclassification of standing may be obtained in the office of Pharmacy Student Services of the College of Pharmacy.

Academic Standing

A student who fails to maintain the prescribed standards of scholarship will be subject to one of the following actions, namely: 1) probation, 2) continued probation, 3) suspension from the college, or 4) dismissal from the college.

Following the first quarter that a student’s cumulative grade point average (GPA) falls below 2.00, the student will be placed on probation. If a student on probation fails to obtain good academic standing (cumulative GPA 2.00 or higher) after the following quarter, the student will be placed on continued probation. If good academic standing is not achieved by the end of the following quarter the student should expect to be suspended. Any student with a quarterly GPA of less than 1.00 may be placed on probation or suspended. When a student is on probation, the college may impose special conditions for continued enrollment. Students on probation cannot participate in competitive activities of individuals, teams, or other groups officially designated as representing the University.

When action is taken to suspend a student, the suspension will be for a specified period of time after which the student will be eligible to apply for readmission. Readmission is not automatic. If readmis-
sion is granted, the faculty will establish specific conditions of academic performance expected of the student. A quarterly GPA of less than 2.00 in any of the first three quarters after readmission may lead to dismissal. Dismissal is a terminal action and the student is not eligible to apply for re-admission to the College of Pharmacy at any time thereafter.

**Dual Degree Programs**

Information concerning undergraduate dual degree programs involving the College of Pharmacy appears on page 33 of this catalog. Students may receive further details in the Office of Pharmacy Student Services.

**Student Services**

The College of Pharmacy provides specialized services to students and alumni through the staff of the Office of Pharmacy Student Services, including college admissions, academic advising, personal counseling, career counseling, and job placement. The staff of the office also coordinates professional organization functions, student group activities, and serves as the focus for special project planning and implementation.

**Student Conduct**

Students enrolled in the College of Pharmacy are expected to uphold high professional standards. The abuse or possession of narcotics, stimulants, or hallucinogens without the supervision of his/her own physician is unacceptable conduct and can subject the student to dismissal. A student who has been convicted of a felony or who has violated any state or federal pharmacy or drug law can be dismissed from the college.

**Special Notice**

Because of rapid developments in the health professions, the curriculum and academic standards of the College of Pharmacy are constantly being reviewed by the faculty. The faculty of the college reserves the right, without advance notice, to change the content, duration and sequence of any course included in the curriculum, or to increase or decrease the number of credit hours leading to the degree. The faculty also reserves the right without advance notice to change the academic standards of the college.

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**Subject - Biomedical Science and Patient Care (BSPC)**

**441 - BIOMEDICAL SCIENCE AND PATIENT CARE MODULE 1: CARDIOVASCULAR SYSTEM**

9.00 Credits
Cardiovascular disease states and the therapeutic agents used in the diagnosis, treatment, and prevention of such diseases. Emphasis is placed on an understanding of the pharmacological rationale for the therapeutic treatment of cardiovascular disease. Individual agents are explained based on pharmacology and chemical properties and how these characteristics influence their therapeutic utility in the treatment of cardiovascular disease. Prerequisites: PHBS 432, PHBS 444 and PHPR 402.

**442 - BIOMEDICAL SCIENCE AND PATIENT CARE MODULE 2: INFECTIOUS DISEASE**

9.00 Credits
An interdisciplinary course focusing on antibiotics and other chemicals used in the prophylaxis and treatment of infectious diseases. Antibacterial agents, antifungal agents, antiviral agents and antiparasitic agents will be covered. Individual drugs are discussed in terms of basic chemistry, mechanism of action, structure-activity relationships, modes of resistance, microbial susceptibility, therapeutic applications, pharmacokinetic properties, drug interactions and adverse effects. In-depth analysis of the pathophysiology of disease and treatment related to infectious disease covered in a standard medically related systems approach. Students are required to compare findings of current literature to standard text material, focus on problem solving/decision making based on case examples, calculate a drug dose and make necessary adjustments for unique disease states or special patient circumstances and select an appropriate regimen of choice based on cost effectiveness and ethical consideration. Investigational modes of therapy will also be covered for selected infectious diseases. Prerequisites: PHBS 432, PHBS 444 and PHPR 402.

