The Getty College of Arts and Sciences

Byron L. Hawbecker, Interim Dean

Accredited by
The American Chemical Society
The National Association of Schools of Music
The Department of Education of the State of Ohio

Membership in
American Association of Colleges for Teacher Education
American Association for Higher Education
American Historical Association
American Institute of Biological Sciences
American Political Science Association
American Theatre Association
Association for Computing Machinery
College Art Association
Mathematical Association of America
Modern Language Association of America
National Association of Industrial Technology
National Association for Sports & Physical Education
Ohio Association of Colleges for Teacher Education
Public Relations Society of America
Speech Communication Association

Departments
Art; Biological Sciences; Chemistry; Communication Arts; Education; English; Foreign Languages; Health, Physical Education, and Sports Studies; History and Political Science; Industrial Technology; Mathematics and Computer Science; Music; Philosophy and Religion; Physics; Psychology and Sociology.

Endowed Chairs

The Eleanor H. and Robert W. Biggs Chair in Sciences was established in 1992. The 1992-93 recipient is Dr. Eric Nelson.

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 1992-93 recipient is Dr. Ellen Wilson.

The Northern Chair in Education and Professional and Social Sciences, an unfunded chair, was established in 1992. The 1992-93 recipient is Dr. David Devier.

The Mary Reichelderfer Chair for Mathematics and Computer Science was established in 1983 with funds from the estate of Mary K. Werkman. Dr. Tena Roepke is the 1992-93 recipient.

The Sara A. Ridenour Chair of Humanities was established in 1983 from funds provided by her daughter. The recipient for 1992-93 is Dr. Mark Lenssen.

The Kernan Robson Chair of Government, inaugurated in 1972, has been made possible by a trust established by the late Kernan Robson. The 1992-93 recipient is Dr. JoAnn Scott.

Mission Statement

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

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

**Admission Standards**

Candidates seeking admission to the College of Arts and Sciences are required to meet the general requirements for admission to the University. The College of Arts and Sciences accepts high school graduates and non-graduates who have 16 acceptable units. 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.

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

**Degree Requirements**

**Bachelor of Arts**

*Basic Requirements*
- Orientation or Freshman Seminar
- English 110 and 111
- Speech 100
- English 204 plus one additional course in literature from English or foreign languages
- Western Civilization 110 and 111
- Economics 100
- Philosophy 100 or 102
- Religion: one course from 105, 107, 108, or 110
- Foreign language: first-year competency (three courses in one modern spoken language)

*Distributional Requirements*
- **Fine Arts**
  - three courses (or equivalent totaling nine credit hours) in at least two disciplines: art, music, theatre. Six hours of a single, continuing activity course will equate to a three hour graduation requirement. A maximum of six additional activity hours, chosen from the following list, will count to meet General Education fine arts requirements:
    - 152-080 Chorus
    - 152-081 Chapel Choir
    - 152-082 Added Attraction
    - 152-083 University Singers
    - 152-084 Wind Ensemble
    - 152-085 Chamber Chorale
    - 152-086 Pep Band
    - 152-087 Symphonic Band
    - 152-088 Jazz Ensemble
    - 152-089 Opera Workshop
    - 152-090 Marching Band
    - 152-092 Woodwind Ensemble
    - 152-094 Brass Ensemble
    - 152-095 Percussion Ensemble
    - 152-096 Orchestra
    - 152-098 String Ensemble
    - 152-099 New Music Ensemble
    - 153-261 Performance Practicum
    - 153-276 Production Practicum
    - 153-378 Design Practicum
    - 153-387 Directing Practicum
- **Humanities**
  - one course not in discipline of primary major: literature or creative writing, foreign language, philosophy, religion.
- **Social Sciences**
  - two courses not in discipline of primary major: psychology, sociology, political science
- **Natural Sciences/Mathematics-Computer Science**
  - five courses in at least three departments: biology, chemistry, physics, mathematics-computer science. Students seeking teacher certification must take at least one computer science and one mathematics course.

**Graduation Requirements**

A student’s total education program must include the following:
- **use of the computer or substantial exposure to study of the uses and implications of computer technology as determined by the specific program major.**
- **at least one course which involves substantial exposure to or study of a non-Western or Third-World people, society, or culture**
- **at least three 1-hour physical education activity courses with 6 hours maximum counted toward the degree, except for physical education majors.**
- **completion of all major requirements as stipulated by the appropriate program faculty.**

**44 ARTS AND SCIENCES**
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, chemistry, physics, mathematics, computer science, industrial technology, or health, physical education and sports studies. Specific requirements for the B.S. in Medical Technology are listed under the department of biological sciences.

Basic Requirements
Orientation or Freshman Seminar
English 110 and 111
Speech 100
Philosophy 100 or 102
Religion: one course from 105, 107, 108, 109, or 110
English 204
Western Civilization 110 and 111
two courses in mathematics at the level of Functions I (120) or above and two additional courses in mathematics or computer science (computer science 130 or above) with at least one course in computer science

Distributional Requirements (outside the major program of study)
Science component (five courses)—at least two courses in biological sciences and two courses in chemistry or physics with one year's work in one of these disciplines
one course in social sciences
one course in fine arts - A total of 6 approved activity hours will meet this requirement. (See list under B.A. degree.)
three courses chosen from any combination of the following disciplines: art, music, theatre, English, literature or creative writing, foreign languages, philosophy, religion, history, political science, psychology, sociology, economics

Graduation Requirements
A student's total education program must include the following:

a. at least one course which involves substantial exposure to the study of a non-Western, Third-World people, society, or culture
b. at least three 1-hour physical education activity courses.
c. completion of all major requirements as stipulated by the appropriate program faculty.

Graduation Requirements:
Non-Western, Third World Culture Courses (B.A. and B.S. Degree)

The following courses will meet the general education graduation requirement in
Non-Western, Third-World culture study:
100-201 Introduction to the Third World (taken two times)
152-490 Non-Western Music
112-370 African Fiction
132-222 Contemporary Asia
132-223 Contemporary Africa
132-224 Contemporary Middle East
132-225 Contemporary Latin America
132-226 Human Geography
132-336 Developing Political Systems
132-471 History of the Ottoman Empire
113-329 Civilisation Francaise: Les Cultures Francophones
113-418 Francophone Literature of the Twentieth Century
113-351 Hispanic Cultural Perspectives
113-354 Civilizacion Hispanica II
113-355 Civilizacion Hispanica III
113-357 Latin American Art, Music, and Dance
132-324 Russian History I
133-250 Cultural Anthropology
115-291 Islam
115-291 Buddhism

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 at least one course from the fitness area and at least one course from the life skills area. Wellness laboratory is recommended for the third course. See the department of health, physical education and sports 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 45 quarter hours. Students may be listed as majoring in general studies during their freshman or sophomore years, but they must select a distinct major by the start of their junior year of study. A faculty advisor assists the student in planning a major by the third quarter of the 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 and Certification 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>
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<tbody>
<tr>
<td>Art</td>
<td>BA, BFA</td>
</tr>
<tr>
<td>Ceramics</td>
<td>BFA</td>
</tr>
<tr>
<td>Graphic Design</td>
<td>BFA</td>
</tr>
<tr>
<td>Painting</td>
<td>BFA</td>
</tr>
<tr>
<td>Printmaking</td>
<td>BFA</td>
</tr>
<tr>
<td>Sculpture</td>
<td>BFA</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</td>
<td>BA</td>
</tr>
<tr>
<td>Musical Theatre</td>
<td>BA</td>
</tr>
<tr>
<td>Public Relations</td>
<td>BA</td>
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<tr>
<td>Speech Communication</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>Elementary Education</td>
<td>BA</td>
</tr>
<tr>
<td>English</td>
<td>BA</td>
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<tr>
<td>English/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 &amp; Physical Education</td>
<td>BA, BS</td>
</tr>
<tr>
<td>Health Education</td>
<td>BA, BS</td>
</tr>
<tr>
<td>History</td>
<td>BA</td>
</tr>
<tr>
<td>Industrial Technology</td>
<td>BA, BS</td>
</tr>
<tr>
<td>International Studies</td>
<td>BA</td>
</tr>
<tr>
<td>Mathematics</td>
<td>BA, BS</td>
</tr>
<tr>
<td>Medical Technology</td>
<td>BSMT</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>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>Sociology</td>
<td>BA</td>
</tr>
<tr>
<td>Spanish</td>
<td>BA</td>
</tr>
<tr>
<td>Sports Management</td>
<td>BA, BS</td>
</tr>
<tr>
<td>Sports Medicine</td>
<td>BA, BS</td>
</tr>
<tr>
<td>Writing</td>
<td>(second major only) BA</td>
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</tbody>
</table>

Minors A formal program of academic minors is available in several of the subject matter areas. Consult the chairman of the department in question for specific procedural instructions. Minors require a minimum of 30 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.

The Bachelor of Music, Bachelor of Fine Arts, Bachelor of Science in Medical Technology Degree Programs

A candidate for the Bachelor of Music degree may major in music composition, education or performance. A candidate for the Bachelor of Fine Arts degree may concentrate in painting, printmaking, sculpture, ceramics or graphic design. A candidate for the Bachelor of Science in Medical Technology degree must complete the clinical year as well as other prescribed requirements. All teacher certification students seeking the Bachelor of Music degree or the Bachelor of Fine Arts degree must take at least one three hour computer science course and one three hour mathematics course.
Teacher Certification

Ohio Northern University is vitally concerned with preparing effective and efficient teachers. Certification 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 2.5 with no grade less than "C." The Center for Teacher Education and Certification establishes policies for admission into the program of teacher education and considers all applications for admission to the program.

Students preparing to teach are assigned advisors in the Center for Teacher Education and Certification 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 with degrees from other accredited universities may qualify for teacher certification by completing the required professional education courses in the Center for Teacher Education and Certification. The Center permits the completion of degree requirements and/or recommendation for teacher certification only when a student demonstrates qualities indicative of competence in teaching.

Preprofessional Programs

Medical Sciences Programs A Medical Sciences Advisory Committee with representatives from biology, chemistry, mathematics, physics, pharmacology, and a representative from outside the Division of Mathematics and Natural Sciences advises students in the areas of the medical sciences (premedicne, predentistry, preveterinary, 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 orientation and regularly during their under-graduate careers. The committee provides a guideline and a timetable to help a student pursue his/her career goals. The first year program usually includes biology, chemistry, English, and mathematics. After the first year, with the exceptions of organic chemistry and physics, the program is a function of the student's choice of departmental major and the professional schools to which he/she plans to apply. For further information, contact Dr. Howard L. Haight, chair, Medical Sciences Advisory Committee.

Medical Technology Most students in medical technology study three years on campus and spend a fourth clinical year at an accredited medical technology school. Forty-five quarter hours are transferred from the medical technology school to Ohio Northern University and applied toward a B.S. in Medical Technology degree. Ohio Northern University is affiliated with Riverside Hospital in Toledo.

For additional information see department of biological sciences program descriptions in this catalog. For detailed curriculum information contact the medical technology advisor, department of biological sciences.

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

A faculty member in the department of philosophy and religion serves as advisor to the pretheological student in planning a preprofessional program, along with a departmental advisor in the major, if the student elects a major outside the department of philosophy and religion.

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 32.

General Regulations

1. A student 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 freshman 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, 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 I 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.

S/U Grade Option

Students in the College of Arts and Sciences are given the opportunity to register for one course per quarter on an S/U (Satisfactory/Unsatisfactory) option basis, with the following stipulations:
1. The student must have sophomore, junior, senior or postgraduate 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 Probation

A grade point average of 2.00 is required for graduation. If a student's accumulative grade point average falls below 2.00 within a given quarter, that student is placed on probation, and participating in extracurricular activities is reviewed by the dean of the college.

If a freshman's accumulative grade point average falls below 1.60 within a given quarter, that student cannot participate in extracurricular activities unless approval is granted by the dean of the college. A student at sophomore standing must attain at least a 1.80 average to participate in extracurricular activities unless approval is granted by the dean. Upper-division students at junior and senior standing are expected to maintain grades above probationary status (2.0) to participate in extracurricular activities.

Any student on probation whose work for the following quarter continues 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 suspension or dismissal.

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 or composition, 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 certification.
121 - CAREER PLANNING
1.00 Credit(s)
Principles, methods, and practice in career planning with emphasis on self analysis, career information, exploration of careers, and career opportunities. The course is designed for freshmen or sophomores who are uncertain about their college major or their career plans.

190 - SPECIAL TOPICS
1.00 to 3.00 Credit(s)

201 - INTRODUCTION TO THE THIRD WORLD
2.00 Credit(s)
A series of films, speakers, panels, readings, and discussions centered around a country, area, or theme related to the Third World. This course must be taken twice to meet the general education requirement in non-Western culture.

290 - SPECIAL TOPICS
1.00 to 3.00 Credit(s)

390 - SPECIAL TOPICS
1.00 to 3.00 Credit(s)

490 - SPECIAL TOPICS
1.00 to 3.00 Credit(s)

DEPARTMENT OF AIR FORCE ROTC

(Department 102)

Subject - Air Force ROTC (ARFC)

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
1.00 Credit(s)
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.

100 - FRESHMAN SEMINAR
1.00 Credit(s)
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.
112 - AIR FORCE ORGANIZATION 2
2.00 Credit(s)
Organization of the United States Air Force. Focus on U.S. Defense Policies, military balance between U.S. and Soviet Forces as well as capabilities of Army, Navy and Reserve/Guard forces. Officerhip/Professionalism and Introduction to Flight are discussed. Laboratory Leadership activities.

211 - AIR FORCE HISTORY 1
1.00 Credit(s)
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
2.00 Credit(s)
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
4.00 Credit(s)
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 Credit(s)
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.

411 - AMERICAN NATIONAL SECURITY 1
4.00 Credit(s)
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
4.00 Credit(s)
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.

DEPARTMENT OF ARMY ROTC

(subject - Army ROTC (ARMY))

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

101 - THE ROTC AND ROLE OF THE U.S. ARMY
3.00 Credit(s)
The role of the United States Army within the National Defense Establishment. Strategic purposes, tactical mission, and capabilities in terms of manning, equipment and organization. An introduction to the art of military leadership, and the dimensions and responsibilities associated with positions of military leadership. No military service obligation or prerequisites. Freshmen and sophomores only.

107 - PROFESSIONAL MILITARY ETHICS
1.00 Credit(s)
A survey of the professional dimensions of military service, including the role and responsibilities of commissioned officers and ethical precepts of military leadership. The course includes an introduction to international laws and conventions which affect military activity. No military service obligation.

201 - SURVIVAL
3.00 Credit(s)
Study and application of skills needed in basic human survival situations. Topics include land navigation, survival skills, and first aid. No military obligation or prerequisite. Freshmen and sophomores only.
204 - MILITARY TACTICS
3.00 Credit(s)
This is an introductory course in military tactics. Topics include the Principles of War, Terrain Analysis, Fundamentals of offensive and defensive combat, a comparison of U.S. and Soviet combat power and Airland Battle Doctrine. No military obligation. Departmental permission required.

211 - STUDIES IN MILITARY SCIENCE
3.00 Credit(s)
This course includes examination of readings of classical and current military interest. Subjects that will be examined include: the emerging doctrine in military leadership, military organizations, the military profession with an emphasis on ethical issues, comparative military systems examining WW II's impact on the post-war armies of the Soviet Union, Germany, England and the United States. No military obligation. Departmental permission required.

301 - PROFESSIONALISM/LEADERSHIP
4.00 Credit(s)
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 Credit(s)
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 Credit(s)
Concepts and fundamentals of Army 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. Prerequisite: Departmental permission.

402 - UNIT MANAGEMENT, MILITARY WRITING AND CORRESPONDENCE
5.00 Credit(s)
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 movement of goods, and administrative details pertinent to newly commissioned lieutenants. Development and participation in field training exercises. Prerequisite: Departmental permission.

470 - AMERICAN MILITARY HISTORY
5.00 Credit(s)
A survey of American military history from the American Revolution to the present. The course will highlight the development of American military institutions, strategy, tactics, and policies throughout American history. Available to students under contract to the U.S. Army Reserve Training Corps. This course is a requirement for commissioning. Instructor permission only.

DEPARTMENT OF ART

(Department 151)

Subject - Art (ART)

Professors DeVore, West; Associate Professor Chesser (Chair); Assistant Professor Greau

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

The artist should be educated comprehensively through a program combining professional training and broad study in the liberal arts. It is on this premise that the student majoring in art: (1) receives as broad an understanding of art as possible; (2) becomes acquainted with historical and cultural knowledge of the past and present; (3) develops a working proficiency through mastery of the tools and skills of his profession; (4) develops personal modes of expression in the media of the visual arts; and (5) acquires an awareness of any competency in other academic disciplines.
A student seeking a Bachelor of Arts degree with a major in art must complete 76 hours for the major including 151, 152, 153, 161, 162, 210, 255, 265, 350, 489; six hours selected from 270, 280, 370, 379; nine hours selected from 250, 251, 355, 420; and nine hours selected from 305, 315, 325, 335.

A candidate for the Bachelor of Fine Arts degree must complete the following general requirements: A. Basic Requirements: Communication Skills (3 courses); Written Communication: English 110, 111 (taken in freshman year); Oral Communication: Speech 100; B. General Requirements (7 courses) Literature: English 204 ("Great Works of Literature," taken in sophomore year), Western Civilization 110, 111, Philosophy 100 or 102, Religion: 1 course from 105, 106, 107, 108, Foreign Language: 2 courses in one language; C. Distributional Requirements (5 courses) (courses in each of the following divisions, in addition to courses taken in A) (a) Fine Arts - two courses (or equivalent totaling 6 credit hours), one course from two disciplines in the division outside of the major area. (b) Social Sciences - one course: Psychology, Sociology, Political Science, Economics. (c) Natural Sciences/Mathematics-Computer Science - one biological science course and one physical science course.

Graduation Requirements: A student's total educational program must include the following: (1) Use of the computer or substantial exposure to or study of the uses and implications of computer technology. (2) At least one course which involves substantial exposure to or study of a non-Western or 3rd-world people, society, or culture. (3) At least three 1-hour physical education activity courses.

A candidate for the Bachelor of Fine Arts degree must also complete 97 hours for the major including 151, 152, 153, 161, 162, 210, 222, 255, 265, 350, 360, 489; nine hours selected from 270, 280, 370, 379; nine hours selected from 250, 251, 355, 420; and 12 hours selected from 305, 315, 325, 335. Students concentrating in ceramics, painting, printmaking, or sculpture must complete a minimum of 24 hours in the area of major concentration. Students concentrating in graphics design must complete three hours of 222, three hours of 223; three hours of 224; six hours from 142-240, 142-341; and 15 hours of 471.

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

Professional education requirements are listed by the Center for Teacher Education and Certification.

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.

000 - ORIENTATION
1.00 Credit(s)
Familiarization with the department, requirements for majors, planning program of courses, university catalog, and library. Required of all majors in the department.

100 - ART
3.00 Credit(s)
Analysis of the visual arts through selected works from the past and present. Illustrated lecture.

114 - ART FOR ELEMENTARY TEACHERS
3.00 Credit(s)
For the prospective elementary teacher with emphasis on the creative and mental growth of children in relationship to their work in art. Illustrated lectures.

115 - ART FOR ELEMENTARY TEACHERS
3.00 Credit(s)
For the prospective elementary teacher with emphasis on teaching demonstrations, media, methods in art, and lesson planning. Includes actual teaching experience. Prerequisite: ART 114.