**543 - BIOMEDICAL SCIENCE AND PATIENT CARE MODULE 3: THE CENTRAL NERVOUS SYSTEM AND SPECIAL SENSES**

9.00 Credits
An integrated approach to disease states primarily affecting the central nervous system and special senses, and the therapeutic agents used in the diagnosis, treatment, and prevention of such diseases. Emphasis is placed on an understanding of the pathophysiology of the disorders and the pharmacological rationale for their treatment. Individual agents are explained based on pharmacodynamic, pharmacokinetic and chemical properties and how these characteristics influence the therapeutic utility of these
agents. Format includes case studies, student reports and traditional discussion sessions. Prerequisites: BSPC 441 and 442.

544 - BIOMEDICAL SCIENCE AND PATIENT CARE MODULE 4: THE ENDOCRINE AND MUSCULOSKELETAL SYSTEM
9.00 Credits
An integrated approach to endocrine and musculoskeletal disorders, including the rational use of pharmacological agents to treat them. Comprehensive discussion of drug design and structure activity relationships is integrated with the therapeutic and toxicologic actions of the drugs. Basic concepts and principles of the pharmacodynamic and pharmacokinetic properties of the drugs used in these disease states will be discussed as they pertain to the endocrine and musculoskeletal systems. Prerequisites: BSPC 441 and 442.

545 - BIOMEDICAL SCIENCE AND PATIENT CARE MODULE 5: ONCOLOGY AND GASTROINTESTINAL SYSTEM
9.00 Credits
The oncology and gastrointestinal components of this module are integrated approaches to the study of neoplastic and gastrointestinal diseases and the therapeutic agents used in the diagnosis, treatment, and prevention of such diseases. Emphasis is placed on an understanding of the pharmacological rationale for the therapeutic treatment of cancer and gastrointestinal disease. Individual diagnostic, therapeutic and preventive agents are characterized by their pharmacological and chemical properties and how these properties influence the therapeutic utility of these agents in the treatment of neoplastic and gastrointestinal diseases. Prerequisites: BSPC 543 and 544.

546 - BIOMEDICAL SCIENCE AND PATIENT CARE MODULE 6: CAPSTONE IN PHARMACY PRACTICE
9.00 Credits
The module requires the student to utilize accumulated pharmaceutical education and apply learned principles to organize and synthesize relevant information to describe, optimize and critique drug therapy in unique and classic diseases. Information will be presented in written and oral, formal and informal formats. Activities include case presentations, reviews of “the literature”, literature critiques and other formats that allow demonstration of proficiency in effective, safe, and “patient specific” application of drug therapy. Students work in small groups when possible to demonstrate interpersonal skills. Culminates with an encompassing final exam which is a prerequisite for clinical rotations. Prerequisites include admission to the Pharm.D. program and successful completion of BSPC 543, 544, 545 and PHPR 550 modules.

DEPARTMENT OF PHARMACEUTICAL & BIOMEDICAL SCIENCES

Professors Bhattacharya, Faulkner (Chair), Gossel, Milks, L. Smith; Associate Professors Christoff, Kinder, Knecht, Rao, E. Smith, Sprague

Subject - Pharmaceutical and Biomedical Sciences (PHBS)

First number in parentheses is lecture hours per week, second number is laboratory hours per week.

200 - SPIRITUALITY AND HEALTH
2.00 Credits
Implications of spiritual outlook and practice on patient compliance, coping skills and other aspects of health care. Prerequisite: Permission of instructor.

210 - PHARMACEUTICAL SCIENCE TECHNIQUES
2.00 Credits
Laboratory techniques employed in research in the pharmaceutical sciences. Preparation for graduate studies in any of the related sciences. Prerequisites: P-2 status and permission of the instructor.

302 - MEDICAL TERMINOLOGY (3+0)
3.00 Credits
Medical terminology specifically, and scientific terminology in general. Emphasis on root words and affixes which have general and frequent occurrence in the communication of medicine, pharmacy, biology, chemistry, and related areas.

310 - DRUG ABUSE EDUCATION (2+0)
2.00 Credits
Development of skills in educating community groups regarding drugs and drug abuse. Emphasis on the development, mastery and delivery of concept-oriented lectures, and the effective use of learning materials in providing drug abuse education to various community groups, especially middle school and high school students. Background information, presentation techniques and approaches, and various current topics relating to substance abuse are presented and discussed. Corequisite: BIOL 124.
311 - SPECIAL TOPICS IN DRUG ABUSE EDUCATION (1+0)
1.00 Credit
Community service-oriented presentation of drug abuse education talks to various community groups, including middle school and high school students. Opportunity to further develop skills in conveying health information to the public, focusing on issues relating to drug abuse and chemical dependency. Can be repeated indefinitely. Corequisite: PHBS 310.

330 - ALTERNATIVE HEALTH CARE
3.00 Credits
Selected principles and practices of alternative (complementary) health care, including homeopathy, herbs, energy and touch therapies. Emphasis on implications for pharmacists. Prerequisite: Permission of the instructor.

341 - BIOCHEMISTRY 1 (4+0)
4.00 Credits
The chemistry of living organisms with emphasis on the human system. Topics include acid-base balance, buffers, chemistry of amino acids, proteins, enzymes, carbohydrates, lipids, vitamins, nucleic acids and porphyrins. Prerequisites: A "C" of better in CHEM 251, CHEM 252 and CHEM 253.

342 - BIOCHEMISTRY 2 (4+0)
4.00 Credits
The major metabolic processes that are essential for human life, including biochemical energetics, the electron transport system, Kreb's cycle, the metabolism of carbohydrates, lipids and amino acids, and the biosynthesis of purines, pyrimidines, nucleic acids and proteins. Biochemical genetics and genetic disorders are also covered. Prerequisite: PHBS 341.

350 - BASIC NUTRITION (3+0)
3.00 Credits
Basic principles of nutrition for pharmacy and nonpharmacy students. Topics include a description of essential nutrients, methods of evaluating individual dietary adequacy, and dietary methods for weight control.

351 - DIAGNOSTIC TESTS (3+0)
3.00 Credits
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: PHBS 342 or permission of instructor.

370 - SEMINAR IN BIOMEDICAL AND PHARMACEUTICAL SCIENCES
1.00 Credit
Student-presented seminars which review research topics of interest in pharmaceutical and biomedical sciences or which review specific papers in the scientific literature. Preparation for graduate study in the pharmaceutical and biomedical sciences. Prerequisite: Permission of the instructor.

375 - IMMUNOLOGY (3+0)
4.00 Credits
Modern immunology and immunotherapy. The principles of basic and clinical immunology, historical background, host defense mechanisms, types of immune responses, nature of antigens and antibodies, antigen-antibody interactions leading to immunological disease, and transplantation and cancer immunology. The use of immunobiologics currently available in the USA for prevention and treatment of most common infections and immunologic diseases. The role of biotechnology as a source of immunobiologics will be discussed. Prerequisite: BIOL 331 and PHBS 341. Corequisite: BIOL 332.

381 - NATURAL PRODUCTS 1 (4+0)
4.00 Credits
Medicinal constituents found in terrestrial and marine plant origin. Brief history and sources of selected major plant constituents, the chemical, biological properties and category of uses are presented. Prerequisites: One year of biology and one year of organic chemistry.

382 - NATURAL PRODUCTS 2 (2+0)
2.00 Credits
A continuation of Natural Products I dealing specifically with natural products found in both terrestrial and marine animals. Emphasis is on biomedicinals such as hormones and enzymes, and on the biotoxins elaborated from these animals. Prerequisite: PHBS 381.

431 - PHARMACEUTICAL SCIENCES MODULE 1
8.00 Credits
The physical pharmacy, pharmaceutical and biopharmaceutical aspects of a variety of drug delivery systems, predominantly peroral solution and solid dosage forms. The time-course of drug substances in various body compartments (pharmacokinetics) will be treated in a quantitative manner, and delivery system formulation factors which may affect drug pharmacokinetics (biopharmaceutics) will be discussed. Laboratory exercises introduce the basic pharmaceutical concepts and techniques necessary to prepare
extemporaneous dosage forms, including solution, capsules, lotions and suspensions. The chemical, physical and biological properties of the ingredients used and their relationship to the final product will be discussed in order to facilitate preparation of elegant, stable, safe and effective products. Prerequisite: P-4 standing.