151 - DRAWING 1
3.00 Credit(s)
Introduction to methods and media of drawing. Required of all art majors.

152 - DRAWING 2
3.00 Credit(s)
Extended problems of rendering in line and tone, studies in perspective.

153 - DRAWING 3
3.00 Credit(s)
Advanced problems in drawing involving complex forms including the human figure. Emphasis on the development of drawing as finished expressive work. May repeat for a total of 6 hours.
161 - DESIGN 1  
3.00 Credit(s)  
Introduction to and application of the elements and principles of plastic and graphic design. Required of all art majors.

162 - DESIGN 2  
3.00 Credit(s)  
Organization of elements and principles in three dimensions.

190 - SPECIAL TOPICS IN ART  
1.00 to 3.00 Credit(s)

210 - FIGURE DRAWING  
3.00 Credit(s)  
Drawing and anatomical study of the human figure. May repeat for credit to total of 12 hours.

221 - JEWELRY  
3.00 Credit(s)  
Use of a variety of materials in the making of jewelry. Emphasis on design and the development of technical skills. May repeat for credit once.

222 - GRAPHIC DESIGN 1  
3.00 Credit(s)  
Basic letter forms, emphasis on proportion, theory, rendering technique and applications of lettering in commercial art.

223 - GRAPHIC DESIGN 2  
3.00 Credit(s)  
A continuation of ART 222, in addition to problem solving associated with the making of advertising for print and other media, advertising and marketing skills, copywriting and editing, and other allied communication skills.

224 - GRAPHIC DESIGN 3  
3.00 Credit(s)  
Continuation of ART 222 and 223. Individual solutions to selected visual problems/projects. Media and technique varies. All assignments/solutions stress professional application and methods required of the graphic designer. Emphasis on conceptualizing and realizing within specifications, budget, and time frame. May repeat for credit once to total 6 hours. Prerequisites: ART 222 and/or 223.

250 - PAINTING 1  
3.00 Credit(s)  
An introduction to techniques and modes of painting. Emphasis on theory and use of color in oil or acrylic.

251 - PAINTING 2  
3.00 Credit(s)  
Techniques and modes of painting in oil. May repeat for credit to a total of 12 hours. Prerequisite: ART 250.

255 - CERAMICS 1  
3.00 Credit(s)  
Methods and techniques of forming clay products with emphasis on hand construction. Introduction to work on the potter's wheel. Decorating, glazing and firing of ceramic ware.

265 - SCULPTURE 1  
3.00 Credit(s)  
An introduction to the design and rendering of sculptural form in a variety of media and techniques. Emphasis on organizational problems of form and space.

270 - RELIEF PRINTMAKING 1  
3.00 Credit(s)  
Woodcut, linecut, wood engraving and other relief techniques. May repeat for a total of 9 hours. Prerequisites: ART 151, 152, 153, 161, and 162.

280 - SERIGRAPHY  
3.00 Credit(s)  
Methods and techniques. May repeat for total of 6 hours.

290 - SPECIAL TOPICS IN ART  
1.00 to 3.00 Credit(s)

305 - ANCIENT AND MEDIEVAL ART  
3.00 Credit(s)  
Art forms and styles from prehistoric times through the 14th century. Offered alternate years.

315 - RENAISSANCE AND BAROQUE ART  
3.00 Credit(s)  
The development of European Art and architecture from the 15th through the 18th century. Offered alternate years.

325 - IMPRESSIONISM-POST IMPRESSIONISM  
3.00 Credit(s)  
Emphasis on developments in French art between the Revolution of 1784 and 1900. Offered alternate years.

335 - MODERN ART  
3.00 Credit(s)  
Emphasis on formation and development of basic artistic movements from the beginning of the 20th century to the present. Offered alternate years.
350 - CERAMICS 2
3.00 Credit(s)
Methods and techniques of forming, decorating, glazing and firing clay bodies. Emphasis on wheel throwing. May repeat for a total of 9 hours credit. Prerequisite: ART 255

355 - WATERCOLOR
3.00 Credit(s)
Techniques and modes of painting in aqueous media. May repeat for credit to a total of 9 hours. Prerequisites: ART 151,152,161,162 or permission of the department.

360 - SCULPTURE 2
3.00 Credit(s)
Prerequisite(s): ART-265
The design and construction of more complex sculptures in a variety of media and techniques. May repeat to total of nine hours. Prerequisite: ART 265.

370 - LITHOGRAPHY
3.00 Credit(s)
Methods and techniques. May repeat to total credit of 6 hours. Prerequisites: ART 152, 162 and 210.

380 - INTAGLIO PRINTMAKING
3.00 Credit(s)
Methods and techniques of etching and engraving. May repeat to total of 9 hours. Prerequisites: ART 151, 152, 161 and 162.

390 - SPECIAL TOPICS IN ART
1.00 to 3.00 Credit(s)

410 - ADVANCED CERAMICS
3.00 Credit(s)
Directed study. May repeat to total credit of 12 hours. Prerequisite: 9 hours of ART 350.

415 - ADVANCED PRINTMAKING
3.00 Credit(s)
Directed study. May repeat to total credit of 12 hours. Prerequisite: 6 hours of ART 270.

420 - ADVANCED PAINTING
3.00 Credit(s)
Directed study. May repeat to total credit of 12 hours. Prerequisite: 6 hours of ART 250 and 251.

425 - ADVANCED SCULPTURE
3.00 Credit(s)
Directed study. May repeat to total credit of 12 hours. Prerequisite: 9 hours of ART 360.

457 - ART EDUCATION METHODS
4.00 Credit(s)
Laboratory-seminar dealing with materials, techniques, and methods of secondary classroom instruction in art. Meets professional education requirement in methods area. Includes 30 hours of field experience. Admission to the Teacher Education Program or approval of the Director of Teacher Education.

471 - INTERNSHIP
15.00 Credit(s)
Supervised field experience in an approved commercial art studio, agency, design department, museum, gallery or arts organization. Application for this course must be made through the student's advisor to the department chairman not later than one full quarter in advance of enrollment. Prerequisites: Junior or senior rank; ART 151, 152, 161, 162 and 222; and permission of the department.

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

490 - SPECIAL TOPICS IN ART
1.00 to 3.00 Credit(s)

494 - SEMINAR IN ART
1.00 to 3.00 Credit(s)

497 - INDEPENDENT STUDY IN ART
1.00 to 3.00 Credit(s)
DEPARTMENT OF BIOLOGICAL SCIENCES
(Department 121)

Subject - Biology (BIOL)

Professors Hoagstrom, Keiser (Chair), Moore, Nelson; Associate Professors Anderson, Warwick, Young; Visiting Assistant Professor Zafirova; Assistant Instructor Magaw; Adjunct Faculty, Riverside Hospital - Lange.

Students majoring in the biological sciences or in environmental studies 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, and preveterinary medicine), health technology, environmental testing, field biology, and secondary education. Core requirements for both degrees are Biology 121, 122, 123, 195; 494 or 295, 395 and 495; one advanced systematic survey course such as Biology 204, Biology 223, or a student may fulfill the systematic survey requirement by taking two of the following vertebrate special topics courses (Ichthyology, Herpetology, Ornithology and Mammalogy) from Biology 490; one advanced organismic course such as Biology 231, 301, 302, 310, or 331; one course with considerable cellular/molecular content such as Biology 217, 351 or Biology 210; one field biology course such as Biology 213, 251, 271, 371. 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: Biology 125, 204, 210, 213, 217, 223, 231, 232, 233, 251, 261, 262, 271, 290, 297, 301, 302, 303, 310, 311, 321, 331, 332, 333, 343, 351, 371, 372, 383, 423, 441, 451, 481, 490, 497. The independent study courses 297 and 497 and Internship 481 may count for only seven hours of the 16 biology elective hours.

Virology from the College of Pharmacy is accepted as an elective. Credit cannot be granted for both 231 and 331 or 232 and 332. Both degrees require a minimum of 47 biology hours. Departmental advisors will assist students in selecting relevant electives.

Both the B.A. and the B.S. degrees require a minimum of 25 hours of science cognates. Cognate requirements for the B.A. degree include three courses in chemistry, two courses in mathematics, and one course in physics, computer science or an additional mathematics course. The cognate requirements for the B.S. degree include three courses in chemistry, two courses in mathematics, one course in computer science, and an additional course in mathematics or computer science. For both degrees, courses in physics are strongly recommended. Specific science courses taught in the College of Engineering are acceptable cognates. Kinesiology 223 offered by the department of health and physical education may count with permission of the biological sciences faculty.

In addition to the major and cognate requirements, the B.S. degree requires 20 hours of science which are taken in the division of mathematical and natural sciences in the College of Arts and Sciences. These hours may also be satisfied by taking courses in the Colleges of Engineering and Pharmacy, but are subject to the approval of the biological sciences faculty.

The department of biological sciences also offers a major in environmental studies. Students studying in this area are planning on careers with industry and governmental agencies. Core requirements are Biology 121, 122, 123, 125, 195, 207, 251, 213, 223, 311, 481, and two Biology 490 courses from the following: Entomology, Ichthyology, Mammalogy, Ornithology, or Radiation Biology. One biology elective course is also required. Cognate courses must include one year of chemistry, including environmental chemistry (115), two courses in physics, 15 hours in mathematics and computer sciences, Psychology 100 and 316 or 337, nine hours of political science courses, Economics 100, Principles of Management 330, and twenty hours in the College of Engineering (301, 436, 453, 473, 474, 475). A course in environmental law is also required. Additional courses in chemistry are recommended.

Beginning with the 1993-94 school year, the secondary education student majoring in biology
is required to take the following biology courses: Biology 121, 122, 123, 204, 310, 317 or 351, 223, 251, 231 or 301 or 302 or 331, 311, 295, 395, 495 and at least 5 quarter hours of biology electives, to complete 48 quarter hours of biology. Science cognates for secondary education students must include: Chemistry 171, 172 and 173, Physics 100 or 211 or 231, Physics 250 and Engineering 453. Chemistry, physics and earth science courses must sum to 24 quarter hours. In addition, the secondary education student must take 3 quarter hours of electives in biology, chemistry, physics and/or earth science to complete a total of 75 quarter hours of science. Mathematics cognates for secondary education students must include: Mathematics 120 and 122 or 160 or 163 or 154. The secondary education student must also complete the education component of the program, including required field experiences and student teaching.

A student may minor in biology, biomedical sciences or environmental studies. For all three minors, a minimum of 30 quarter hours in biology is required. For the biology minor, the required courses are the same as for a major in biology with the exception that 195, 295, 395, 494 and 495 are not required. An additional two or three hours of biology electives are required to complete the requirement of 30 quarter hours of biology.

For the biomedical sciences minor, the required courses are Biology 121, 122, 231 or 331, 232 or 323 and 233 or 333. Electives must be chosen from Biology 210, 211, 301, 302, 303, 311, 321, 343, 351, 441, 490 (Parasitology) and Pharmacy 361 or 362 and 462.

For the environmental studies minor, the required courses are Biology 121, 122 and 125. Electives must be chosen from Biology 195, 207, 213, 223, 251, 271, 311, 423 and certain special topics courses (Biology 490).

Required cognate courses for all minors include 12 quarter hours in the division of mathematics and natural sciences, not including biology.

The Ohio Northern University Nature Center, a 70-acre farm in Tuscarawas County, Ohio, serves as a biology field station. The facility is located near Ragersville, and it includes a century-old house with eight rooms and a laboratory area. The hills, valleys, woods, fields, stream, and pond provide an excellent opportunity for teaching, study, and research.

The department of biological sciences offers a medical technology program leading to a Bachelor of Science in Medical Technology. The affiliate hospital is Riverside Hospital in Toledo, Ohio. The college requirements for this degree are the same as for the general B.S. degree with the exception that a second math/computer science course is not required and only 2 of 3 general elective courses are required. Departmental requirements include Biology 121, 122, 123, 210, 223, 301, 311, 321, 331, 343, 494 or 295 and 495 plus 8 hours of advanced biology electives. Courses in other areas of natural science include Chemistry 171, 172, 173, 231, 232, 233 and Biochemistry 341 offered in the College of Pharmacy, two math courses, one computer science course, and a basic electronics course, Physics 241. The B.S. in Medical Technology degree is awarded after the successful completion of the clinical year from an accredited school of medical technology. The medical technology student may choose to graduate with a major in biology, and then after graduation complete the clinical year. The student interested in this option should consult the medical technology advisor. The courses taken during the clinical year at Riverside Hospital are listed below and numbered from 460 to 477.

The department of biological sciences has developed an Internship program in which it has formed working relationships with a number of organizations and institutions. For seniors, the one quarter internship provides an off-campus practical experience in a field of biology with the earning of 15 hours of credit. Examples of possible internships include toxic waste control, environmental testing, zoo animal care and management, wildlife and fisheries management, laboratory research, cardiology, cardiopulmonary 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.

121 - GENERAL BIOLOGY
4.00 Credit(s)
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. (Formerly BIOL 100).

122 - INTRODUCTION TO ZOOLOGY
4.00 Credit(s)
Prerequisite(s): BIOL-121
A basic introduction to zoology including the classification of major animal groups. The structure of animals is approached from a systems viewpoint. (Formerly BIOL 112). Prerequisite: BIOL 121.

56 BIOLOGICAL SCIENCES
123 - GENERAL BOTANY/MYCOLOGY
4.00 Credit(s)
A survey of microbes, fungi and plants emphasizing classification and evolutionary relationships. The life histories, anatomy and physiology of fungi and plants will also be closely examined. (Formerly BIOL 113). Prerequisite: BIOL 121.

124 - INTRODUCTION TO HUMAN ANATOMY AND HISTOLOGY
4.00 Credit(s)
Basic introduction to the gross anatomy and histology of the human body systems. Prerequisites: BIOL 121 and 122.

125 - ENVIRONMENTS OF MAN
4.00 Credit(s)
The interaction of man and his surroundings with an emphasis on the problems arising from increasing human population, pollution, and resource use. (Formerly BIOL 244).

190 - SPECIAL TOPICS IN BIOLOGICAL SCIENCES
1.00 to 3.00 Credit(s)

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

204 - SYSTEMATIC PLANT SURVEY (2+4)
4.00 Credit(s)
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 Credit(s)
A survey of 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)
3.00 Credit(s)
Recognition and identification of local biotic communities and their inhabitants. Field study emphasized. Prerequisites: BIOL 122 and/or permission of the instructor. instructor.

217 - INTRODUCTION TO MOLECULAR BIOLOGY (3+3)
4.00 Credit(s)
The study of 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 Credit(s)
Invertebrate relationships including morphology, physiology, life cycles and taxonomy. Prerequisite: BIOL 122.

231 - ANATOMY AND PHYSIOLOGY 1 (3+3)
4.00 Credit(s)
Basic principles of human structure and function, including relevant aspects of exercise physiology. Includes cell physiology, metabolism, histology, skin, bone and neural anatomy and physiology. Prerequisite: BIOL 122.

232 - ANATOMY AND PHYSIOLOGY 2 (3+3)
4.00 Credit(s)
Continuation of 231. Topics covered include blood, immunology, renal system and digestive system, endocrinology and reproductive system. Prerequisite: BIOL 231.

233 - EXERCISE PHYSIOLOGY (3+3)
4.00 Credit(s)
The physiological basis of physical education and athletics. Course primary emphasis is on exercise physiology. Topics covered include thermal regulation, muscle physiology, respiratory physiology, cardiovascular physiology and special topics of exercise physiology. Laboratory primarily covers techniques for evaluating physical conditioning as related to lecture topics. Prerequisites: BIOL 231 or 232.

251 - PRINCIPLES OF ECOLOGY
4.00 Credit(s)
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 and 123.
261 - BIOGEOGRAPHY 1
3.00 Credit(s)
Study of 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. Offered alternate years: 1994-95. Permission of instructor required. Prerequisites: BIOL 122 and 123.

262 - BIOGEOGRAPHY 2
3.00 Credit(s)
Continuation of Biogeography 1. Permission of instructor required. Offered alternate years: 1994-95. Prerequisite: BIOL 261.

271 - INTRODUCTION TO MARINE BIOLOGY
4.00 Credit(s)
An introductory overview of the various 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. Permission of instructor and/or prerequisites required. Prerequisite: BIOL 122.

290 - SPECIAL TOPICS IN BIOLOGICAL SCIENCES
1.00 to 3.00 Credit(s)
Grading system at the discretion of the instructor.

295 - BIOLOGICAL LITERATURE RESEARCH
1.00 Credit(s)
Selection of a research project for the student's 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.

297 - INTRODUCTION TO BIOLOGICAL INVESTIGATIONS
1.00 to 3.00 Credit(s)
Minor investigations for qualified freshmen and sophomores. Graded S-U.

301 - DEVELOPMENTAL ANATOMY (2+4)
4.00 Credit(s)
A study of the human embryonic and fetal development supplemented by laboratory studies of chick, pig and mouse embryonic development. Prerequisite: BIOL 122, or its equivalent.

302 - HUMAN ANATOMY (2+4)
4.00 Credit(s)
(Formerly 300). A study of the gross anatomy of the human body and body systems. Prerequisite: BIOL 122 or its equivalent. Offered alternate years: 1993-1994.

303 - HISTOLOGY (3+3)
4.00 Credit(s)
(Formerly 300). A study of the tissues that comprise the organ systems of the human body. Prerequisite: BIOL 122 or its equivalent. Offered alternate years: 1994-95.

305 - ENVIRONMENTAL TOXICOLOGY
3.00 Credit(s)
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
4.00 Credit(s)
Introduction to general plant anatomy, morphology and cellular ultrastructure. Structures from all major plant organs will be examined in an evolutionary and ecological context. Prerequisites: BIOL 121 and 123. Offered alternate years: 1993-94.

310 - PLANT PHYSIOLOGY (3+3)
4.00 Credit(s)
An examination of various plant functions. Water relations, photosynthesis, metabolism and hormonal regulation of growth, development and stimulus response will be studied in detail with emphasis on cellular structure/function relationships. Prerequisites: BIOL 123 and CHEM 231 or is required. Offered alternate years: 1994-95. Permission of the instructor required.

311 - MICROBIOLOGY
4.00 Credit(s)
General survey of 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.
321 - INTRODUCTION TO IMMUNOLOGY
4.00 Credit(s)
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. BIOL 124 recommended. Prerequisites: BIOL 121 and 122.

331 - PHYSIOLOGY 1 (3+0)
3.00 Credit(s)
Co-requisite(s): CHEM- 231
A structural and functional approach to understanding the human body at an advanced level of study. 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. Co-requisite: CHEM 231.

332 - PHYSIOLOGY 2 (3+0)
3.00 Credit(s)
Continuation of 331. Prerequisite: BIOL 331. Co-requisite: CHEM 232.

333 - PHYSIOLOGY 3 (3+0)
3.00 Credit(s)
Continuation of 332. Prerequisite: BIOL 332. Co-requisite: CHEM 332.

334 - PHYSIOLOGY LAB 1 (0+3)
1.00 Credit(s)
Corequisite: BIOL 331.

335 - PHYSIOLOGY LAB 2 (0+3)
1.00 Credit(s)
Corequisite: BIOL 332.

336 - PHYSIOLOGY LAB 3 (0+3)
1.00 Credit(s)
Corequisite: BIOL 333.

343 - MICROTECHNIQUE (2+3)
3.00 Credit(s)
Principles and procedures used in the preparation of biological specimens for microscopic study. Open to students majoring in Biology. Offered alternate years: 1994-95.

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

371 - ADVANCED MARINE BIOLOGY
4.00 Credit(s)
A detailed study of 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 Credit(s)
Selected areas of marine biology may be selected by the student for in-depth study. Specific study areas include marine ichthyofauna, marine plankton, marine arthropods, marine molluscs, marine phycology, marine mammalogy, marine physiology and others. A field experience will be required. Prerequisites: BIOL 371 and permission of the instructor.

383 - ANIMAL BEHAVIOR (ETHOLOGY) (2+2)
3.00 Credit(s)
Basic principles of the behavior and ethology of invertebrates and vertebrates, stressing observational and descriptive techniques. Offered alternate years: 1994-95. Prerequisites: BIOL 121, 122 and 223.

390 - SPECIAL TOPICS IN BIOLOGICAL SCIENCES
1.00 to 3.00 Credit(s)

395 - BIOLOGICAL RESEARCH REPORT
1.00 Credit(s)
Working with a research advisor, the student will investigate the project proposed in BIOL 295, and will prepare and submit a written report in approved scientific format. This report must detail the progress of the student's senior thesis research including a literature review and work completed to date. Attendance at all departmental and thesis seminars required. Prerequisite: BIOL 295.

423 - TOPICS IN ECOLOGY
3.00 Credit(s)
A study of the current literature on selected topics in Ecology. Prerequisite: BIOL 251 or permission of instructor. Offered alternate years: 1993-1994.

441 - PHYSIOLOGY OF AGING (1+0)
1.00 Credit(s)
A seminar format with readings, lectures and discussions concerning known physiological processes of aging in the systems of the human body. Prerequisites: BIOL 231, 232 and 233 or BIOL 331, 332 and 333 or with permission of the instructor. Offered on demand.
451 - ADVANCED TOPICS IN CELL BIOLOGY
(3+0)
3.00 Credit(s)
A study of the current literature on selected topics in cell biology. No topic will be repeated in a four year period, so the course may be repeated for credit. Prerequisite: BIOL 351 or PHBS 342. Offered on demand.

481 - INTERNSHIP PROGRAM
15.00 Credit(s)
Practical experience in areas such as wildlife biology, zookeeping, environmental monitoring, cardiopulmonary 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 15 quarter hours. All departments involved must agree with the internship arrangement. Prerequisites: normally restricted to seniors, must be approved by biological sciences faculty, and the student must have a minimum of 3 years work in the fundamentals of biology and related areas.

490 - SPECIAL TOPICS IN BIOLOGICAL SCIENCES
1.00 to 4.00 Credit(s)
Courses in the following disciplines: entomology, herpetology, ichthyology, mammalogy, parasitology, ornithology, North American mammals, radiation biology and plant taxonomy.

494 - BIOLOGY SENIOR SEMINAR
1.00 Credit(s)
The seminar will consist of the presentation of a library research topic in both written and oral presentation formats. Additionally a biology comprehensive examination must be passed with a grade of C or better. Prerequisite: Junior or senior status.

495 - SENIOR THESIS SEMINAR
1.00 Credit(s)
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 Credit(s)
Graded S-U.
469 - CLINICAL HEMATOLOGY/COAGULATION LECTURE
4.00 Credit(s)
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 Credit(s)
Laboratory instrumentation and procedures to correlate with the lectures.

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

472 - CLINICAL CHEMISTRY LABORATORY
8.00 Credit(s)
Laboratory instrumentation and procedures to correlate with the lectures.

473 - URINALYSIS LECTURE
1.00 Credit(s)
Physiology of urinary system, related diseases and correlation to disease states.

474 - URINALYSIS LABORATORY
1.00 Credit(s)
Laboratory methods and instrumentation to correlate with lectures.

475 - LABORATORY MANAGEMENT LECTURE P/F
.00 Credit(s)
Theory and discussion of supervision and management.

476 - CLINICAL PATHOLOGY
1.00 Credit(s)
Correlation of clinical laboratory findings with different human physiological states. Consists of case studies, review sessions, management and education orientation. Prerequisite: Enrollment limited to medical technology interns.

477 - CLINICAL PATHOLOGY SEMINAR
1.00 Credit(s)
Consists of presentation and discussion of special topics and current developments in clinical laboratory medicine. Topics are presented by students and guest lecturers. Prerequisite: Enrollment limited to medical technology interns.

DEPARTMENT OF CHEMISTRY

(122)

Subject - Chemistry (CHEM)

Professors Haight (Interim Chair), Canagaratna, Hawbecker, Kurtz, Lamb; Associate Professors Hruschka, J. Peterson, Sadurski; Visiting Assistant Professor Richards; Visiting Instructor Garver.

The objectives of this department are to help serve the cultural need for an understanding of science in our modern society; to provide the basic preparation in chemistry for those who plan to enter the chemical industry, the teaching profession, pursue graduate study in chemistry or related fields, and to serve those who need an understanding of the fundamentals of this physical science as a prerequisite to various professional studies and career goals.

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

Departmental Majors Four major programs are available in the department of chemistry. They are the American Chemical Society certified program, the basic program, the modified program, and the biochemistry program.

The American Chemical Society Certified Major in Chemistry The student who wishes to be certified as a professional chemist by the American Chemical Society may complete a program leading to either the bachelor of science or the bachelor of arts degree. This certified program is designed to prepare students for direct entry into the chemical industry or for graduate studies in chemistry. The following chemistry core courses are required for the certified degree: Chemistry 000, 181-182-183, 241-242-243, 300, 341-342-343, 304, 324, 351 and 494. To this core must be added a "professional" component which includes Chemistry 451 and 462 plus a minimum of 9 credit hours from among the following: Chemistry 311; Chemistry 473; Chemistry 474; Chemistry 481-482-483, and advanced biochemistry, mathematics, computer science, or physics courses approved by the department. The following cognate courses must also be added: Mathematics 163, 261, 262, and 272; Computer Science 134 or 230, and Physics 231-232-233 with related laboratories.
The Basic Major Basic bachelor of science and bachelor of arts degree programs are also available for those who wish to become chemists, follow a preprofessional program such as premedicine or pursue graduate studies. The student who wishes to complete a basic major must complete the chemistry core and the cognate courses listed above. The "professional" component is not required.

The Modified Major A modified major program is available for those who wish to prepare for related areas such as certain medical science specialties, sales or management in the technical industries, patent law, scientific communication and information retrieval, and environmental science. Entrance into the modified major program must be approved by the departmental faculty. It is expected that a second major or teacher certification will be completed along with this modified major. The specific modified program will dictate whether the BS or BA degree is chosen. This program permits more course selection in areas that support the student's chemistry-related career goal. The student participates in designing his or her own program within the following framework:

Chemistry 000, 181-182-183, 241-242-243, 494, plus three courses from among 304, 311, 321 or 324, 337, 351, and a minimum of 12 credit hours in 300-400 level courses in the division of mathematics and natural sciences or other 300-400 level courses acceptable to the department. If Chemistry 311 is chosen as one of the three courses noted above, the other two courses must be distributed as follows: either 304 or 321 or 324 and either 337 or 351. Biochemistry 341 plus 342 may be substituted for Chemistry 311. In addition, two of the following three cognate units must be selected: 1. Physics 211-212-213 or 231-232-233 with related laboratories; 2. Biology 121-122-123; 3. three mathematics courses at the level of Mathematics 120 and above. It is recommended that the college computer science requirement be met by taking a course in the department of mathematics and computer science.

The American Chemical Society Certified Major in Biochemistry Students who complete the Bachelor of Science degree in biochemistry will be certified by the American Chemical Society. This program is designed to prepare students for professional employment as biochemists or for graduate studies in biochemistry and related fields. The following core courses are required: Chemistry 000, 181-182-183, 241-242-243, 300, 341-342-343, 311, 321, 351 and 494. Also required is Biology 121-122-123. To this core must be added Chemistry 312 or Biochemistry 342 and Chemistry 411, 414, 415 and 416 plus at least two different courses from among: Biology 210, 311, 321, 351 and 451. The following cognate courses must also be added: Mathematics 163, 261, 262 and 272; Computer Science 134 or 230, and Physics 231-232-233 with related laboratories.

Minor in Chemistry A student wishing to receive a minor in chemistry should complete the following: Chemistry 181-182-183 (or 171-172-173) and 241-242 (or 231-232) plus three additional courses from among Chemistry 243 (or 233), 304, 321 or 324, 337, 351, 363, and Chemistry 311 or Biochemistry 341.

Minor in Biochemistry A student wishing to receive a minor in biochemistry should complete the following: Chemistry 181-182-183 (or 171-172-173), 241-242-243 (or 231-232-233), 311 or Biochemistry 341, Chemistry 312 or Biochemistry 342, and Biochemistry Laboratory 414-415.

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

100 - CHEMISTRY (3+1)
3.00 Credit(s)
A theoretical and practical introduction to chemistry. How chemists explain the macroscopic world using molecular level models and how this knowledge applies to everyday life. Chemistry 171 recommended for science majors. Credit may be received for either CHEM 100 or 171, but not for both. Credit may be received for either CHEM 100 or 121, but not for both.

108 - BASICS OF CHEMISTRY
4.00 Credit(s)
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 121 or 171. Students who have had high school chemistry ordinarily begin with CHEM 121 or 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 (3+0)
3.00 Credit(s)
An introduction to the chemical nature of the major groups of biological molecules and to their activities in living systems. Credit may be received for either CHEM 114 or PHBS 341 and 342, but not for both. Offered alternate years. CHEM 100 or 162 or 171.

115 - ENVIRONMENTAL CHEMISTRY (3+0)
3.00 Credit(s)
Chemical aspects of the natural and polluted environment. Particular emphasis is given to air and water pollution. Prerequisite: CHEM 100 or 162 or 171.

121 - CHEMICAL PRINCIPLES 1
4.00 Credit(s)
The first course in a sequence for pharmacy students emphasizing basic principles of chemistry. Students planning to complete basic science or pre-medical science programs which require CHEM 231 and above must take introductory CHEM 171 or 181. General principles of chemistry, including atomic theory, periodicity, stoichiometry, compound formation and equation writing. Laboratory is terminal in the chemistry sequence and emphasizes basic measurement and laboratory skills. Credit may be received for either CHEM 100 or 121, but not for both. High school chemistry or the equivalent is required.

122 - CHEMICAL PRINCIPLES 2
4.00 Credit(s)
Continuation of CHEM 121. The lecture emphasizes states of matter and the types of chemical reactions. The lab emphasizes the measurement and observation of the phenomena discussed in lecture. Prerequisite: CHEM 121 or 171.

123 - CHEMICAL PRINCIPLES 3
4.00 Credit(s)
A continuation of CHEM 122. The lecture emphasizes factors controlling the energetics, spontaneity, extent and rate of chemical reactions. The lab emphasizes the measurement and observation of concepts discussed in lecture. Prerequisite: CHEM 122 or 172.

162 - CHEMISTRY-CONCEPTS AND APPLICATIONS 1 (4+3)
5.00 Credit(s)
Fundamental concepts of chemistry for engineering students. Basic chemical theories applied to practical situations. Laboratory reinforces the lecture program. Prerequisites: High school chemistry, MATH 261; 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+0)
3.00 Credit(s)
Chemical properties of the elements and the application of those properties to such problems as synthesis, analysis, industrial processes and environmental quality. Prerequisite: CHEM 162.

171 - INTRODUCTORY CHEMISTRY 1 (4+3)
5.00 Credit(s)
The first course in a sequence for students majoring in the basic sciences or enrolled in pre-medical science programs. Fundamental principles of chemistry in terms of the atomic theory and its application to compound formation, bonding, structure, acid-base and oxidation-reduction reaction chemistry. The laboratory relates physical observations to principles presented in lecture. Credit may be received for either CHEM 100 OR 171, but not for both. High school chemistry or the equivalent is required.

172 - INTRODUCTORY CHEMISTRY 2 (4+3)
5.00 Credit(s)
Physical principles of chemistry including spectroscopy, thermodynamics, kinetics, and the study of the states of matter. The laboratory introduces quantitative measurements to experiments designed to illustrate principles presented in lecture. Prerequisite: CHEM 171.

173 - INTRODUCTORY CHEMISTRY 3 (4+3)
5.00 Credit(s)
Qualitative and quantitative aspects of chemical reactivity including general and ionic equilibrium, electrochemistry, descriptive inorganic reaction chemistry and nuclear chemistry. The laboratory illustrates qualitative and quantitative behavior and group trends of chemical species. Prerequisite: CHEM 162 or 172.

181 - INTRODUCTORY CHEMISTRY FOR MAJORS 1 (4+3)
5.00 Credit(s)
Co-requisite(s): CHEM-184
The same lecture and laboratory as CHEM 171.

182 - INTRODUCTORY CHEMISTRY FOR MAJORS 2 (4+3)
5.00 Credit(s)
The same lecture and laboratory as CHEM 172. Prerequisite: CHEM 181.

183 - INTRODUCTORY CHEMISTRY FOR MAJORS 3 (4+3)
5.00 Credit(s)
The same lecture and laboratory as CHEM 173. Prerequisite: CHEM 182.
221 - FUNDAMENTALS OF ORGANIC CHEMISTRY 1 (3+0)
3.00 Credit(s)
The first course of a sequence for pharmacy students in the fundamentals of organic chemistry. Students planning to complete basic science majors or pre-medical science programs must take Organic CHEM 231 or 241. Emphasis is on the concepts of bonding, structure and nomenclature of the hydrocarbons including stereochemistry and the basics of reaction mechanisms. Prerequisite: CHEM 123 or 173.

222 - FUNDAMENTALS OF ORGANIC CHEMISTRY 2 (3+0)
3.00 Credit(s)
A continuation of CHEM 221. The chemistry of aliphatic and aromatic cyclic hydrocarbons, alcohols, ethers, aldehydes and ketones including basic application of spectroscopy to structure determination. Prerequisite: CHEM 221.

223 - FUNDAMENTALS OF ORGANIC CHEMISTRY 3 (3+0)
3.00 Credit(s)
A continuation of CHEM 222. The chemistry of carboxylic acids and their derivatives, phenols, amines, heterocycles and active methylene compounds. Introduction to biomolecules including fats, carbohydrates, amino acids and proteins. Prerequisite: CHEM 222.

231 - ORGANIC CHEMISTRY 1 (3+3)
4.00 Credit(s)
The first organic chemistry course in a sequence for students majoring in the basic sciences or enrolled in pre-medical science programs. Applications of the concepts of bonding, structure, synthesis and mechanisms to the chemistry of organic compounds. Emphasis is on bonding, nomenclature, acid-base theory, stereoisomerism, and the chemistry of alkanes, alkenes, alkynes and alkyl halides. Laboratory emphasizes special techniques including chromatography and synthetic procedures pertaining to substitution and elimination reactions. Prerequisite: CHEM 173 or 183 or approval of the department chairman.

232 - ORGANIC CHEMISTRY 2 (3+3)
4.00 Credit(s)
Spectroscopy and the chemistry of alcohols, carbonyl compounds, carboxylic acids and derivatives, lipids, polyenes and terpenoids. Laboratory features organic synthesis and structural determinations which illustrate the concepts from the lecture. Prerequisite: CHEM 231 or 241.

233 - ORGANIC CHEMISTRY 3 (3+3)
4.00 Credit(s)
A study of aromatic compounds, active methylene chemistry, polymerization and the functional behavior of organic nitrogen compounds, carbohydrates, amino acids and proteins. Laboratory features multistep synthesis and qualitative organic analysis. Prerequisite: CHEM 232 or 242.

241 - ORGANIC CHEMISTRY 1 - MAJORS (3+3)
4.00 Credit(s)
Co-requisite(s): CHEM-244
The same lecture and laboratory as CHEM 231. Prerequisite: CHEM 173 or 183.

242 - ORGANIC CHEMISTRY 2 - MAJORS (3+3)
4.00 Credit(s)
Co-requisite(s): CHEM-245
The same lecture and laboratory as CHEM 232. Prerequisite: CHEM 231 or 241.

243 - ORGANIC CHEMISTRY 3 - MAJORS (3+6)
5.00 Credit(s)
Co-requisite(s): CHEM-246
The same lecture as CHEM 233 with a separate laboratory emphasizing qualitative organic analysis and the use of modern instrumentation in the separation and identification of organic compounds. Prerequisite: CHEM 232 or 242.

290 - SPECIAL TOPICS IN CHEMISTRY
1.00 to 3.00 Credit(s)
Can be repeated as the topic varies.

297 - INDEPENDENT STUDY IN CHEMISTRY
1.00 to 3.00 Credit(s)
Can be repeated for a maximum of 6 credit hours. Prerequisite: Approval of the department chairman.

300 - INTRODUCTION TO CHEMICAL RESEARCH (1+0)
.00 Credit(s)
An introduction to the concept of chemical research including a survey of 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 marked S-U. Prerequisite: Junior standing or approval of the department chairman.
304 - ORGANIC SYNTHESIS (2+6)
4.00 Credit(s)
An intermediate course in synthetic methods. Lecture emphasizes major carbon skeletal alteration techniques and modern methods of interconverting functional groups. Laboratory consists of planning and executing multistep syntheses of graded complexity. Use of synthetic literature is emphasized. Prerequisite: CHEM 233 or 243.

311 - CHEMISTRY OF BIOLOGICAL MOLECULES (4+0)
4.00 Credit(s)
A study of the structures and properties of the major classes of biological molecules with emphasis on the physical properties of macromolecules. Topics include thermodynamics, enzyme kinetics and mechanisms, isolation and characterization techniques, and an introduction to the design and regulation of metabolic pathways. Prerequisites: CHEM 233 or 243 and MATH 262.

312 - CHEMISTRY OF METABOLISM (4+0)
4.00 Credit(s)
An introduction to intermediary metabolism with an 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 Credit(s)
The same lecture as CHEM 324 with a separate laboratory program. Lecture emphasizes preparation, structures, properties and reactions of main group and transition metal elements and their compounds. The laboratory involves the application of fundamental techniques to the synthesis of inorganic compounds and their characterization using standard instrumental methods. Prerequisite: CHEM 243 or approval of the department chairman.

337 - ELEMENTS OF PHYSICAL CHEMISTRY (4+0)
4.00 Credit(s)
A survey of principles and applications of selected areas of physical chemistry, including thermodynamics and kinetics. Intended for students in the modified chemistry major or the chemistry minor who wish to enhance their chemistry background. Prerequisites: CHEM 163 or 232 or 242 and three courses from the Department of Mathematics and Computer Science. Offered alternate years.

341 - PHYSICAL CHEMISTRY 1 (3+3)
4.00 Credit(s)
Classical thermodynamics. Laboratory illustrates principles and exemplifies applications. A knowledge of computer programming is recommended. Prerequisites: CHEM 233 or 243; PHYS 231, 232 and 233 with related laboratories, and MATH 262 and 272.

342 - PHYSICAL CHEMISTRY 2 (3+3)
4.00 Credit(s)
Quantum mechanics. Laboratory illustrates applications in spectroscopy. A knowledge of elementary differential equations is recommended. Prerequisite: CHEM 341.

343 - PHYSICAL CHEMISTRY 3 (3+3)
4.00 Credit(s)
Statistical thermodynamics, kinetic molecular theory and chemical kinetics. Laboratory illustrates principles and applications. Prerequisite: CHEM 342.
351 - INTERMEDIATE QUANTITATIVE ANALYSIS (2+6)
4.00 Credit(s)
The practice and principles of modern chemical methods of analysis; an introduction to instrumental methods of analysis. A terminal course for the non-major and an intermediate course for the major. Prerequisite: CHEM 173 or 183.