432 - PHARMACEUTICAL SCIENCES MODULE 2
8.00 Credits
A continuation of Pharmaceutical Sciences 1. The pharmaceutical, biopharmaceutical and pharmacokinetic aspects of a variety of drug delivery systems, predominantly suspensions, emulsions, aerosols, semisolids, transdermal, and controlled release dosage forms. Novel and experimental drug delivery systems also will be examined. The bioavailability and bio- and generic equivalence of peroral products. The basic principles, equipment and techniques involved in the preparation and administration of parenteral sterile dosage forms will be discussed. Laboratory exercises introduce the basic pharmaceutical concepts and techniques necessary to prepare extemporaneous dosage forms, including ointments, suppositories, and parenteral sterile dosage forms. The chemical, physical and biological properties of the ingredients used and their relationship to the final product will be discussed in order to facilitate preparation of elegant, stable, safe and effective products. Prerequisites: P-4 standing, PHBS 431, PHBS 443 and PHPR 401.

441 - MEDICINAL PLANT PROPAGATION AND CULTIVATION (2+3)
3.00 Credits
The economic, geographic, 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. Required research of literature, writing and presentation of reports. Prerequisite: Permission of instructor.

443 - BIOMEDICAL SCIENCES MODULE 1
8.00 Credits
An interdisciplinary focus on the mechanisms by which diseases, drugs and chemicals alter normal biochemical and physiological processes. The sciences of pathophysiology, pharmacology, toxicology, and medicinal chemistry are integrated to provide an in-depth understanding of these mechanisms. The course progresses from factors affecting sub-cellular mechanisms to those of whole organ systems. Includes small group recitation and student-presented seminar sections in order to introduce the basic and clinical scientific literature and provide activities which illustrate the pharmacotherapeutic applications of the material. Prerequisite: P-4 status.

444 - BIOMEDICAL SCIENCES MODULE 2
8.00 Credits
Continuation of PBS 443. Prerequisites: PHBS 431 and 443, and PHPR 401.

502 - PRINCIPLES AND PRACTICE OF PUBLIC HEALTH (3+0)
3.00 Credits
Individual and community aspects of public hygiene, including infections, epidemiology, prophylaxis, and discussion of major illnesses (nutritional, mental, environmental and occupational).

511 - VETERINARY PHARMACY (2+0)
2.00 Credits
The various pathological conditions peculiar to animals and the pharmaceuticals used in the treatment thereof. Prerequisite: Permission of instructor.

530 - MANUFACTURING PHARMACY (1+6)
3.00 Credits
The formulation and fabrication by mechanized methods of a variety of pharmaceutical dosage forms. Graded S/U. Prerequisite: Permission of the instructor.

545 - DRUGS OF ABUSE (2+0)
2.00 Credits
Major issues regarding drug abuse, with special emphasis on the specific agents of abuse, their sources, common distribution modes, patterns of substance abuse, pharmacological effects and mechanisms, toxicologic concerns, treatment modalities and approaches to drug abuse education. Prerequisite: Permission of the instructor.

546 - INTRODUCTION TO GERIATRIC PHARMACOLOGY (2+0)
2.00 Credits
Principles dealing with age-related physical and mental changes; pharmacokinetics, drug interactions, disease states and drug therapy, misuse and abuse of medication in the elderly. Prerequisite: Permission of instructor.

562 - SURVEY OF RESEARCH AREAS IN THE PHARMACEUTICAL SCIENCES 1 (1+0)
1.00 Credit
The research areas in the pharmaceutical, biomedical and pharmacy administration areas, and opportunities in these areas are defined. Team taught by pharmacy faculty and designed for Pharmacy and Arts and Sciences. Students interested in research careers. Graded S/U. Prerequisites: P-2 or sophomore standing.
563 - SURVEY OF RESEARCH AREAS IN THE PHARMACEUTICAL SCIENCES 2 (1+0)
1.00 Credit
Continuation of PHBS 562 with emphasis on the particular research interests of the faculty and presentations by outside speakers from academia, government, and industry. Graded S/U. Prerequisites: P-2 or sophomore standing.