363 - APPLICATIONS OF CHEMICAL INSTRUMENTATION (1+5)
3.00 Credit(s)
An introduction to the principles and methods of instrumental measurements for the analysis of real samples. The integrated laboratory and lecture deal with the collection, preparation and analysis of environmental, geological, biological, and industrial samples. Automated sequencing and process analysis are also discussed. Prerequisite: CHEM 163 or 233 or 243. Offered in alternate years.

390 - SPECIAL TOPICS IN CHEMISTRY
1.00 to 3.00 Credit(s)
Can be repeated as the topic varies.

411 - ADVANCED TOPICS IN BIOCHEMISTRY (3+0)
3.00 Credit(s)
Studies on the biochemical basis for hormone action, gene expression and photosynthesis. Recombinant DNA techniques are emphasized. Prerequisites: CHEM 312 or PHBS 342 and CHEM 343 or approval of the department chairman.

414 - BIOCHEMISTRY LABORATORY 1 (0+6)
2.00 Credit(s)
A laboratory course featuring the chemical and physical properties of biological molecules plus an introduction to enzyme kinetics and metabolism. Prerequisite: CHEM 312 or PHBS 342.

415 - BIOCHEMISTRY LABORATORY 2 (0+6)
2.00 Credit(s)
An intermediate laboratory course featuring enzyme and RNA isolation and the arrangement of simple biochemical components into macromolecular structures. Prerequisites: CHEM 312 and 414 or PHBS 342.

416 - BIOCHEMISTRY LABORATORY 3 (0+6)
2.00 Credit(s)
An advanced laboratory course featuring modern methods of nucleic acid analysis with an emphasis on recombinant DNA techniques. Prerequisites: CHEM 411,415.

451 - ADVANCED INORGANIC CHEMISTRY (3+3)
4.00 Credit(s)
The study of the theory, bonding, spectroscopy, and reaction mechanisms of inorganic compounds and an introduction to organometallic chemistry. The laboratory involves the application of modern laboratory techniques and equipment in the preparation and study of inorganic compounds. Prerequisites: CHEM 324 and 343 or approval of the department chairman.

462 - ADVANCED ANALYTICAL CHEMISTRY (3+3)
4.00 Credit(s)
Theoretical-experimental study of modern methods of instrumental analysis. The physico-chemical principles as well as the design and use of chemical instrumentation. Laboratory stresses independent, investigative experimentation. Prerequisites: CHEM 343 and 351 or approval of the department chairman.

473 - ADVANCED TOPICS IN PHYSICAL CHEMISTRY (3+0)
3.00 Credit(s)
Advanced studies in theories and applications of selected topics in physical chemistry. A knowledge of computer programming is recommended. Prerequisite: CHEM 343.

474 - THEORETICAL ORGANIC CHEMISTRY (3+0)
3.00 Credit(s)
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 chairman.

481 - SENIOR RESEARCH 1
2.00 Credit(s)
Prerequisites: CHEM 300 and approval of the department chairman.

482 - SENIOR RESEARCH 2
2.00 Credit(s)
Prerequisites: CHEM 481 and approval of the department chairman.

483 - SENIOR RESEARCH 3
2.00 Credit(s)
Prerequisites: CHEM 482 and approval of the department chairman.
490 - SPECIAL TOPICS IN CHEMISTRY
1.00 to 3.00 Credit(s)
Can be repeated as the topic varies.

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

497 - INDEPENDENT STUDY IN CHEMISTRY
1.00 to 3.00 Credit(s)
Can be repeated for a maximum of 6 credit hours. Prerequisite: CHEM 300 and approval of the department chairman.
DEPARTMENT OF
COMMUNICATION ARTS

(Department 153)

Subject - Communication Arts (COMM)

Associate Professors Bayliss, Johnson, Riess (Chair), Roberts; Assistant Professors Gainey, Gisclair; Instructor Dunlevy-Shackleford

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.

The course offerings of the department are structured around a series of core courses which are fundamental to an understanding of how man communicates theoretically, practically, and aesthetically. Students majoring in Communication Arts build upon these core courses in pursuing a concentration particular to their professional and educational goals. Concentrations are offered in the following areas:

- Speech Communication
- Theatre
- Public Relations
- Broadcasting
- Musical Theatre

Some concentrations require internships; some concentrations also require cognate courses outside the department. A formal concentration need not be pursued, in which case a student would pursue a generalist program. A generalist program should be selected in consultation with an advisor.

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

Beyond the traditional classroom experiences, 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. In the Public Relations Student Society of America, students gain professional learning experiences through networking, workshops, campaign exposure, and service. In forensics, formal debate is conducted on both national topics and off-topic arguments, and individual events include competition in persuasive, informative, impromptu, and extemporaneous speaking, and oral interpretation of literature. Students may also act and engage in technical work on musicals, readers theater, new works, and traditional plays. Through all these activities, the department provides many opportunities for student involvement.

Departmental Curriculum
The curriculum of a Communication Arts major is divided into four elements:

I. Communication Arts Core Requirements
II. Concentration Requirements
III. Concentration Electives (Departmental)
IV. Concentration Cognates (non-Departmental)

Communication Arts Core Required of all majors and minors (12 hours).
Introduction to Theatre (CA 106)
Introduction to Public Relations (CA 130)
Introduction to Broadcasting (CA 150)
Public Speaking (CA 211)

Communication Arts with Speech Communication Concentration (51 hours)

I. Communication Arts Core Requirements (12 hours)

II. Concentration Requirements: (27 hours)
Oral Interpretation (CA 160)
Interviewing (CA 221)
Organizational Communication (CA 223)
Interpersonal Communication (CA 225)
Communication Theory (CA 230)
Parliamentary Procedure (CA 240)
Persuasive Speaking (CA 311)
Group Communication (CA 321)
Internship (CA 335) 3 hrs. min.
or
Independent Study (CA 499) 3 hrs. min.

III. Concentration Electives (Departmental) (12 hours)
Choose Four
Argumentation (CA 121)
Bus. & Prof. Spkg. (CA 315)
Voice & Diction (CA 340)
Readers Theatre (CA 361)
Broadcast, Media & Soc. (CA 453)
**Speech Team: Ind. Events (CA 201)
(3 hrs. min.)
**Speech Team: Debate (CA 202)
(3 hrs. min.)
**Required if student is seeking secondary teaching certification.

**Communication Arts with Theatre
Concentration (58-59 hours)

I. Communication Arts Core Requirements
(12 hours)

II. Concentration Requirements: (18 hours)
Acting (CA 260)
Theatre Technology (CA 275)
Theatre History I (CA 291)
Theatre History II (CA 292)
Production Analysis (CA 385)
Directing (CA 386)

III. Concentration Electives (21 hours)
A. (Choose two)
Oral Interpretation (CA 160)
Acting (a second course) (CA 260)
Voice and Diction (CA 340)
Readers Theatre (CA 361)
Special Topics (CA)

B. (Choose two)
Make-up (CA 278)
Stage Management (CA 285)
Scene Design (CA 375)
Lighting Design (CA 376)
Costume Design (CA 377)

C. (Choose one)
TV Prog. and Prod. (CA 253)
Cinema (CA 395)
Adv. Radio and TV Production (CA 454)
Arts Management (CA 480)
Media Writing: Playwriting (CA 356)

D. (Choose min. of 2; total 6 hrs.)
Performance Practicum (CA 261)
Production Practicum (CA 276)
Internship (CA 335)
Design Practicum (CA 378)
Directing Practicum (CA 387)

IV. Cognates (7-8 hours)
A. (Choose two)
Modern World Drama (ENG 208)
Shakespeare I (ENG 311)
Shakespeare II (ENG 312)
Aesthetics (PHIL 341)

Communication Arts with Public Relations Concentration (74-84 hours)

I. Communication Arts Core Requirements
(12 hours)

II. Concentration Requirements: (17-27 hours)
Newswriting (Eng 241)
Publicity, Media & Campaigns (CA 330)
Public Relations Research (CA 342)
Public Relations Case Studies (CA 430)
Internship (CA 335) (5 hrs. minimum)

III. Concentration Electives (Departmental)
(12 hours)
(Choose four)
Interviewing (CA 221)
Interpersonal Communication (CA 225)
Communication Theory (CA 230)
Radio Prog. & Prod. (CA 251)
TV Prog. & Prod. (CA 253)
Persuasive Speaking (CA 311)
Bus. & Prof. Speaking (CA 315)
Group Communication (CA 321)
Broadcast Journalism (CA 355)
Media Writing: Copywriting (CA 356)
Broadcast Media & Society (CA 453)

IV. Public Relations Cognates
A. English (Choose two)
Magazine Writing (Eng 243)
Press/Freedom/Law (Eng 244)
Journalism, Layout & Design (Eng 246)
Fiction Writing (Eng 342)
Persuasive Writing (Eng 343)

B. Social Sciences (Choose one)
Prin. of Behav. Mgt. (Psych 212)
Cultural Anthropology (Soc. 250)
Social Psychology (Psych 301)
Organizational Psychology (Psych 316)

C. Computer Science/Statistics
(Choose two)
Intro to Info. Proc. (CS 130)
PC Apps for Business (Bus 201)
Intro to Programming (CS 134)
Prob/Stats I (Math 142)
Prob/Stats II (Math 143)

D. Graphic Skills (Choose two)
Intro. to Communication Tech. (IT 240)
Advanced Graphic Comm. (IT 340)
Photography (IT 341)
Design I (Art 161)
Design II (Art 162)
Graphic Design I (Art 222)
Graphic Design II (Art 223)

E. Business Administration (Choose four)
Business Law I (Bus 322)
Prin. of Mgt. (Mgmt 330)
Marketing (Mrkt 351)
Management Org. Behavior (Mgmt 335)
Personal Selling (Mrkt 371)
Advertising (Mrkt 372)
Business & Society (Mgmt 410)

College General Education requirements may be used to satisfy some cognate courses.

Communication Arts with Broadcasting Concentration (45 hours)
I. Communication Arts Core Requirements (12 hours)

II. Concentration Requirements (15 hours)
Radio Prog. and Prod. (CA 251)
Television Prog. & Prod. (CA 253)
Media Writing (CA 356)
Broadcast Media and Society (CA 453)
Broadcasting Activities, 3 hrs. min (CA 252)

III. Concentration Electives (18 hours)
A. (Choose one)
Broadcast Management (CA 455)
Internship, 3 hrs. min. (CA 335)

B. (Choose two)
Broadcast Journalism (CA 355)
Broadcast Sales and Promotion (CA 452)
Advanced Radio/TV Production (CA 454)

C. (Choose Three)
Oral Interpretation (CA 160)
Interviewing (CA 221)
Interpersonal Communication (CA 225)
Acting (CA 260)
Business & Professional Spkg. (CA 315)
Voice and Diction (CA 340)
Cinema (CA 395)

Communication Arts with Musical Theatre Concentration (73 hours)
I. Communication Arts Core Requirements (12 hours)

II. Concentration Requirements (51 hours)
Acting (CA 260)
Performance Practicum (CA 261)
Musical Theatre Performance (CA 265)
Production Practicum (CA 276)
Theatre History II (CA 292)
Dance (10 hrs) selected from:
- Tap I (CA 115)
- Tap II (CA 215)
- Jazz Dance I (CA 116)
- Jazz Dance II (CA 216)
- Ballet I (CA 117)
- Ballet II (CA 217)
(all three dance types to be represented)
Music 100 or 110

III. Concentration Electives (10 hours)
A. Theatre Performance (choose 2)
- Acting (CA 260) (a 2nd course)
- Musical Th. Perf. (CA 265) (a 2nd course)
- Voice and Diction (CA 340)

B. Music Performance (need 4 hours)
- Chorus (MU 080)
- Chapel Choir (MU 081)
- Vocal Ensemble (MU 082)
- University Singers (MU 083)
- Chamber Chorale (MU 085)
- Opera Workshop (MU 089)

Communication Arts (without concentration)
I. Communication Arts Core Requirements (51 hours)

II. Additional Requirements (18 hours)
- Interpersonal Communication (CA 225)
- Communication Theory (CA 230)
- Oral Interpretation (CA 160)
- Argumentation (CA 121)
- Theatre Technology (CA 275)
- Acting (CA 260)

III. Electives (15 hours)
Any 15 hours from departmental offerings, selected in consultation with an advisor.

IV. Cognates (3 hours)
One advanced writing course (English Department)

Minors A general Communication Arts minor (30 hours) is available and consists of the following courses:
- Intro. to Theatre (CA 106)
- Argumentation (CA 121)
- Intro. to Public Relations (CA 130)
- Intro. to Broadcasting (CA 150)
- Public Speaking (CA 211)
- Interpersonal Communication (CA 225)
- Communication Theory (CA 230)
- Business & Prof. Speaking (CA 315)
- Media Writing (CA 356)
- Arts Management (CA 480)

Grading Any grade below "C" that is received in a departmental course will not count toward major and minor requirements.
Teacher Certification Certification in Speech and Communications (a combination of Speech, Theatre, English, Journalism, and Reading) is available through the department of communication arts.

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 coursework. The option is designed to provide a business focus for students within their communication career goals. The option consists of:

500-202 Principles of Microeconomics
500-231 Principles of Accounting I
500-232 Principles of Accounting II
500-233 Principles of Accounting III
500-322 Business Law I
500-330 Principles of Management
500-351 Marketing
500-362 Managerial Finance
500-363 Human Resource Management
500-371 Personal Selling

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

100 - SPEECH COMMUNICATION
3.00 Credit(s)
Group lectures which cover the basic concepts and practices of interpersonal, public, and group communication. Preparation, composition, and presentation of speeches. Basic knowledge of the process of communication in society. Laboratory experiences in the Communication Skills Center are available to the student.

105 - THEATRE APPRECIATION
3.00 Credit(s)
An introduction to the theatre experience as an art form through the study of its origin and development, and its contemporary theory and practice. Dramatic texts are examined through literature, film, and live theatre experiences. For the non-major. A terminal course which will not serve to answer any Communication Arts major sequences. May not be taken following a successful enrollment in COMM 106.

106 - INTRODUCTION TO THEATRE
3.00 Credit(s)
Introduction to dramatic structure and genres, production styles, and the roles of artists within the theatre. Overview of the history of theatre's place within society through the examination of selected dramatic texts. Primarily for majors.

115 - TAP DANCING 1
2.00 Credit(s)
An introduction to 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 for a total of six credits.

116 - JAZZ DANCE 1
2.00 Credit(s)
An introduction to 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 for a total of six credits.

117 - BALLET 1
2.00 Credit(s)
An introduction to 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 for a total of six credits.

121 - ARGUMENTATION
3.00 Credit(s)
Course focuses on basic skills in critical thinking by applying elementary debate theory through oral and written activities.

130 - INTRODUCTION TO PUBLIC RELATIONS
3.00 Credit(s)
Primarily a theory course describing the role, function, and responsibilities of the public relations practitioner within organizations.

150 - INTRODUCTION TO BROADCASTING
3.00 Credit(s)
A survey course that examines various aspects of broadcasting including mass communication, programming and electronic technology.
160 - ORAL INTERPRETATION
3.00 Credit(s)
Analysis and oral interpretation of the logical, emotional and aesthetic experience in poetry, prose, and dramatic dialogue, with emphasis on individual preparation and performance.

190 - SPECIAL TOPICS IN COMMUNICATION ARTS
1.00 to 3.00 Credit(s)

201 - SPEECH TEAM
1.00 to 3.00 Credit(s)
Extra-curricular individual events activities including participation in speech tournaments. Students can become involved in persuasive, informative, impromptu, and extemporaneous speaking, as well as the oral interpretation of prose and poetry. May be repeated for graduation credit by non-majors up to a maximum of 6 hours. Graded S-U.

202 - DEBATE TEAM
1.00 to 3.00 Credit(s)
Extra-curricular debate activities including participation in debate tournaments on topics of national interest. May be repeated for graduation credit by non-majors up to a maximum of 6 hours. Graded S-U.

203 - PUBLIC RELATIONS PRACTICUM
1.00 to 3.00 Credit(s)
Public relations practicum is designed to give students the opportunity to experience public relations first hand through professional involvement with service and non-profit projects.

211 - PUBLIC SPEAKING
3.00 Credit(s)
Extensive application of basic principles of oral communication in the composition and delivery of original speeches. Prerequisite: COMM 100.

215 - TAP DANCING 2
2.00 Credit(s)
A studio tap dance class for the intermediate and advanced student. May be repeated for a total of six credits. Permission of the instructor is required for admission.

216 - JAZZ DANCE 2
2.00 Credit(s)
A studio jazz dance class for the intermediate and advanced student. May be repeated for a total of six credits. Permission of the instructor required for admission.

217 - BALLET 2
2.00 Credit(s)
A studio ballet class for the intermediate and advanced student. At the discretion of the instructor, this class may include pointe work and partnering work for students with strong technique. May be repeated for a total of six credits. Permission of the instructor required for admission.

221 - INTERVIEWING
3.00 Credit(s)
The basic principles and structures of interviewing are examined and applied to employment, journalistic, persuasive, survey, counseling, and performance/appraisal interview types.

223 - ORGANIZATIONAL COMMUNICATION
3.00 Credit(s)
A course designed to introduce students to the functions, patterns, and problems of communication in organizations. Course also covers techniques for improving organizational communication/management.

225 - INTERPERSONAL COMMUNICATION
3.00 Credit(s)
Analysis of dimensions in interpersonal relationships such as needs, perceptions, orientations, contexts, and barriers to intimacy. Course is oriented around exercises, demonstrations, and applications of the transactional analysis model to students' own experiences.

230 - COMMUNICATION THEORY
3.00 Credit(s)
Prerequisite(s): COMM-100
The course is designed to provide a framework of knowledge about the theories, nature, and dynamics of human communication/interaction. Prerequisite: COMM 100.

240 - PARLIAMENTARY PROCEDURE
3.00 Credit(s)
Methods of conducting formal meetings by parliamentary rules.

251 - RADIO PROGRAMMING AND PRODUCTION
3.00 Credit(s)
To acquaint students with operational procedures of commercial/noncommercial radio stations. Participation in radio performance, production, and writing techniques. Practice in performance skills offered via required labs and provided through production facilities at WONB-FM. Prerequisite: COMM 150.
252 - BROADCASTING ACTIVITIES
1.00 to 3.00 Credit(s)
Broadcasting practicum involving, but not limited to, announcing, traffic, management, scheduling, programming, writing, etc. May be repeated for graduation credit by non-majors up to a maximum of 6 hours. Prerequisite: Permission of department.

253 - TELEVISION PROGRAMMING AND PRODUCTION
3.00 Credit(s)
To acquaint students with operational procedures of commercial/non-commercial television stations. Participation in television performance, production, and writing techniques. Practice in performance skills offered via required labs and provided through University production facilities. Prerequisite: COMM 150.

260 - ACTING
3.00 Credit(s)
A studio class designed to introduce and develop fundamental acting skills through readings, discussions, exercises, monologues, and scenes. Course may be repeated for a maximum of 6 hours by non-majors for graduation credit and for a maximum of 9 hours by majors for graduation credit.

261 - PERFORMANCE PRACTICUM
1.00 to 3.00 Credit(s)
Open only to those students who have auditioned for and have been awarded roles in University Theatre or Studio Theatre productions. 1-3 hours credit depending on role. May be repeated by non-majors for graduation credit up to a maximum of 6 hours. Prerequisite: Permission of director.