564 - SURVEY OF RESEARCH AREAS IN THE PHARMACEUTICAL SCIENCES 3 (1+0)
1.00 Credit
Continuation of PHBS 563 with emphasis on the particular research interests of the faculty and presentations by outside speakers from academia, government and industry. Graded S/U. Prerequisite: P-2 or sophomore standing.

565 - RESEARCH IN THE PHARMACEUTICAL AND BIOMEDICAL SCIENCES (0+2)
2.00 Credits
For students who intend to pursue graduate study in pharmacology, toxicology or related biomedical areas. Participation in all aspects of the design, implementation, model preparation, instrumentation, and reporting of specific research problems. Can be repeated for a maximum of 12 hours.

571 - SEMINAR IN PSYCHOPHARMACOLOGY (2+0)
2.00 Credits
Presentations of papers and discussions of topics of interest. Current papers in mental illness. Psychedelic drug effects and pharmacological research are discussed. Prerequisite: Permission of the instructor.

572 - SEMINAR IN TOXICOLOGY (2+0)
2.00 Credits
Presentation of papers and discussion of topics. Current events and relevant topics in clinical, occupational industrial, and environmental toxicology are discussed. Prerequisite: Permission of the instructor.

573 - SEMINAR IN PEDIATRIC PHARMACOLOGY (2+0)
2.00 Credits
Common pediatric medical disorders and their management with special reference to the pharmacologic basis of pediatric medicine. Prerequisite: Permission of instructor.

575 - SEMINAR IN PROBLEMS OF DRUG ABUSE (2+0)
2.00 Credits
Adverse effects of illicit drugs, particularly the long-term consequences of drug abuse. The problems of drug abuse from pharmacologic and biomedical aspects are discussed. This course may be repeated an indefinite number of times. Prerequisite: Permission of the instructor.

590 - SPECIAL TOPICS IN PHARMACEUTICAL AND BIOMEDICAL SCIENCES
1.00 to 3.00 Credits
Can be repeated as the subject varies. Prerequisite: Permission of the instructor.

594 - SEMINAR IN PHARMACEUTICAL AND BIOMEDICAL SCIENCES
1.00 to 3.00 Credits
Can be repeated as the subject varies. Prerequisite: Permission of the instructor.

597 - INDEPENDENT STUDY-PHARMACEUTICAL AND BIOMEDICAL SCIENCES
1.00 to 3.00 Credits
Can be repeated as the subject varies. Prerequisite: Permission of department chairman and accumulative grade point average of 2.50.

DEPARTMENT OF PHARMACY PRACTICE

Professors K. Kier, Previte, L. Savino; Associate Professors Allison, Broedel-Zaugg, Jones, Lucas (part-time), Reiselman, Shoemaker; Assistant Professors Kisor, Parteleno, Stanovich (Chair), Sullivan, J. Turner; Clinical Professor Blumer (shared); Associate Clinical Professors Cubick (shared), Gibbs (shared), Hullis (shared), Reed (shared); Assistant Clinical Professors Ballentine (shared), Brown (shared), Halula (shared), Krinsky (shared), Laughlin (shared), Letting (shared), O’Connell (shared), P. Smith (shared), Sutherland (shared), Sweeney (shared), Waller (shared); Instructor T. Kier; Assistant Instructor M. Turner

Subject - Pharmacy Practice (PHPR)

101 - THE PROFESSION OF PHARMACY 1
1.00 Credit
The profession of pharmacy, the delivery of patient care, and the operation of the University and College of Pharmacy. Traditional classroom presentations reinforced through structured experiential rotations in a variety of health care and community service sites.

102 - THE PROFESSION OF PHARMACY 2
1.00 Credit
Continuation of PHPR 101. Prerequisite: PHPR 101.