265 - MUSICAL THEATRE PERFORMANCE
3.00 Credit(s)
A study of performance techniques for musical theatre. Preparation of scenes and songs from musicals. Prerequisite: Musical Theatre major or permission of instructor.

275 - THEATRE TECHNOLOGY
3.00 Credit(s)
Introduction to 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.

276 - PRODUCTION PRACTICUM
1.00 to 3.00 Credit(s)
Participation in technical/production aspects of University and/or Studio Theatre productions. A maximum of 6 hours may be taken by non-majors for graduation credit.

278 - MAKEUP
3.00 Credit(s)
Methods and practice in the creation and application of stage makeup. Students may comprise makeup crews for University Theatre and Studio Theatre productions.

285 - STAGE MANAGEMENT
3.00 Credit(s)
A study of the 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.

290 - SPECIAL TOPICS IN COMMUNICATION ARTS
1.00 to 3.00 Credit(s)

291 - THEATRE HISTORY 1
3.00 Credit(s)
History and social impact of the theatre from ancient times to 1800.

292 - THEATRE HISTORY 2
3.00 Credit(s)
History and social impact of the theatre from 1800 to the present.

311 - PERSUASIVE SPEAKING
3.00 Credit(s)
Understanding and applying theories and techniques of persuasion through audience analysis, and the preparation and delivery of persuasive speeches. Prerequisite: COMM 100.

315 - BUSINESS AND PROFESSIONAL SPEAKING
3.00 Credit(s)
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 100.

321 - GROUP COMMUNICATION
3.00 Credit(s)
Combines group theory and problem solving through a discussion format. Students focus on the process from analyzing a problem to implementing a solution. Prerequisite: COMM 100.
330 - PUBLICITY, MEDIA, AND CAMPAIGNS
3.00 Credit(s)
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.

335 - INTERNSHIP
1.00 to 15.00 Credit(s)
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. One to 15 hours credit toward graduation for the major.

340 - VOICE AND DICTION
3.00 Credit(s)
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.

342 - PUBLIC RELATIONS RESEARCH FOR PLANNING AND EVALUATION
3.00 Credit(s)
A course designed to study the planning and evaluation process of public relations programs. It will emphasize the difference between public relations research and social science research methodologies by examining social groupings with whom messages are to be exchanged, ascertaining the impact of the action and information system on communication participants and the evaluation of the results. Prerequisite: COMM 130.

350 - SPEECH/THEATRE METHODS
3.00 Credit(s)
Investigation, survey, readings, methods, and application of teaching techniques in speech, communication, broadcasting, and theatre. Required of all majors seeking teacher certification. Includes approximately 30 hours of field experience. Prerequisite: Acceptance into teacher education program or permission of the instructor.

355 - BROADCAST JOURNALISM
3.00 Credit(s)
An examination of the 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.

356 - MEDIA WRITING
3.00 Credit(s)
A study of the principles and techniques of copywriting for Radio and Television, copywriting for Public Relations, playwriting for Theatre. May be repeated up to 3 times as subject matter rotates between each area of concentration annually. Prerequisites: COMM 106, 130 and 150.

361 - READERS THEATRE
3.00 Credit(s)
Group performance in the dramatic interpretation of the novel, short story, drama, and poetic forms of literature.

375 - SCENE DESIGN
3.00 Credit(s)
Methods and practice in the art of scenography via University Theatre and/or Studio Theatre productions.

376 - LIGHTING DESIGN
3.00 Credit(s)
Methods and practice in the art of lighting design application via University Theatre and/or Studio Theatre productions.

377 - COSTUME DESIGN
3.00 Credit(s)
Methods and practice in costume design and construction via University Theatre and/or Studio Theatre productions.

378 - DESIGN PRACTICUM
3.00 Credit(s)
The actual design, supervision, and execution of lights, sets, costumes, sound, or props for a main stage or studio production. The student is assigned a departmental advisor for the project. Course may be repeated for maximum of 6 hours by non-majors for graduation credit, and for a maximum of 9 hours by majors for graduation credit. Prerequisites: COMM 375, 376 or 377 and/or permission of the department.

385 - PRODUCTION ANALYSIS
3.00 Credit(s)
The course explores the techniques for the interpretation of dramatic literature for staging by the producer, director, and designers. Content includes the basic concepts of interpretation, theme, style, play analysis, and staging.

386 - DIRECTING
3.00 Credit(s)
Methods, theories, exercises, and practices in directing and presenting dramatic scenes. Prerequisite: 3 hours of acting and permission of the instructor.
387 - DIRECTING PRACTICUM
3.00 Credit(s)
The actual directing of a main stage or studio production. The student is assigned a departmental advisor for the project. Course may be repeated for a maximum of 6 hours by non-majors for graduation credit, and for a maximum of 9 hours by majors for graduation credit. Prerequisite: COMM 386 and permission of the instructor.

390 - SPECIAL TOPICS IN COMMUNICATION ARTS
1.00 to 3.00 Credit(s)

395 - CINEMA
3.00 Credit(s)
An examination of the development of contemporary cinema focusing on influential directors, producers, major critics, and the business of marketing a film.

430 - PUBLIC RELATIONS CASE STUDIES
3.00 Credit(s)
An examination of public relations case studies concerning problems in industry, business, education, government, social welfare and trade associations. Prerequisite: COMM 130.

452 - BROADCAST SALES AND PROMOTIONS
3.00 Credit(s)
Introduction to the skills involved in selling broadcast time and station promotion. To be offered once every three years for majors. Prerequisite: COMM 150.

453 - BROADCAST MEDIA AND SOCIETY
3.00 Credit(s)
The legal, ethical, and social responsibilities of journalists and other mass communicators. Prerequisite: COMM 150.

454 - ADVANCED RADIO/TELEVISION PRODUCTION
3.00 Credit(s)
Advanced training on an individualized basis in the production areas of radio and/or television. Prerequisites: COMM 251 or 253.

455 - BROADCAST MANAGEMENT
3.00 Credit(s)
A study of sales, programming, marketing, and management techniques unique to the broadcast medium. Prerequisite: COMM 150.

480 - ARTS MANAGEMENT
3.00 Credit(s)
Explores the management of commercial and non-commercial arts organizations. Content includes philosophy, finances, operations, and promotion.

490 - SPECIAL TOPICS IN COMMUNICATION ARTS
1.00 to 3.00 Credit(s)

499 - INDEPENDENT STUDY IN COMMUNICATION ARTS
1.00 to 3.00 Credit(s)
Prerequisite: Permission of department.
DEPARTMENT OF EDUCATION

(Department 141)

Subject - Education (EDUC)

Professors Haynes (Director, CTEC), Miller; Associate Professor Griggs (Interim Chair); Assistant Professors Crosier, Freeman; Visiting Assistant Professor Berg; Lecturers McCullough, Osborn.

The professional education unit at Ohio Northern University is the Center for Teacher Education and Certification. 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 and certification 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 certificates 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 and Certification.

PLEASE NOTE: All general education, curriculum area, professional education, and admission to teacher education program 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 experiences is available in the office of the Center for Teacher Education and Certification 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 and Certification.

Elementary Education (1-8) Certification
General education, curriculum area, and concentration area requirements may be obtained in the office of the Center for Teacher Education and Certification. The courses in general education and curriculum area will meet College of Arts and Sciences and state-approved program requirements.

A concentration of 30 quarter hours must be completed in one of the following disciplines: art/music, biology, English, French, history, mathematics, social studies, psychology/sociology, Spanish. Specific course requirements in each area may be obtained in the office of the Center for Teacher Education and Certification.

Professional education course requirements are:
Ed. 110: Introduction to Education, 4 hours
Ed. 150: Five-Day Field Experience, 1 hour (taken twice)
Ed. 195: Orientation, 1 hour
Ed. 225: Child and Adolescent Psychology, 4 hours
Ed. 245: Children's Literature, 3 hours
Ed. 263: Educational Psychology, 4 hours
Ed. 285: Curriculum, 4 hours
Ed. 306: Teaching Social Studies & Science in the Elementary School, 4 hours
Ed. 308: Teaching Math in the Elementary School, 4 hours
Ed. 312: Teaching Reading I, 4 hours
Ed. 314: Teaching Reading II, 4 hours
Ed. 470: Student Teaching, 14 hours
Ed. 475: Student Teaching Seminar, 1 hour

Elementary Education with Kindergarten-Primary (K-8) Certification: completion of the elementary education program, plus:
Ed. 240: Introduction to Early Childhood Education, 3 hours
Ed. 241: Methods and Materials in Early Childhood Education, 3 hours
Ed. 242: Early Childhood Practicum, 3 hours

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

Elementary Education with Specific Learning Disabled Certification (K-12): completion of the elementary education program, plus:
Ed. 210 Education of Exceptional Children, 4 hours
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
Industrial Technology
Mathematics
Physical Education
Physics
Political Science
Psychology/Sociology
Sales
Science Comprehensive
Social Studies Comprehensive
Speech/Communication

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

Secondary Education Certification with Driver Education Endorsement: completion of requirements in a specific teaching field, plus:
HPE 219: Psychological Factors in Driving, 3 hours
HPE 433: Driver Education, 3 hours
HPE 434: Organization and Administration of Drivers-Traffic Safety, 3 hours

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

Professional education requirements are:
Ed. 110: Introduction to Education, 4 hours
Ed. 150: Five-Day Field Experience, 1 hour (taken twice)
Ed. 225: Child and Adolescent Psychology, 4 hours
Ed. 263: Educational Psychology, 4 hours
Ed. 285: Curriculum, 4 hours
Ed. 342: Reading in the Content Area, 4 hours
Ed. 412: Secondary School Instructional Strategies, 2 hours
PLUS Methods in Specific Teaching Field, 4 hours
Ed. 475: Student Teaching Seminar, 1 hour
Ed. 480: Student Teaching, 14 hours

Specific methods courses:
English 450, 4 hours
Industrial Technology 473, 4 hours
Mathematics 454, 4 hours
Physical Education 351, 4 hours
Secondary Science 451, 5 hours
Social Studies 450, 4 hours

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

Secondary Education (7-12) Certification
Requirements for certification in the various secondary teaching fields may be obtained in the office of the Center for Teacher Education and Certification. Additionally, all students seeking Secondary and All-Grades Certification must complete a minimum three-hour computer science course and a minimum three-hour mathematics course.

Professional education requirements are:
Ed. 110: Introduction to Education, 4 hours
Ed. 150: Five-Day Field Experience, 1 hour (taken twice)
Ed. 225: Child and Adolescent Psychology, 4 hours
Ed. 263: Educational Psychology, 4 hours
Ed. 285: Curriculum, 4 hours
Ed. 342: Reading in the Content Area, 4 hours
Ed. 412: Secondary School Instructional Strategies, 2 hours
PLUS Methods in Specific Teaching Field, 4 hours
Ed. 475: Student Teaching Seminar, 1 hour
Ed. 480: Student Teaching, 14 hours

Specific methods courses:
English 450, 4 hours
Industrial Technology 473, 4 hours
Mathematics 454, 4 hours
Physical Education 351, 4 hours
Secondary Science 451, 5 hours
Social Studies 450, 4 hours
Ed. 450: K-12 Methods, 4 hours
PLUS
Methods in Specific Teaching Field, 4 hours
Ed. 470: Student Teaching, 7 hours
Ed. 475: Student Teaching Seminar, 1 hour
Ed. 480: Student Teaching, 7 hours

Specific methods courses:
Art 457, 4 hours
Foreign Language 380, 4 hours
Health 350, 4 hours
Industrial Technology 473, 4 hours
Music 361, 461 and 462, 3 hours each
Physical Education 351, 4 hours

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

All Grades Certification with Reading (K-12)
Endorsement: completion of requirements in a specific teaching field, plus:
Ed. 312: Teaching Reading I, 4 hours
Ed. 314: Teaching Reading II, 4 hours
Ed. 340: Diagnosis and Correction of Reading Difficulties, 3 hours
Ed. 341: Advanced Reading Methods and Materials - Clinical Practice in Remedial Reading, 3 hours

All Grades Certification with Driver Education
Endorsement: completion of requirements in a specific teaching field
PLUS
HPE 219: Psychological Factors in Driving, 3 hours
HPE 433: Driver Education, 3 hours
HPE 434: Organization and Administration of Drivers-Traffic Safety, 3 hours

150 - FIVE-DAY FIELD EXPERIENCE
1.00 Credit(s)
Observation and participation with students and teachers in a public school setting for five consecutive school days - 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 certification. Approval of education advisor is required prior to this experience. Graded S-U. Prerequisite: EDUC 110.

190 - SPECIAL TOPICS IN EDUCATION
1.00 to 3.00 Credit(s)

195 - ORIENTATION
1.00 Credit(s)
Familiarization with the department, requirements for majors, planning program of courses and field-based experiences, University catalog, and library. Required of elementary education majors.

200 - CHILD DEVELOPMENT PRACTICUM
1.00 Credit(s)
Assignment as a regular assistant in the Child Development Center. Registration with permission of the department chairperson.

210 - INTRODUCTION TO SPECIAL EDUCATION
4.00 Credit(s)
A course for education and non-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. Includes a minimum of 30 hours of field experience. Prerequisite: EDUC 110.

225 - CHILD AND ADOLESCENT PSYCHOLOGY
4.00 Credit(s)
Characteristics of the child and adolescent at different levels of maturity; physical, mental, social and emotional growth; growth and organization of meanings and concepts; controls and factors included in social behavior; personality development. Includes a minimum of 30 hours of field experience. Prerequisites: Students seeking teacher certification: PSYC 100 with a grade of "C" or better; all others PSYC 100.

240 - INTRODUCTION TO EARLY CHILDHOOD EDUCATION
3.00 Credit(s)
History, philosophy and current developments in the field of early childhood education. Discussion of Montessori, Piaget, Headstart, Day Care,
Nursery School, and Kindergarten Education. Introduction to the field of early childhood education. Prerequisites: EDUC 110 and PSYC 100.

241 - METHODS & MATERIALS IN EARLY CHILDHOOD EDUCATION
3.00 Credit(s)
Curriculum planning and organization, teaching processes, development of materials for early childhood settings. Prerequisite: EDUC 240.

242 - EARLY CHILDHOOD PRACTICUM
3.00 Credit(s)
Sixty hours of field experience in an early childhood setting, plus seminars. One credit hour equals 30 hours of field experience. Prerequisites: EDUC 240 and 241.

245 - CHILDREN'S LITERATURE
3.00 Credit(s)
Knowledge and appreciation of children's books and teaching of creative writing skills. Emphasis will be placed on the study of all areas of literature for children, including realism, fantasy, folk literature, poetry, biography and informational books.

263 - EDUCATIONAL PSYCHOLOGY
4.00 Credit(s)
The learner, the learning process, and conditions that promote learning. Application of psychological principles to teaching in the classroom. Includes a minimum of 30 hours of clinical experience. Prerequisite: PSYC 100 with a grade of "C" or better.

285 - CURRICULUM
4.00 Credit(s)
School curriculum practices, instructional materials, curriculum development changes and trends. Discussion of mainstreaming and gifted education. Designed for elementary, secondary and all-grades education majors. Includes 30 hours of clinical experience.

290 - SPECIAL TOPICS IN EDUCATION
1.00 to 3.00 Credit(s)

306 - TEACHING SOCIAL STUDIES AND SCIENCE IN ELEMENTARY SCHOOL
4.00 Credit(s)
Objectives, trends, issues, and evaluation of the teaching of social studies and science in the elementary school. Includes preparation of units and organization of learning activities for problem solving. Includes a minimum of 30 hours of field experience. Prerequisite: Admission to Teacher Education.

308 - TEACHING MATHEMATICS IN THE ELEMENTARY SCHOOL
4.00 Credit(s)
Content, strategies, materials, and evaluation that reflect the current emphasis in mathematics. Includes 30 hours of field experience. Prerequisite: Admission to Teacher Education.

312 - TEACHING READING 1
4.00 Credit(s)
Introduction to reading. Emphasis will be placed on how to teach phonics, whole language, emerging literacy, word recognition skills, cooperative learning and communication skills including handwriting, listening, speaking, spelling, grammar and usage. Includes 30 hours of field experience. Prerequisite: Admission to Teacher Education.

314 - TEACHING READING 2
4.00 Credit(s)
Principles and methods of teaching reading including whole language, phonics, creative writing, comprehension skills, diagnostic skills and preparation and evaluation of reading materials. Includes 30 hours of field experience. Prerequisites: EDUC 312 and admission to Teacher Education.

315 - EDUCATION OF CHILDREN WITH LEARNING DISABILITIES
4.00 Credit(s)
The study of the meaning and concepts associated with the field of learning disabilities and the history, definitions, theories, issues, instructional strategies delivery systems and trends in the field. Includes approximately 30 hours of field experience. Prerequisites: EDUC 110 and 210.

340 - DIAGNOSIS AND CORRECTION OF READING DIFFICULTIES
3.00 Credit(s)
A study of reading difficulties and related causal factors. Investigation and utilization of diagnostic procedures and techniques, including experience in administration and interpretation. Appropriate teaching procedures for remedial reading will be studied. Prerequisites: EDUC 312, 314, and admission to Teacher Education.

341 - ADVANCED READING METHODS AND MATERIALS-CLINICAL
3.00 Credit(s)
Intensive study and discussion of specific areas of interest in reading and practical application of diagnostic techniques and procedures in a clinical field experience situation. Thirty hours of field experience are included. Prerequisites: EDUC 312, 314 and 340 and admission to Teacher Education.
342 - READING IN THE CONTENT AREA:
SECONDARY EDUCATION
4.00 Credit(s)
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 field experience. Prerequisite: Admission to Teacher Education.

350 - DEPARTMENTAL FIELD EXPERIENCE
1.00 Credit(s)
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 students seeking secondary or all-grades certification if 300 hours of field experience is not complete in other professional education courses. Graded S-U. May be repeated once for a total of two hours credit.

365 - CLASSROOM MANAGEMENT OF THE EXCEPTIONAL LEARNER
4.00 Credit(s)
Principles and techniques of behavior shaping are related to classroom structure, managing development of academic skills, and measurement of behavior change. Alternative approaches of behavior management are compared. Principles and approaches will be applied to the challenges of the learning disabled student through class lectures and field experience. Prerequisite: EDUC 210.

390 - SPECIAL TOPICS IN EDUCATION
1.00 to 3.00 Credit(s)

412 - SECONDARY SCHOOL INSTRUCTIONAL STRATEGIES
2.00 Credit(s)
Strategies for planning, implementing, managing, and evaluating instruction for the secondary school. Focuses on the implications of the social, cognitive, physical, and moral development of secondary students for instruction. Includes 30 hours of field experience. NOTE: EDUC 412 does not fulfill the methodology requirement for elementary or all grades education majors. EDUC 412 may be taken concurrently with the specialty course in methodology. Prerequisite: Admission to Teacher Education.

420 - SPECIFIC LEARNING DISABLED: EDUC/Psych Develop Handicapped
3.00 Credit(s)
Course is provided by arrangement with the University of Findlay, Fall Quarter, at Findlay. Students will register at ONU Fall Quarter of their junior year. Introduction to the understanding and teaching of developmentally handicapped children: etiology, diagnosis, theory and education procedure.

421 - SPECIFIC LEARNING DISABLED: DIAGNOSTIC ASSESSMENT/TEACHING TECHNIQUES
6.00 Credit(s)
Course provided by arrangement with the University of Findlay Fall Quarter at Findlay. Students will register Fall Quarter at ONU of their senior year. To examine the instruments and procedures the special education teacher uses in diagnostic process, and the development of prescriptions from diagnostic information for specific learning disability and developmentally handicapped children.

422 - SPECIFIC LEARNING DISABLED: READING/LANGUAGE ARTS METHODS
6.00 Credit(s)
Course is provided by arrangement with the University of Findlay Spring Quarter at Findlay. Students will register Winter Quarter of their junior year. Emphasis on the functional use of oral and written communication skills in conjunction with language arts and skills and on practical applications to everyday living experiences.

423 - COUNSELING PARENTS OF HANDICAPPED/STUDENT TEACHING
12.00 Credit(s)
Courses provided by arrangement with the University of Findlay Spring Quarter at Findlay. Students will register for Winter Quarter at ONU of their senior year. This course is designed to expose the prospective teacher of handicapped students to the purpose, principles and conditions of parent counseling. Both counseling theory and application are used as a basis of the course. Planning and teaching under supervision in a Specific Learning Disabled classroom.

450 - K-12 METHODS
4.00 Credit(s)
Strategies for planning, implementing, managing, and evaluating instruction across the K-12 curriculum. Focuses on the cognitive, social, physical, and moral development of K-12 students and the implications for instruction. Includes 30 hours
of field experience. NOTE: EDUC 450 does not fulfill the methodology requirement for secondary education majors (7-12). Prerequisite: Admission to Teacher Education.

451 - SECONDARY SCIENCE METHODS
5.00 Credit(s)
Methods, strategies and safety considerations for classroom and laboratory instruction in secondary school science. Topics include laboratory planning, laboratory management, laboratory safety, science-technology-society, computer-assisted instruction, materials procurement and materials storage. Thirty hours field experience required. Prerequisite: Admission to Teacher Education.

454 - METHODS IN TEACHING SECONDARY SCHOOL MATHEMATICS
4.00 Credit(s)
Methods and current issues in secondary 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. The class includes 30 hours of field experience. Prerequisite: Admission to Teacher Education or permission of Director of Teacher Education. Co-requisite: EDUC 412.

470 - STUDENT TEACHING IN THE ELEMENTARY SCHOOL
7.00 or 14.00 Credit(s)
Planning and teaching under supervision in the elementary grades; weekly seminar on campus. Prerequisites: An overall accumulative point average of 2.5 with no grade less than “C” in education or major courses required for certification; a minimum of 300 hours of supervised clinical/field experiences; recommendation of the major department advisor and chairperson, professional education advisor, and the Director of Teacher Education. Students seeking all grades (K-12) certification enroll for 7 hours. Students seeking elementary (K-8 or 1-8) certification enroll for 14 hours. Co-requisite: EDUC 475.

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

480 - STUDENT TEACHING-JUNIOR AND SENIOR HIGH SCHOOL
7.00 or 14.00 Credit(s)
Planning and teaching under supervision in the junior or senior high school, full time, five days per week, in the major teaching field of the student; weekly seminar on campus. Prerequisite: An overall accumulative point average of 2.5 with no grade less than “C” in education or major courses required for certification; 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 all grades (K-12) certification enroll for 7 hours. Students seeking elementary (K-8 or 1-8) certification enroll for 14 hours. Co-requisite: EDUC 475.

490 - SPECIAL TOPICS IN EDUCATION
1.00 to 3.00 Credit(s)

497 - INDEPENDENT STUDY IN EDUCATION
1.00 to 3.00 Credit(s)
In areas of student interest with permission of department chairperson.
All English majors and minors must take a specified number of courses from the following core distribution of literature courses: Medieval/Renaissance Literature Restoration/Eighteenth-Century/Romantic Literature Victorian/Twentieth-Century British Literature Pre-Twentieth Century American Literature Twentieth-Century American Literature World Literature/Critical Theory

The major in English/Literature (45 hours) requires the following courses: 311 or 312, 351, 384, 410, 483, 484, 485, five courses in five of the core distribution areas, and two English electives. Also required is Foreign Language 215, 235, 245, 251 or 266, or three philosophy courses above the 100 level.

A major in English/Writing (48 hours) requires the following courses: 250 (taken 3 times), 351, 384, 483, 484, 485, three journalism and/or upper-level writing courses and six courses from five of the core distribution areas.

A major in English for Secondary School Education Certification (49 hours) requires the following courses: 225, 311 or 312, 343 or 347, 351, 384, 410, 450, 483, 484, 485, and five courses in five of the core distribution areas.

All English majors must take at least half of their required courses in English (excluding general education English courses) at the 300 or 400 level.

Before graduation, English majors must demonstrate proficiency on the word processor in order to meet the college requirement for computer literacy.

The minor in Literature (32 hours) requires the following courses: 311 or 312, 351, five courses in five of the core distribution areas, and one elective in literature or writing.

The minor in Writing (31-32 hours) requires the following courses: 250 taken 3 times or an elective in upper-level writing, 351, two journalism and/or upper-level writing courses, and four courses in five of the core distribution areas.

English 110, 111, 204 do not count toward any major or minor in the Department of English, nor does any course with a grade below "C."

Business Option for English Majors

A student wishing an option in business with a major in English must complete a 30-hour program in the College of Business Administration: Accounting 231, 232, 233, Mathematics 142, Business 322, Economics 202, 203, Management 330, Marketing 351, Finance 362.
001 - ENRICHMENT
.00 Credit(s)
Enrichment of the curriculum for English majors through compulsory attendance at designated cultural and academic extracurricular events. Must be taken twice each academic year by all English majors.

110 - WRITING 1
3.00 Credit(s)
Beginning writing. Emphasis throughout the course on the development of writing skills, based on the principles of critical thinking. Prerequisite for all 200 level courses except for students specifically exempted from the course.

111 - WRITING 2
3.00 Credit(s)
Continuation of ENGL 110. Prerequisite for ENGL 204.

151 - ENGLISH AS A SECOND LANGUAGE
3.00 Credit(s)
Communication skills for non-native speakers of English with emphasis on reading and writing in a cultural context. ENGL 151 may be substituted for ENGL 110.

152 - ENGLISH AS A SECOND LANGUAGE
3.00 Credit(s)
Continuation of ENGL 151. ENGL 152 and 153 together may be substituted for ENGL 111.

153 - ENGLISH AS A SECOND LANGUAGE
3.00 Credit(s)
Continuation of ENGL 152. ENGL 152 and 153 together may be substituted for ENGL 111. Prerequisites: ENGL 151 or 110 and 152.

190 - SPECIAL TOPICS IN ENGLISH
1.00 to 3.00 Credit(s)

195 - PROSEMINAR IN ENGLISH
1.00 Credit(s)
Orientation to the College of Arts and Sciences and to the Department of English. Required of all freshmen and transfer majors in the fall quarter. Counts as Arts and Sciences orientation requirement.

201 - BRITISH LITERATURE TO 1660
4.00 Credit(s)
A survey of Anglo-Saxon, Medieval, and Renaissance literature.

202 - BRITISH LITERATURE 1660-1830
4.00 Credit(s)
A survey of Restoration, Neo-Classic, and Romantic literature.

203 - BRITISH LITERATURE AFTER 1830
4.00 Credit(s)
A survey of Victorian and Modern literature.

204 - GREAT WORKS
3.00 Credit(s)
A study in depth of a small number of important literary texts. Not open to Freshmen.

207 - MODERN POETRY
4.00 Credit(s)
A study of modern English and American poets with emphasis on one or two major figures such as Yeats and Frost.

208 - MODERN WORLD DRAMA
4.00 Credit(s)
A study of modern drama, concentrating on major works and playwrights, including influences, movements and types.

209 - MODERN FICTION
4.00 Credit(s)
A study of selected works of modern fiction, including influences, movements and types.

211 - AMERICAN LITERATURE TO 1865
4.00 Credit(s)
A survey of Colonial and Romantic literature.

212 - AMERICAN LITERATURE AFTER 1865
4.00 Credit(s)
A survey of Modern literature.

221 - WORLD LITERATURE 1
4.00 Credit(s)
Major literary masterpieces of the ancient and medieval periods.

222 - WORLD LITERATURE 2
4.00 Credit(s)
Major literary masterpieces from the Renaissance to the mid-nineteenth century.

223 - WORLD LITERATURE 3
4.00 Credit(s)
Major literary masterpieces from the mid-nineteenth century to the present.

225 - APPROACHES TO CHILDREN'S LITERATURE
4.00 Credit(s)
Knowledge and appreciation of 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 only to majors in English and elementary education.
241 - NEWSWRITING 1
4.00 Credit(s)
The fundamentals of gathering information and writing for a newspaper. Prerequisites: ENGL 110 and 111.

242 - NEWSWRITING 2
4.00 Credit(s)
An advanced course in gathering information and writing for a newspaper. Prerequisites: ENGL 110, 111 and 241.

243 - MAGAZINE WRITING
4.00 Credit(s)
The discipline and technique of writing articles for magazines. Prerequisite: ENGL 111.

244 - PRESS/FREEDOM-LAW
4.00 Credit(s)
A survey of press freedom and law in the United States, including recent developments within the collegiate press.

246 - JOURNALISM LAYOUT AND DESIGN
4.00 Credit(s)
The theory and technique of layout and design of newspapers and magazines.

Journalism activities involve supervised work on and contributions to publications. A student may enroll for only one activities course per quarter. Six hours in one area or a combination of six hours from four areas (250, 251, 252, 253) may be counted toward graduation, but only the required three credit hours of Journalism Activities—Newspaper (250) may be counted toward a major in English/Writing or towards a minor in writing. Journalism activities do NOT count toward a major in English/Literature or toward a minor in Literature. No prerequisites.

250 - JOURNALISM ACTIVITIES-NEWSPAPER
1.00 Credit(s)

251 - JOURNALISM ACTIVITIES-MAGAZINE
1.00 Credit(s)

252 - JOURNALISM ACTIVITIES-YEARBOOK
1.00 Credit(s)

253 - JOURNALISM ACTIVITIES—INTERNSHIP
1.00 Credit(s)
Supervised work on and contributions to the publications.

254 - JOURNALISM ACTIVITIES-HIGH SCHOOL PUBLICATIONS
1.00 Credit(s)
Students work on high school publications in an area high school under the supervision of a high school teacher and a faculty member of the English Department. Prerequisites: ENGL 110, and either ENGL 241, 244 or 246.

290 - SPECIAL TOPICS IN ENGLISH
1.00 to 4.00 Credit(s)
Prerequisite: ENGL 110.

291 - SPECIAL TOPICS IN WORLD LITERATURE
1.00 to 4.00 Credit(s)
Prerequisite: ENGL 110.

292 - SPECIAL TOPICS IN BRITISH LITERATURE
1.00 to 4.00 Credit(s)
Prerequisite: ENGL 110.

293 - SPECIAL TOPICS IN AMERICAN LITERATURE
1.00 to 4.00 Credit(s)
Prerequisite: ENGL 110.

297 - INDEPENDENT STUDY IN ENGLISH
1.00 to 3.00 Credit(s)

310 - BRITISH LITERATURE BEFORE 1500
4.00 Credit(s)
A study of the epic, lyric poetry and drama forming the background for later English literature: "Beowulf," the King Arthur tales, Irish and Welsh poetry and myths, the romance, and early forms of drama. Prerequisite: 200-level course.

311 - SHAKESPEARE 1
4.00 Credit(s)
Representative plays and poems. Prerequisite: 200-level course.

312 - SHAKESPEARE 2
4.00 Credit(s)
Representative plays and poems not covered in 311. May be taken separately from ENGL 311. Prerequisite: 200-level course.

319 - RENAISSANCE LITERATURE
4.00 Credit(s)
A concentrated study of two or three major writers, movements, or genres of the period 1485-1660. Shakespeare is generally excluded. Prerequisite: Course at 200 level.
322 - RESTORATION AND THE EIGHTEENTH CENTURY
4.00 Credit(s)
A concentrated study of two or three major writers, movements, or genres in the Neo-Classic period. Prerequisite: 200-level course.

323 - BRITISH ROMANTICISM
4.00 Credit(s)
A concentrated study of two or three major writers. Prerequisite: 200-level course.

324 - VICTORIAN PERIOD
4.00 Credit(s)
A concentrated study of two or three major writers, movements, or genres. Prerequisite: 200-level course.

326 - TWENTIETH-CENTURY BRITISH LITERATURE
4.00 Credit(s)
A concentrated study of two or three major writers, movements, or genres. Prerequisite: 200-level course.

334 - MAJOR AMERICAN WRITERS OF THE NINETEENTH CENTURY
4.00 Credit(s)
A concentrated study of selected nineteenth-century writers. Prerequisite: 200-level course.

335 - MAJOR AMERICAN WRITERS OF THE TWENTIETH CENTURY
4.00 Credit(s)
A concentrated study of selected twentieth-century writers. Prerequisite: 200-level course.

341 - POETRY WRITING
4.00 Credit(s)
The discipline and technique of writing poetry. Graded S-U. May be continued as ENGL 498 (independent study in writing). Prerequisite: 200-level literature course.

342 - FICTION WRITING
4.00 Credit(s)
The discipline and technique of writing fiction. Graded S-U. May be continued as ENGL 498 (independent study in writing). Prerequisite: 200-level literature course.

343 - PERSUASIVE WRITING
4.00 Credit(s)
An advanced writing course stressing the art of persuasive prose in letters, reports and critiques. Prerequisite: 200-level course.

346 - PRELAW WRITING
4.00 Credit(s)
Clear analysis and direct communication of facts and ideas according to the mode of legal writing. Prerequisite: 200-level course.

347 - ADVANCEDWRITING
4.00 Credit(s)
An advanced writing course tailored to fit the specific needs of students in various disciplines, including scholarly research, business letters, scientific reports, abstracts, memoranda and writing for the general public. Prerequisite: 200-level course.

351 - THE ENGLISH LANGUAGE
4.00 Credit(s)
An introduction to the study of linguistics with the emphasis on a description of the structure of English grammar. Prerequisite: 200-level course.

364 - THE BRITISH NOVEL
4.00 Credit(s)
Representative novels from the eighteenth century to the present. Prerequisite: 200-level course.

365 - THE AMERICAN NOVEL
4.00 Credit(s)
Representative novels from the nineteenth century to the present. Prerequisite: 200-level course.

370 - AFRICAN LITERATURE
4.00 Credit(s)
Novels and short stories that reflect African imagination, mentality and ethnic life in colonial and post-independence periods. This course satisfies the general education requirement for non-Western culture. Prerequisite: 200-level course.

381 - LITERARY CRITICISM
3.00 Credit(s)
A study of major theories and their practical applications. Prerequisite: 200-level course.

384 - DIRECTED READING
1.00 to 4.00 Credit(s)
Independent reading and tutorial under the supervision of an instructor. Open only to juniors who are English majors or minors. Prerequisite: 300-level course.

390 - SPECIAL TOPICS IN ENGLISH
1.00 to 4.00 Credit(s)
410 - CHAUCER
4.00 Credit(s)
A study of Chaucer with special emphasis on "The Canterbury Tales," some reading of the chief literary forms of the Middle Ages, some skill in understanding and reading Middle English. Prerequisite: 200-level course.

450 - METHODS OF TEACHING ENGLISH IN THE SECONDARY SCHOOL
4.00 Credit(s)
Effective methods of teaching grammar, writing, and literature at the high school level. Includes approximately 30 hours of field experience. Prerequisites: EDUC 110, 150, 151 and 225.

481 - INTERNSHIP
1.00 to 15.00 Credit(s)
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.

483 - READING FOR THE SENIOR ESSAY
1.00 Credit(s)
Independent reading in preparation for the senior essay. Prerequisite: ENGL 384.

484 - SENIOR ESSAY 1
1.00 Credit(s)
Writing of a rough draft of the Senior Essay. Partially replaces 489 for students entering in Fall 1990. Prerequisite: ENGL 483.

485 - SENIOR ESSAY 2
2.00 Credit(s)
Final draft and oral presentation of the Senior Essay. Partially replaces 489 for students entering in Fall 1990. Prerequisite: ENGL 484.

490 - SPECIAL TOPICS IN ENGLISH
1.00 to 4.00 Credit(s)
Prerequisite: 300-level course.

497 - INDEPENDENT STUDY IN LITERATURE
1.00 to 3.00 Credit(s)

498 - INDEPENDENT STUDY IN WRITING
1.00 to 3.00 Credit(s)

499 - INDEPENDENT STUDY IN JOURNALISM
1.00 to 3.00 Credit(s)

DEPARTMENT OF FOREIGN LANGUAGES

(Department 113)

Subject - General Foreign Languages (AFLN) __________

Associate Professor Dickson (Chair); Professors Davey, Lippert; Associate Professors Dufault, Khoury; Assistant Professor Walter; Lecturers Boyle, Liechty.

The foreign language program is designed to train students to speak, understand, read, and write a foreign 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 foreign languages at the elementary and secondary levels.

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

Requirements for a non-teacher certification major in French or Spanish: 52 hours are required beginning with French 120 or Spanish 140; to include nine hours of civilization courses to be selected from among the following: 324, 325, 327, 328, 329 (French) or 351, 353, 354, 355, 356, 357, 358, 359 (Spanish). Students develop individual programs of study with advisers. Ordinarily courses are taken in sequence through French 312 or Spanish 342. Civilization courses assume completion of French 215 or Spanish 245. Unless otherwise indicated, other courses at the 300- and 400-level assume completion of French 312 or Spanish 342.

Requirements for a teacher-certification (Ohio) major in French or Spanish: 68 hours are required beginning with French 120 or Spanish 140; to include nine hours of civilization courses to be selected from those listed in the previous paragraph; six hours of literature courses are also required. Students develop
individual programs of study with advisers. Ordinarily courses are taken in sequence through French 312 or Spanish 342. Civilization courses assume completion of French 215 or Spanish 245. Unless otherwise indicated, other courses at the 300- and 400-level assume completion of French 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. Faculty advisers assist students in developing these programs of study. Language majors are also encouraged to develop a second academic area of interest in addition to their language major.

For a minor in French, German or Spanish: 37 hours are required beginning with French 120, German 130, or Spanish 140. Individual programs are devised for students, but emphasis is on language and civilization.

**Business Option for Spanish/French Majors**
A student wishing a major in French or Spanish with an option in business must complete a 30-hour program in the College of Business Administration.

**Business Option**
- Accounting 231
- Accounting 232
- Accounting 233 (Elective)
- Economics 100
- Economics 202
- Economics 203
- Marketing 351
- Managerial Finance 362
- Management 330
- Business Law 322

**000 - ORIENTATION**
1.00 Credit(s)
Familiarization with the department, requirements for majors, planning program of courses, university catalog, library, career and employment opportunities, foreign study opportunities, certification requirements; required of majors in the department.

**380 - TEACHING FOREIGN LANGUAGES**
4.00 Credit(s)
Theory and practice of current methods for teaching foreign languages in elementary and secondary schools; evaluation of textbooks; use of audio-visual media; methods of evaluating student progress. (One credit hour of field experience equals 30 hours.) Prerequisites: minimum of 18 hours in foreign languages; admission to teacher education or permission of the director of teacher education.

**403 - LITERATURE IN TRANSLATION**
3.00 Credit(s)
One-quarter course in either Spanish, French or German literature in translation. Focus on major writers and literary trends of different periods. Lectures and assignments in English. Does not fulfill the General Education requirement in Foreign Language.

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**Subject - French (FREN)**

**120 - ELEMENTARY FRENCH 1**
4.00 Credit(s)
To develop the ability to understand, speak, read and write French; functional grammar, early and fluent speaking; elementary reading based on French life, customs, and manners. Four class periods and one hour of scheduled laboratory/drill practice per week.