103 - THE PROFESSION OF PHARMACY 3
1.00 Credit
Continuation of PHPR 102. Prerequisite: PHPR 102.
201 - THE PROFESSION OF PHARMACY 4
2.00 Credits
Continuation of professional development and understanding of pharmacy services and patient care delivery. Addresses issues relevant to the preparation for pharmacy internship and advanced pharmacy course work. Prerequisite: PHPR 103.

202 - THE PROFESSION OF PHARMACY 5
2.00 Credits
Continuation of PHPR 201. Prerequisite: PHPR 201.

203 - THE PROFESSION OF PHARMACY 6
2.00 Credits
Continuation of PHPR 202. Prerequisite: PHPR 202.

230 - ETHICS IN PROFESSIONAL PRACTICE (2+0)
2.00 Credits
Guided discussions show that there are ethical problems in life and that there are better and worse ways of dealing with those problems.

241 - CONTEMPORARY PHARMACY PRACTICE
2.00 Credits
Multiple practice settings including retail, institutional, manufacturing, distribution, association, government and how each is implementing a pharmaceutical care mission. May be repeated for up to 6 credit hours.

301 - THE PROFESSION OF PHARMACY 7
2.00 Credits
Continued professional development, understanding, and reinforcement of pharmacy services and patient care delivery. The functional practice of pharmacy, including product (medication and information) distribution systems and evaluation of their quality and impact on professional, legal, patient care. Prerequisite: PHPR 203.

302 - THE PROFESSION OF PHARMACY 8
2.00 Credits
Continuation of PHPR 301. Prerequisite: PHPR 301.

303 - THE PROFESSION OF PHARMACY 9
2.00 Credits
Sixty documented experiential contact-hours providing skills development in pharmaceutical patient care. Credit given upon successful completion of a comprehensive final examination. Prerequisite: PHPR 302 and a valid pharmacy internship license.

331 - INTRODUCTION TO OTC PRODUCTS
3.00 Credits
Development of appropriate counseling and guidance to patients who desire to conduct self-medication or self-therapy with non-prescription drug products/devices. Prerequisite: PHPR 302.

401 - PATIENT CARE ASSESSMENT MODULE 1
2.00 Credits
Preparation for subsequent therapeutic oriented modules. Development and enhancement of analytical and communicative skills required to prepare a drug therapy problem list. Prerequisite: PHPR 303.

402 - PATIENT CARE ASSESSMENT MODULE 2
2.00 Credits
Various aspects of physical assessment as they pertain to the delivery of "pharmaceutical care". Prerequisite: PHPR 401.

478 - OUTPATIENT PHARMACY SERVICE (0+3)
1.00 Credit
A laboratory to serve the needs of the Health Center through the operation of the Student Health Pharmacy. Specific components include: the dispensing of prescriptions, patient counseling and patient profile maintenance. For students with limited or no internship experience. Prerequisites: Valid Ohio intern license. May be repeated for up to four credit hours.

550 - PHARMACY ADMINISTRATION MODULE
9.00 Credits
An interdisciplinary approach to the practice of pharmacy as it fits into the contemporary healthcare system and the business environment. Includes theoretical concepts as well as practical methodology techniques to assess the external and internal economic, social, philosophical, ethical, and legal influences on the practice. Planning, evaluating, and decision making through financial report analysis and case study is stressed. Prerequisites: BSPC 543 and 544.

570 - BACHELOR OF SCIENCE/PHARMACY EXPERIENTIAL MODULE
18.00 Credits
Multi-dimensional experiences in hospital and community-based contemporary pharmacy practice. Students will apply principles learned during the didactic curriculum within actual patient care/dispensing environments. All experiences are off-campus. Required transportation and housing to be arranged by the student. Prerequisites: P-5 standing, valid Ohio Intern License and updated immunizations, as required by teaching site and/or state and federal regulatory agencies. Students must have successfully completed BSPC 543, 544 and 545 and PHPR 550 modules.
590 - SPECIAL TOPICS IN PHARMACY PRACTICE
1.00 to 16.00 Credits
Can be repeated as the topic varies. Prerequisite: Permission of the instructor.

594 - SEMINAR IN PHARMACY PRACTICE
1.00 to 3.00 Credits Can be repeated as the topic varies. Prerequisite: Permission of the instructor.