**121 - ELEMENTARY FRENCH 2**
3.00 Credit(s)
Continuation of FREN 120. Three class periods and one hour of scheduled laboratory/drill practice each week.

**122 - ELEMENTARY FRENCH 3**
3.00 Credit(s)
A conversation and culture course with limited presentation of structural items, designed to improve language skills introduced in the first two courses. Based on francophone cultural perspectives, the course emphasizes speaking and understanding through conversations in French, role playing and skits. Some written practice. Prerequisite: FREN 121 or proficiency established by placement examination.

**190 - SPECIAL TOPICS IN FRENCH**
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

**210 - BUSINESS FRENCH**
3.00 Credit(s)
A survey of French business practice including office procedures and advertisements. Students develop writing and conversational skills related to business. Some translation. Prerequisite: FREN 215 or permission of the department.

**214 - INTERMEDIATE FRENCH 1**
4.00 Credit(s)
The completion of basic French grammar begun in Elementary French 1 and 2. Conversational practice and composition based on reading passages, films, popular music, videos, and "cultural" capsules. Four class periods and one
hour of scheduled laboratory/drill practice per week. Prerequisite: FREN 122 or proficiency established by placement examination.

215 - INTERMEDIATE FRENCH 2
4.00 Credit(s)
Continuation of FREN 214.

217 - FRENCH PHONETICS
3.00 Credit(s)
A basic introduction to linguistic terminology and a comparative analysis of the French and English sound systems, with emphasis on improving students' pronunciation in French. Open to all students. Prerequisites: FREN 122 or permission of the department.

219 - INTRODUCTION TO FRENCH LITERATURE
3.00 Credit(s)
An intermediate-level course intended as an introduction to serious reading in French. Class discussion, in French, based on selections of short literary masterpieces (classic and modern). Prerequisite: FREN 215 or permission of department.

290 - SPECIAL TOPICS IN FRENCH
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

297 - INDEPENDENT STUDY IN FRENCH
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

311 - FRENCH CONVERSATION AND COMPOSITION
3.00 Credit(s)
To increase oral and written proficiency in French through the use of communicative activities, conversations with native speakers, and writing of articles. Prerequisite: FREN 215 or permission of the department.

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

314 - THE FRENCH TEXT: THE SHORT STORY
3.00 Credit(s)
Reading of short fiction by classic and contemporary authors. Selections progress according to difficulty. Prerequisite: FREN 215 or permission of the department.

315 - THE FRENCH TEXT: THE NOVEL
3.00 Credit(s)
Reading of contemporary and classical novels, primarily for fluency of comprehension. Study of the genre's development in French literature. Prerequisite: FREN 215 or permission of the department.

316 - THE FRENCH TEXT: THE ESSAY AND NON-LITERARY TEXTS
3.00 Credit(s)
Study of selected essays from the work of Montaigne, Pascal, Rousseau, Camus, Sartre and others. Survey of the French press. Reading in Le Monde, l'Express, other periodicals and nonliterary works. Prerequisite: FREN 215 or permission of department.

319 - FRENCH POETRY AND SONG
3.00 Credit(s)
Rules of French versification. Study of selected works of major poets from the Middle Ages to the twentieth century. Modern interpretations of poetry into song by Brassens, Ferrat, Moustaki and others. Prerequisite: FREN 215 or permission of department.

324 - THE FRENCH FILM
3.00 Credit(s)
General survey of French cinema. Emphasis includes origins of French film, periods, directors, acting and sets. Prerequisite: FREN 215 or permission of the department.

325 - FRENCH MEDIA: TELEVISION
3.00 Credit(s)
General survey of French television, origins, development, tendencies and programming. Prerequisite: FREN 215 or permission of the department.

327 - FRENCH CIVILIZATION: CONTEMPORARY FRANCE
3.00 Credit(s)
Introduction to contemporary French culture, an interdisciplinary approach. Includes such topics as class, the family, leisure activities, attitudes, communication, role of the arts, political parties, and education. Prerequisite: FREN 215 or permission of the department.

328 - FRENCH CIVILIZATION: HISTORY OF FRANCE
3.00 Credit(s)
A survey of the history, geography, political institutions of France. Prerequisite: FREN 215 or permission of the department.
329 - FRENCH CIVILIZATION: FRANCOPHONE CULTURES
3.00 Credit(s)
A survey of francophone cultures in the world. Emphasis on Africa and French-speaking Canada. Prerequisite: FREN 215 or permission of the department.

390 - SPECIAL TOPICS IN FRENCH
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

415 - ADVANCED FRENCH GRAMMAR
3.00 Credit(s)
Intense study of French grammar. Comparative French and English grammar, with frequent translation exercises. Prerequisite: FREN 312 or permission of the department.

416 - THE FRENCH THEATRE
3.00 Credit(s)
Historic study of the genre through selection of plays of the 17th, 18th, 19th, and 20th centuries. Course includes listening to performances, or when possible, attending performances or films. Prerequisite: FREN 312 or permission of the department.

418 - FRANCOPHONE LITERATURE OF THE TWENTIETH CENTURY
3.00 Credit(s)
Study of contemporary writers representing literary movements and tendencies in the French-speaking world. Prerequisite: FREN 312 or permission of the department.

490 - SPECIAL TOPICS IN FRENCH
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

497 - INDEPENDENT STUDY IN FRENCH
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

131 - ELEMENTARY GERMAN 2
3.00 Credit(s)
Continuation of GRMN 130. Three class periods and one hour of scheduled laboratory/drill practice each week.

132 - ELEMENTARY GERMAN 3
3.00 Credit(s)
Continuation of GRMN 131. Three class periods and occasional laboratory drill practice.

191 - SPECIAL TOPICS IN GERMAN
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

220 - BUSINESS GERMAN
3.00 Credit(s)
A survey of German business practice including office procedure and advertisements. Students develop writing and conversational skills related to business. Some translation. Prerequisite: GRMN 225 or permission of the department.

224 - INTERMEDIATE GERMAN 1
4.00 Credit(s)
Review of the fundamentals of grammar, pronunciation, vocabulary, and idioms; conversational practice and composition; readings and discussion about German life and culture; occasional viewing of slides, films, and newsreels. Four class periods and one hour of scheduled laboratory/drill practice per week. Prerequisite: GRMN 132 or proficiency established by placement examination.

225 - INTERMEDIATE GERMAN 2
4.00 Credit(s)
Continuation of GRMN 224.

261 - INTRODUCTION TO GERMAN LITERATURE
3.00 Credit(s)
Reading and discussion of well-known poetry, plays, and short prose selections, from classic to contemporary. Presentations, in German, to focus on genre, the work as representative of literary movements, and the reflection of society and social change in literature. Prerequisite: GRMN 132 or permission of the department.

291 - SPECIAL TOPICS IN GERMAN
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

298 - INDEPENDENT STUDY IN GERMAN
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

Subject - German (GRMN)
321 - GERMAN CONVERSATION AND COMPOSITION 1
3.00 Credit(s)
To develop a useful command of the German language and an appreciation of German civilization. Material and topics chosen to encourage and facilitate speaking and writing ability. Occasional laboratory practice. An advanced study of grammatical and phonetic problems aimed at perfecting clarity and accuracy of expression. Prerequisite: GRMN 225 or proficiency established by placement examination.

322 - GERMAN CONVERSATION AND COMPOSITION 2
3.00 Credit(s)
Continuation of GRMN 321.

323 - GERMAN CONVERSATION AND COMPOSITION 3
3.00 Credit(s)
Continuation of GRMN 322.

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

338 - CONTEMPORARY GERMANY
3.00 Credit(s)
An examination of the Federal Republic and the German Democratic Republic from their beginnings to the Reunification. Topics include social services, communications, political parties, foreign workers, current issues, the educational system, employment, family life, language and leisure. Presentations, discussions and readings in German. Prerequisite: GRMN 225 or permission of the department.

339 - AUSTRIA AND SWITZERLAND
3.00 Credit(s)
A study of contemporary social, cultural and political elements in the two countries. This survey will examine the political and social structures, educational system, working world, language differences, and leisure activities of each country. Presentations, discussions, and readings in German. Prerequisite: GRMN 225 or permission of the department.

391 - SPECIAL TOPICS IN GERMAN
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

491 - SPECIAL TOPICS IN GERMAN
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

498 - INDEPENDENT STUDY IN GERMAN
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

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Subject - Japanese (JAPN)

161 - ELEMENTARY JAPANESE 1
4.00 Credit(s)
Students will learn the basic grammatical structure of Japanese and begin to acquire fluency through daily conversations. Appropriate cultural behavior and social customs will be emphasized. Introduction of basic reading and writing skills.

162 - ELEMENTARY JAPANESE 2
3.00 Credit(s)
Continuation of Elementary Japanese 1. Prerequisite: JAPN 161 or permission of the department.

163 - ELEMENTARY JAPANESE 3
3.00 Credit(s)
Continuation of Elementary Japanese 2. Prerequisite: JAPN 162 or permission of the department.

264 - INTERMEDIATE JAPANESE 1
4.00 Credit(s)
The primary objective is to build oral proficiency and increase vocabulary. Emphasis will be given to reading and writing Japanese. Various aspects of culture will be explored.

265 - INTERMEDIATE JAPANESE 2
4.00 Credit(s)
Continuation of Intermediate Japanese 1. Prerequisite: JAPN 264 or permission of the department.

266 - INTERMEDIATE JAPANESE 3
4.00 Credit(s)
Continuation of Intermediate Japanese 2. Prerequisite: JAPN 265 or permission of the department.
Subject - Russian (RUSS)

150 - ELEMENTARY RUSSIAN 1
4.00 Credit(s)
To develop the ability to understand, speak, read and write Russian; functional grammar; early speaking; elementary reading based on Russian life, customs, and manners.

151 - ELEMENTARY RUSSIAN 2
3.00 Credit(s)
Continuation of Elementary Russian 1. Prerequisite: RUSS 150 or permission of department.

152 - ELEMENTARY RUSSIAN 3
3.00 Credit(s)
Continuation of Elementary Russian 2. Prerequisite: RUSS 151 or permission of department.

250 - INTERMEDIATE RUSSIAN 1
4.00 Credit(s)
Continuation and completion of the study of Russian grammar. Emphasis is also placed on practical applications of the spoken languages in everyday situations, and on listening comprehension by listening to audiotapes and viewing a series on video-cassette. Prerequisites: RUSS 152 and permission of the department.

251 - INTERMEDIATE RUSSIAN 2
4.00 Credit(s)
Continuation of RUSS 250.

252 - INTERMEDIATE RUSSIAN 3
4.00 Credit(s)
Continuation of RUSS 251.

296 - INDEPENDENT STUDY IN RUSSIAN
1.00 to 3.00 Credit(s)
May be repeated as topic varies. Prerequisite: RUSS 152 or permission of department.

Subject - Spanish (SPAN)

140 - ELEMENTARY SPANISH 1
4.00 Credit(s)
To develop the ability to understand, speak, read and write Spanish; functional grammar; early speaking; elementary reading based on Hispanic life, customs, and manners, using materials dealing with Spain, Mexico, and South America. Four class periods and one scheduled laboratory/drill practice per week.

141 - ELEMENTARY SPANISH 2
3.00 Credit(s)
Continuation of SPAN 140. Three class periods and one hour of scheduled laboratory/drill practice each week. Prerequisite: SPAN 140 or proficiency established by placement examination.

142 - ELEMENTARY SPANISH 3
3.00 Credit(s)
A conversation and culture course with limited presentation of structural items, designed to improve language skills introduced in the first two courses. Based on Hispanic cultural perspectives, the course emphasizes speaking and understanding through conversations in Spanish, role playing and skits, and some written practice. Prerequisite: SPAN 141 or proficiency established by placement examination.

192 - SPECIAL TOPICS IN SPANISH
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

240 - BUSINESS SPANISH
3.00 Credit(s)
A survey of Spanish business practice including office procedure and advertisements. Students develop writing and conversational skills related to business. Some translation. Prerequisite: SPAN 245 and permission of the department.

244 - INTERMEDIATE SPANISH 1
4.00 Credit(s)
A review of grammar and pronunciation; conversational practice and occasional lectures in Spanish on Hispanic life, history, art and civilization, illustrated with slides, photographs, reproductions, and realia. Four class periods and one hour of scheduled laboratory/drill practice per week. Prerequisite: SPAN 142 or proficiency established by placement examination.

245 - INTERMEDIATE SPANISH 2
4.00 Credit(s)
Continuation of SPAN 244. Prerequisite: SPAN 244 or proficiency established by placement examination.

248 - SPANISH PHONETICS
3.00 Credit(s)
A basic introduction to linguistic terminology and a comparative analysis of the Spanish and English sound systems, with emphasis on improving students' pronunciation in Spanish. Open to all students. Prerequisite: SPAN 141 and permission of the department.
292 - SPECIAL TOPICS IN SPANISH
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

299 - INDEPENDENT STUDY IN SPANISH
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

341 - SPANISH CONVERSATION AND COMPOSITION
3.00 Credit(s)
Extensive oral and written practice designed to increase control of vocabulary and grammatical structures, especially the verb system. Prerequisite: SPAN 245 and permission of the department.

342 - ADVANCED SPANISH LANGUAGE STUDY
3.00 Credit(s)
An intensive study of grammar and syntax with emphasis on constructions of high-frequency usage. Written compositions and oral practice. Prerequisite: SPAN 341 and permission of the department.

351 - HISPANIC CULTURAL PERSPECTIVES
3.00 Credit(s)
A study of how Spaniards and Spanish Americans view the world, in contrast to typical American perspectives. Emphasis on the various social concepts, attitudes, orientations, and life styles which make up different and sometimes unique points of view. Prerequisite: SPAN 245 and permission of department.

353 - SPAIN TO THE NINETEENTH CENTURY
3.00 Credit(s)
Integrates the geographical, political, economic, social, and cultural forces which have molded Spain from prehistoric times to the nineteenth century. Outside reading and written reports on assigned topics. Prerequisite: SPAN 245 and permission of department.

354 - LATIN AMERICA TO THE TWENTIETH CENTURY
3.00 Credit(s)
A general survey of the geography, history, and cultural forces of Latin America up to the twentieth century, with special attention to the pre-Columbian indigenous culture of Mexico, Central and South America. Reference to architecture, sculpture, ceramics and other art forms. Outside reading and written reports on assigned topics. Prerequisite: SPAN 245 and permission of department.

355 - CONTEMPORARY SPAIN AND LATIN AMERICA
3.00 Credit(s)
A general survey of contemporary Spain and Latin America. Political, economic, social and cultural evolution. Artistic and literary creation. Modern Spanish thought. Outside reading and written reports on assigned topics. Prerequisite: SPAN 245 and permission of department.

356 - SPANISH ART, MUSIC AND DANCE
3.00 Credit(s)
The development in Spanish art, music and dance up to the present day. Major emphasis is on the twentieth century. Outside reading and listening (music) and written reports on assigned topics. Prerequisites: SPAN 245 and permission of the department.

357 - LATIN AMERICAN ART, MUSIC AND DANCE
3.00 Credit(s)
The development in Latin American art, music and dance up to the present day. Major emphasis is on the twentieth century. Outside reading and listening (music) and written reports on assigned topics. Prerequisites: SPAN 245 and permission of the department.

358 - SPANISH MEDIA
3.00 Credit(s)
A general survey of contemporary Spanish radio, television, newspapers and magazines. Written reports on assigned topics based on readings, listening (radio) and viewing (television). Prerequisite: SPAN 245 and permission of the department.

359 - LATIN AMERICAN MEDIA
3.00 Credit(s)
A general survey of contemporary Latin American radio, television, newspapers and magazines. Written reports on assigned topics based on readings, listening (radio) and viewing (television). Prerequisite: SPAN 245 and permission of the department.

392 - SPECIAL TOPICS IN SPANISH
1.00 to 3.00 Credit(s)
May be repeated as topic varies.

451 - SPANISH LITERATURE TO 1681
3.00 Credit(s)
A study of the chief authors of Spain from the beginnings up to and including the Golden Age. Prerequisite: SPAN 342.
DEPARTMENT OF HEALTH, PHYSICAL EDUCATION & SPORT STUDIES

(Department 143)

Professor Lauth (Chair); Associate Professors Campoli, Daugherty, Strayer; Assistant Professors Kaczkowski, Keller; Instructors Beaschler, Coleman, Conroy, Glon, Meyer, Witte; Lecturers Cole, Turner

Ohio Northern University's health, physical education and sports studies programs provide opportunities for students to acquire the scientific knowledge, skills, favorable attitudes, and desirable habits for personal and community health and safety. Students prepare for professions and graduate school work in health education, physical education, sports management, sports medicine, and wellness.

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 areas:

- Physical Education (K-12) 75-77 hours
- Health Education (K-12) 55-57 hours
- Physical Education (7-12) 53-55 hours
- Sports Medicine 54 hours
- Sports Management 68 hours
- Health (non-teaching) 49 hours

The department provides courses of study leading to certification in the following areas:

- Driver Education - by the state of Ohio 9 hours
- Athletic Coaching Certification - by Ohio Northern University 23-25 hours

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

Physical Education Service Courses

Service courses are those courses listed below the 100 level. 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 Conditioning

Life Skills 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
- Raquetball
- Self Defense
- Square and Folk Dance
- Basketball
- Badminton

Special Requirements for Physical Education
Service Courses
- Tennis—tennis balls and racquet
- Golf—clubs (when possible)
- Intermediate Fitness—bicycle
- Racquetball—racquet, racquetballs, protective goggles
- Canoeing and Whitewater Rafting—fee required
- Bowling/Billiards—fee required
- Snow Skiing—fee required
- Hiking and Backpacking—fee required

 Majors in Health, Physical Education and Sports 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 offering 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 certification must complete requirements of the Center for Teacher Education and Certification.
Sports Management Internship 486
Sports Management Seminar 496
*Six additional hours in Communication Arts
*Three additional hours in Psychology-Sociology
*Nine additional hours in Business

ONU Coaching Certification 20-22 hours
First Aid and Safety 112
Basic Athletic Training 243
Sociology of Sport 256
Organization and Administration of Health, Physical Education, Recreation and Athletics 303
Psychology of Coaching 324
Advanced Coaching Externship 334, 335, 336
Two coaching theory courses (only one officiating course may apply)

Driver Education Endorsement 9 hours
Psychological Factors in Driving 219
Driver Education 433
Organization and Administration of Driving 434

Subject - Varsity Sports/Service Courses (AHPE)

<table>
<thead>
<tr>
<th>Course</th>
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<tr>
<td>001 - VARSITY FOOTBALL PARTICIPATION</td>
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<tr>
<td>002 - VARSITY CROSS COUNTRY PARTICIPATION (MEN)</td>
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<td>003 - VARSITY SOCCER PARTICIPATION (MEN)</td>
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<td>004 - VARSITY VOLLEYBALL PARTICIPATION</td>
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<td>005 - VARSITY BASKETBALL PARTICIPATION (MEN)</td>
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<td>006 - VARSITY BASKETBALL PARTICIPATION (WOMEN)</td>
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<tr>
<td>007 - VARSITY CROSS COUNTRY PARTICIPATION (WOMEN)</td>
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<td>008 - VARSITY SOCCER PARTICIPATION (WOMEN)</td>
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<td>010 - VARSITY TRACK PARTICIPATION (WOMEN)</td>
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<td>011 - VARSITY WRESTLING PARTICIPATION</td>
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<td>012 - VARSITY TRACK PARTICIPATION (MEN)</td>
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013 - VARSITY TENNIS PARTICIPATION (MEN)  
1 qtr hr

014 - VARSITY TENNIS PARTICIPATION (WOMEN)  
1 qtr hr

015 - VARSITY GOLF PARTICIPATION  
1 qtr hr

016 - VARSITY SOFTBALL PARTICIPATION  
1 qtr hr

017 - VARSITY BASEBALL PARTICIPATION  
1 qtr hr

018 - VARSITY SWIMMING PARTICIPATION (MEN AND WOMEN)  
1 qtr hr

021 - WEIGHT TRAINING AND PHYSICAL CONDITIONING  
1.00 Credit(s)  
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.