597 - INDEPENDENT STUDY-PHARMACY PRACTICE
1.00 to 16.00 Credits Can be repeated as the topic varies. Prerequisites: Permission of department chair and 2.50 accumulative grade point average.

650 - CLERKSHIP IN PHARMACY PRACTICE
(0+40) 6.00 Credits
Full-time experiential program emphasizing delivery of as well as a means of integrating facts and principles of pharmaceutical care in primary, secondary and tertiary patient care settings. Process will occur in both institutional and ambulatory settings. Will serve as practice in providing pharmaceutical care as well as a means of integrating facts and principles received from antecedent courses. At each practice setting, the student is expected to become a functioning component of the ongoing pharmaceutical care services through faculty instruction, self-learning, and by observing the modeling of attendant faculty members. Prerequisites: BSPC 543, 544, 545, 546, and PHPR 550. Students must register for the course nine times for a total of 54 credits. Sections include but are not limited to: 01-General Medicine; 02-Ambulatory Care; 03-Intensive Care; 04-Geriatrics; 05-Community Pharmacy; 06-Hospital Pharmacy; 07-Institutional Administration; 08-Nutrition; 09-Home Health Care; 10-Drug Information; 11-Infectious Disease; 12-Cardiology; 13-Surgical Care; 14-Pediatrics; 15-Pharmacokinetic Services; 16-Psychiatry; 17-Gastroenterology; 18-Oncology; 19-Pulmonary Medicine; 20-Research; 21-Education; 22-Emergency Medicine; 23-Long Term Care; 24-Managed Care; 25-Pharmaceutical Industry; 26-Organ Transplant Medicine; 27-Internal Medicine; 28-Preventive Medicine; 29-Neurology; 30-AIDS Education; 31-OB/GYN; 32-Poison Control; 33-Ambulatory Care-Public Health Service; 34-Pharmaceutical Science; 35-Nephrology; 36-Community Administration; 37-Burn Therapy; 38-Family Medicine-CORE; 39-Veterinary Medicine; 40-Pain Management.

701 - ORIENTATION TO DOCTOR OF PHARMACY (NON-TRADITIONAL)
.00 Credits
Orientation to the non-traditional Doctor of Pharmacy program and completion of a prior learning assessment (PLA) portfolio (documentation of the pharmacist’s experience and accomplishments). The portfolio is a requirement for continuation in the program. Prerequisite: Admission to the non-traditional Doctor of Pharmacy program.

710 – BIOSTATISTICS
3.00 Credits
Basic statistical procedures and more advanced statistical methods used in the pharmaceutical and medical sciences. Application of statistical methods in the development of research design and evaluation of clinical studies. Prerequisite: PHPR 701.

715 - SPECIAL TOPICS IN PHARMACY PRACTICE
1.00 to 3.00 Credits
Internet based course clinically or disease oriented. Can be repeated as the topic varies. Prerequisites: PHPR 701, 710, 720 and 730. DOES NOT COUNT TOWARD GRADUATION.

720 - DRUG LITERATURE EVALUATION
3.00 Credits
Drug information sources (including the primary scientific literature). Processes used to make authoritative judgements based on information provided from principles of research methodology. Application of epidemiologic methods to the characteristics and events of drug use. Prerequisite: PHPR 710.

725 - INDEPENDENT STUDY IN PHARMACY PRACTICE
3.00 Credits
Internet based course for independent research efforts. Can be repeated as the topic varies. Prerequisite: PHPR 701. DOES NOT COUNT TOWARD GRADUATION.

730 – PHARMACOKINETICS
3.00 Credits
Use of mathematical and computer modeling to explore the derivation of principles. Specific pharmacokinetic parameters of a group of drugs is discussed by investigating pharmacokinetic research literature. Application of concepts to dosing patients is emphasized and specific case studies are included. Prerequisite: PHPR 701.
740 - PHYSICAL ASSESSMENT
3.00 Credits
Preparation for clerkship in pharmacy practice. Experiences in various aspects of physical assessment. Prerequisite: PHPR 701.

750 - PATHOPHYSIOLOGY AND THERAPEUTICS: CARDIOLOGY
3.00 Credits
Physiology and pathophysiology of the cardiovascular disease process covered in a standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text material; focus on problem solving/decision making based on case examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PHPR 720 and 730.

755 - PATHOPHYSIOLOGY AND THERAPEUTICS: RENAL
3.00 Credits
Physiology and pathophysiology of the renal disease process covered in standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text material; focus on problem solving/decision making based on case examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PHPR 720 and 730.

760 - PATHOPHYSIOLOGY AND THERAPEUTICS: INFECTIOUS DISEASE
3.00 Credits
Physiology and pathophysiology of the infectious disease process in a standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text material; focus on problem solving/decision making based on case examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PHPR 720 and 730.

765 - PATHOPHYSIOLOGY AND THERAPEUTICS: CENTRAL NERVOUS SYSTEM/ PSYCHIATRIC DISEASES
3.00 Credits
Physiology and pathophysiology of the central nervous system and psychiatric disease process covered in a standard medically related systems approach and in depth treatment of available therapeutics modalities. Findings of current literature and comparison to standard test material; focus on problem solving/decision making based on case examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PHPR 720 and 730.

770 - PATHOPHYSIOLOGY AND THERAPEUTICS: RESPIRATORY
3.00 Credits
Physiology and pathophysiology of the respiratory process covered in a standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text material; focus on problem solving/decision making based on case examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PHPR 720 and 730.

775 - PATHOPHYSIOLOGY AND THERAPEUTICS: ENDOCRINE
3.00 Credits
Physiology and pathophysiology of the endocrine system disease process covered in a standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text material; focus on problem solving/decision making based on case examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PHPR 720 and 730.

780 - PATHOPHYSIOLOGY AND THERAPEUTICS: GI TRACT/NUTRITION
3.00 Credits
Physiology and pathophysiology of the gastrointestinal tract disease process and nutritional support covered in a standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text material; focus on problem solving/decision making based on case examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PHPR 720 and 730.

785 - PATHOPHYSIOLOGY AND THERAPEUTICS: ONCOLOGY
3.00 Credits
Physiology and pathophysiology of the cancer disease process covered in a standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text material; focus on problem solving/decision making based on case examples; drug dosing; treatment of choice and investigational modes of therapy. Prerequisites: PHPR 720 and 730.
790 - PATHOPHYSIOLOGY AND THERAPEUTICS: DERMATOLOGY/OPHTHALMIC
3.00 Credits
Physiology and pathophysiology of disease processes, including dermatology, soft tissue, and ophthalmic, covered in standard medically related systems approach and in depth treatment of available therapeutic modalities. Findings of current literature and comparison to standard text examples; drug dosing; treatments of choice and investigational modes of therapy. Prerequisites: PHPR 720 and 730.

800 - CLERKSHIP IN PHARMACY PRACTICE
5.00 to 6.00 Credits
Experiential program emphasizing delivery of pharmaceutical care in primary, secondary and tertiary care settings. At each practice setting, the pharmacist is expected to become a functioning component of the ongoing pharmaceutical care services through faculty instruction and self-learning. Sections include but are not limited to: 01-General Medicine; 02-Ambulatory Care; 03-Intensive Care; 04-Geriatrics; 07-Institutional Administration; 08-Nutrition; 09-Home Health Care; 10-Drug Information; 11-Infectious Disease; 12-Cardiology; 13-Surgical Care; 14-Pediatrics; 15-Pharmacokinetic Services; 16-Psychiatry; 17-Gastroenterology; 18-Oncology; 19-Pulmonary Medicine; 20-Research; 21-Education; 22-Emergency Medicine; 23-Long Term Care; 24-Managed Care; 25-Pharmaceutical Industry; 26-Organ Transplant Medicine; 27-Internal Medicine; 28-Preventive Medicine; 29-Neurology; 30-AIDS Education; 31-OB/GYN; 32-Poison Control; 33-Ambulatory Care-Public Health Service; 34-Pharmaceutical Sciences; 35-Nephrology; 36-Community Administration; 37-Burn Therapy; 38-Family Medicine-CORE; 39-Veterinary Medicine; 40-Pain Management.