024 - BEGINNERS GOLF  
1.00 Credit(s)  
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.

027 - GOLF AND TENNIS  
1.00 Credit(s)  
An introduction to golf and tennis skills for the beginning student. Emphasis will be placed on basic rules, playing strategies and skill development for life-time recreational enjoyment.

029 - RACQUETBALL  
1.00 Credit(s)  
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.

030 - BEGINNERS SWIMMING  
1.00 Credit(s)  
Only non-swimmers are allowed to take this course. To develop knowledge and skills necessary to save oneself and others. To provide background so students can progress toward Lifeguarding and Water Safety Instructor's certificate. Intermediate and advanced swimmers should not register for this course.

033 - INTERMEDIATE SWIMMING  
1.00 Credit(s)  
To appreciate the recreational as well as physiological benefits of swimming. To perfect those elements found in beginning swimming and to further develop skills and knowledge necessary for increased enjoyment and safety in and around water. To further develop a working knowledge of basic rescue skills to ensure the safety of oneself and others. To acclimate oneself to the medium of deep water, both psychologically and physiologically.

034 - BOWLING  
1.00 Credit(s)  
To offer 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.

036 - BEGINNING FITNESS  
1.00 Credit(s)  
An introduction to the 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 could include aerobic exercise or dance, self-paced walking and cardiovascular conditioning (jogging).

037 - INTERMEDIATE FITNESS  
1.00 Credit(s)  
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, hydrotobics (fitness swimming), running and power walking.

038 - ADVANCED FITNESS  
1.00 Credit(s)  
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.

040 BILLIARDS  
1.00 Credit(s)  
To offer each student the opportunity to learn and participate in the fundamentals of billiards.
083 - SQUARE AND FOLK DANCE
1.00 Credit(s)
To develop skills in folk and square dance. To acquire an understanding of the background and tradition (American and other countries) of folk and square dance. To develop an appreciation of folk and square dancing. A carry over activity for later life.

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

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

088 - WEIGHT CONTROL AND NUTRITION
1.00 Credit(s)
An introductory course to basic nutrition and methods of healthy weight loss which could include prescribed activity.

090 - SPECIAL TOPICS IN HEALTH, PHYSICAL EDUCATION & SPORTS STUDIES
1.00 to 3.00 Credit(s)

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

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

000 - ORIENTATION-HEALTH, PHYSICAL EDUCATION, SPORTS STUDIES
1.00 Credit(s)

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

110 - INTRODUCTION TO HEALTH AND FITNESS (WELLNESS)
3.00 Credit(s)
Basic knowledges, understandings and values of physical activity as well as wise health choices as these physical activities and health choices relate to optimal healthful living and positive wellness. Designed for individuals, regardless of age or sex, who desire total health/wellness through a combination and application of attitudes, knowledges and wise health choices/activities within the realm of diet, nutrition and exercise.

111 - PERSONAL HEALTH
3.00 Credit(s)
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 AND SAFETY
3.00 Credit(s)
Lectures, discussion and practice in the giving of first aid in emergencies. The American Red Cross Certificate and CPR certification may be obtained by students who pass an examination.

114 - ADVANCED LIFEGUARDING
2.00 Credit(s)
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.

115 - WATER SAFETY INSTRUCTION
3.00 Credit(s)
Teaching of swimming and water safety skills, methods and techniques. Successful completion of the course will lead to American Red Cross Water Safety Instruction certificate. Meets 5 days per week. Prerequisite: Current certification in advanced lifesaving.

119 - SCHOOL AND COMMUNITY HEALTH
3.00 Credit(s)
Skills and knowledge for aiding teachers and others to observe and understand the school child in health and illness; the health program of the public schools and the relationship of the school to the students' habits, attitudes and knowledge conducive to good health. Health matters with focus on health problems amenable to community action. Health and physical education majors only or permission of department chair.
083 - SQUARE AND FOLK DANCE
1.00 Credit(s)
To develop skills in folk and square dance. To acquire an understanding of the background and tradition (American and other countries) of folk and square dance. To develop an appreciation of folk and square dancing. A carry over activity for later life.

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

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

088 - WEIGHT CONTROL AND NUTRITION
1.00 Credit(s)
An introductory course to basic nutrition and methods of healthy weight loss which could include prescribed activity.

090 - SPECIAL TOPICS IN HEALTH, PHYSICAL EDUCATION & SPORTS STUDIES
1.00 to 3.00 Credit(s)

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

110 - INTRODUCTION TO HEALTH AND FITNESS (WELLNESS)
3.00 Credit(s)
Basic knowledges, understandings and values of physical activity as well as wise health choices as these physical activities and health choices relate to optimal healthful living and positive wellness. Designed for individuals, regardless of age or sex, who desire total health/wellness through a combination and application of attitudes, knowledge and wise health choices/activities within the realm of diet, nutrition and exercise.

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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.

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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.

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Teaching of swimming and water safety skills, methods and techniques. Successful completion of the course will lead to American Red Cross Water Safety Instruction certification. Meets 5 days per week. Prerequisite: Current certification in advanced lifesaving.

119 - SCHOOL AND COMMUNITY HEALTH
3.00 Credit(s)
Skills and knowledge for aiding teachers and others to observe and understand the school child in health and illness; the health program of the public schools and the relationship of the school to the students’ habits, attitudes and knowledge conducive to good health. 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 Credit(s)
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.

133 - GENERAL METHODS - MAJORS
2.00 Credit(s)
The fundamental skills, methods and techniques in teaching the following activities: track and field, basketball, softball, recreational games. Offered even years.

147 - BASIC MOVEMENT - MAJORS
2.00 Credit(s)
The principles and laws of motion as applied to basic human movement and performance. An introduction to the basic locomotor and axial movements possible in the human body and the utilization of these basic movements as they are combined in the efficient performance of complex tasks.

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

190 - SPECIAL TOPICS IN HEALTH, PHYSICAL EDUCATION, AND SPORTS STUDIES
1.00 to 3.00 Credit(s)

210 - ADVANCED FIRST AID-EMERGENCY CARE
3.00 Credit(s)
To increase knowledge, skill and experience in the application of first aid and emergency care. Students must hold a current and valid American Red Cross first aid card. Information and skills will build upon those acquired while completing requirements of the Standard First Aid and Personal Safety Course or Multi-Media First Aid Course. Successful completion of this course entitles the student to an American Red Cross Advanced First Aid Card.

212 - DANCE - MAJORS
3.00 Credit(s)
Required of all physical education majors. The fundamental 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 Credit(s)
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 Credit(s)
A study of behavior with emphasis on attitudes, motivation, and adjustment and their relationship to unsafe driving. Investigation of principles and methods appropriate in identifying, understanding, and modifying unsatisfactory driving behavior. Prerequisite: PSYC 133.

223 - KINESIOLOGY
3.00 Credit(s)
The study of the general body mechanics of the human organism; the activities of the physical education program in their relation to coordination and the proper body mechanics, analysis of movement. Prerequisites: BIOL 231 and 232.

233 - PHYSICAL EDUCATION FOR THE ELEMENTARY SCHOOL
3.00 Credit(s)
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. Includes approximately 10 hours of field experience.

243 - BASIC ATHLETIC TRAINING
3.00 Credit(s)
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.

256 - SOCIOLOGY OF SPORT
3.00 Credit(s)
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
3.00 Credit(s)
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.

271 - MOTOR LEARNING
3.00 Credit(s)
The study of rather permanent change in performance brought about through practice and excludes changes due to maturation, drugs or nutrients.

280 - ATHLETIC TRAINING CLINICAL - LEVEL 1
1.00 Credit(s)
Under the supervision of the Certified Athletic Trainer, students will undertake observation of training room operations and duties of the athletic trainer. The acquisition of basic skills and knowledge is expected. Prerequisites: HPES 112 and 243.

290 - SPECIAL TOPICS IN HEALTH, PHYSICAL EDUCATION AND SPORTS STUDIES
1.00 to 3.00 Credit(s)

300 - HEALTH PROMOTION PRACTICUM
3.00 Credit(s)
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: HPES 099, 110, 112, 243 and 261.

303 - ORGANIZATION AND ADMINISTRATION OF HEALTH, PHYSICAL EDUCATION, RECREATION AND ATHLETICS
3.00 Credit(s)
Examination of the philosophy, principles, problems, policies and procedures essential in the organization and administration of meaningful programs in health education, physical education, recreation and athletics. Prerequisite: HPESS majors only and junior status.

304 - PRACTICAL TECHNIQUES OF TEACHING AND ASSISTING IN HEALTH AND PHYSICAL EDUCATION
1.00 Credit(s)
Required of all physical education majors, preferably in their junior year. This class involves assisting in service classes. Permission of Department Chair required.

305 - PRACTICAL TECHNIQUES OF TEACHING AND ASSISTING IN HEALTH AND PHYSICAL EDUCATION
1.00 Credit(s)
Continuation of HPES 304. Required of all physical education majors. Prerequisites: HPES 304 and permission of the department chair.

306 - PRACTICAL TECHNIQUES OF TEACHING AND ASSISTING
1.00 Credit(s)
Continuation of HPES 304-305. Permission of Department Chair required.

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

310 - TECHNIQUES - COACHING SOFTBALL
2.00 Credit(s)
To develop a basic expertise in the knowledge and techniques of coaching softball. To provide laboratory experiences in the practical application of techniques and knowledge of coaching softball. Offered odd numbered years.

315 - OFFICIATING-VOLLEYBALL
2.00 Credit(s)
Knowledge and techniques of officiating volleyball. National Federation rules. Laboratory experiences during intramural volleyball. Offered even numbered years. Federation licensing available upon successful completion of course.

317 - THEORY OF TRACK AND FIELD officiating
2.00 Credit(s)
Knowledge and techniques of officiating track and field. National Federation rules. Laboratory experiences during intramural track and field. Offered odd numbered years.

319 - THEORY AND METHOD OF COACHING TRACK
2.00 Credit(s)
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 Credit(s)
Equipment, fundamentals of the art and skill of wrestling. Students may acquire state certification in wrestling officiating. Offered even numbered years only.

321 - THEORY OF FOOTBALL COACHING
2.00 Credit(s)
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 Credit(s)
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 Credit(s)
Individual position and team play in men's baseball. Lectures, reports, demonstration, and practice.

324 - PSYCHOLOGY OF COACHING
3.00 Credit(s)
The cultural, emotional, psychological and sociological aspects of coaching. Player-coach relationship, understanding the athlete, improving coaching effectiveness.

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

334 - ADVANCED COACHING INTERNSHIP-EXTERNSHIP
1.00 to 3.00 Credit(s)
Coaching under supervision in all sports in season. Hours arranged. Six hours maximum toward graduation. Prerequisite: Permission of Department Chair.

335 - ADVANCED COACHING INTERNSHIP-EXTERNSHIP
1.00 to 3.00 Credit(s)
Prerequisite: Permission of Department Chair.

336 - ADVANCED COACHING INTERNSHIP-EXTERNSHIP
1.00 to 3.00 Credit(s)
Prerequisite: Permission of Department chair.

342 - BASKETBALL OFFICIATING
2.00 Credit(s)
The study of basketball rules and mechanics from the standpoint of player, coach and official. Taught odd numbered years.

350 - HEALTH METHODS AND EVALUATION
4.00 Credit(s)
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. Prerequisites: Two quarters of health, one of which must be HPES 111; admission to Teacher Education or permission of the Director of Teacher Education. Includes 30 hours of field experience.

351 - METHODS AND PRINCIPLES OF PHYSICAL EDUCATION
4.00 Credit(s)
Methods, devices and techniques which are most effective in the teaching of the discipline in the public schools. Lab experiences in area schools. Prerequisite: One year of physical education for majors and junior status; admission to Teacher Education or permission of the Director of Teacher Education. Includes 30 hours of field experience.

355 - ORGANIZATION & ADMINISTRATION OF HEALTH PROMOTION PROGRAMS
3.00 Credit(s)
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. Prerequisites: Junior status and 45 hours of Wellness and Health Promotion major courses.

360 - TESTS AND MEASUREMENT OF HEALTH, PHYSICAL EDUCATION, AND ATHLETICS
3.00 Credit(s)
Fundamental considerations of measurement: physical education and health measurements; test evaluation; criteria of tests; validity of tests; accuracy of tests; physical fitness; skills tests; application of measurement; elements of statistics.
371 - THERAPEUTIC MODALITIES IN ATHLETIC TRAINING
4.00 Credit(s)
Indications and contraindications of therapeutic modalities in the treatment of athletic injuries as they relate to the healing process. Prerequisites: BIOL 231, 232, 233; and HPES 112 and 243.

372 - EXERCISE REHABILITATION IN ATHLETIC TRAINING
4.00 Credit(s)
IBasic components of a comprehensive rehabilitation program. Selection of therapeutic exercises for injuries/corrective surgeries sustained by the competitive athlete. Prerequisites: HPES 371

375 - EVALUATION TECHNIQUES IN ATHLETIC TRAINING
4.00 Credit(s)
The practical application of the injury evaluation process, incorporating orgins, 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 112 and 243.

376 - EVALUATION TECHNIQUES IN ATHLETIC TRAINING
4.00 Credit(s)
Continuation of HPES 375, but focusing on the lower body, with an in-depth look at postural abnormalities and goniometric measurements of selected joints. Prerequisite: HPES 375.

380 - ATHLETIC TRAINING CLINICAL - LEVEL 2
1.00 Credit(s)
Under supervision of the Certified Athletic Trainer, students will be provided the opportunity to practice those skills necessary of the athletic trainer. The student will assist staff and upper class students. Prerequisites: BIOL 231; HPES 280 and 375; and 425 hours of internship.

390 - SPECIAL TOPICS IN HEALTH, PHYSICAL EDUCATION, AND SPORTS STUDIES
1.00 to 3.00 Credit(s)

402 - ADAPTIVE AND CORRECTIVE PHYSICAL EDUCATION
3.00 Credit(s)
For the professionals who are concerned with the physical education of the handicapped; to develop an understanding of the various handicapping conditions and to explore methods of adapting physical activities to meet the needs of the atypical student in the physical education class. Prerequisite: HPES 223.

421 - LEGAL ISSUES IN PE & SPORT
3.00 Credit(s)
The purpose of the course is to develop 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 Credit(s)
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 Credit(s)
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.

480 - ATHLETIC TRAINING CLINICAL - LEVEL 3
1.00 Credit(s)
Under the supervision of the Certified Athletic Trainer students will be provided the opportunity to practice those skills necessary of the athletic trainer. The students who have shown to be capable and responsible will have the major responsibility of covering a sport, to begin to develop independent athletic training skills. Prerequisites: HPES 380 and 925 hours of internship.

481 - ATHLETIC TRAINING CLINICAL - LEVEL 4
1.00 Credit(s)
Under the supervision of the Certified Athletic Trainer the student will be provided the opportunity to practice those skills acquired. The student is expected to take a leadership role in the clinical setting. Prerequisite: HPES 480.

485 - WELLNESS AND HEALTH PROMOTION INTERNSHIP
3.00 to 15.00 Credit(s)
Participation in a broad based, off-campus experience designed to place the student in a fitness development or health promotion program under the supervision of the University as well as a worksite supervisor. Prerequisites: Senior status; 2.00 GPA; 2.50 GPA in major; 143-355; and permission of the department chair required.
486 - INTERNSHIP
1.00 to 15.00 Credit(s)
Specially planned sports management work throughout the quarter to provide direct employment experience. Emphasis is on the practical application of theory and knowledge in developing professional skills. To be taken concurrently with the Sports Management Seminar to assist the students with the integration of field work and classroom learning. Permission of Department Chair required.

490 - SPECIAL TOPICS IN HEALTH, PHYSICAL EDUCATION, AND SPORTS STUDIES
1.00 to 3.00 Credit(s)

494 - HEALTH SEMINAR
3.00 Credit(s)
An indepth analysis of current health problems, issues and trends as they apply to the teacher of health education. Offered even numbered years.

496 - SPORTS MANAGEMENT SEMINAR
1.00 Credit(s)
Discussion and analysis of the field setting, practice and organization. Includes monitoring and evaluation of the student internships. To be taken concurrently with Sports Management Internship.

497 - INDEPENDENT STUDY
1.00 to 3.00 Credit(s)
Permission of Department Chair required.

DEPARTMENT OF HISTORY AND POLITICAL SCIENCE

Subject - History (HIST)

Professors Davis, Ludanyi, Pettier, Saffell; Associate Professors Scott, Wilson (Chair); Assistant Professors Lomax, Loughlin; Visiting Assistant Professors Mackey, Williams

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 1992-93 recipient of this professorship is Ellen S. Wilson, associate professor of history.

The Kernan Robson Chair of Government, inaugurated in 1972, has been made possible by a trust established by the late Kernan Robson. The 1992-93 recipient of this professorship is JoAnn M. Scott, associate professor of political science.

The department offers separate majors in history, political science, criminal justice, and international studies. To pursue a dual major students must complete all the requirements for each separate major.

Majors in history and political science prepare students generally for careers in teaching, law, journalism, government service, or business. Criminal justice prepares students for employment in law enforcement, corrections, and court management. International studies majors prepare for careers in government or business. There are special departmental advisors for prelaw and teacher certification.

There are active chapters of Phi Alpha Theta, the national history honorary, Pi Sigma Alpha, the national political science honorary, and Alpha Phi Sigma, the national criminal justice honorary. Public service internships are available at all levels of government, including the Ohio Legislature. Public history internships include work in museums and in archival management. Students annually participate in the National Model United Nations in New York City and a mock trial program in Des Moines, Iowa. The department also offers students the opportunity to participate in the Washington Semester Program sponsored by American University.

The department also participates in study-abroad programs. Students majoring in history are encouraged to consider a term or year abroad at St. David's University College in Wales. Political science, criminal justice, and international studies majors are directed toward Glasgow Caledonian University.

Major in History
Specific requirements for the history major:
Orientation 000 1 hour
History 110-111 6 hours
History 204 3 hours
Political Science 201-202-203 9 hours
History 211-212-213 9 hours
One contemporary affairs course (221-222-223-224-225-226) 3 hours
History 488 and 489 3 hours
30 hours history electives, distributed as follows:
World History—6 hours
(excluding contemporary affairs courses)
American History—6 hours
Electives—18 hours
(excluding contemporary affairs courses)

Minor in History
History 110-111 6 hours
American History 211, 212, 213 9 hours
Contemporary Affairs 221, 222, 223, 224, 225, 226 3 hours

HISTORY AND POLITICAL SCIENCE 103
Major in Political Science
Specific requirements for the political science major are:
Orientation 000 1 hour
Political Science 105 3 hours
Political Science 200 1 hour
American National Government 201, 202 6 hours
State and Local Government 203 3 hours
U.S. History 211, 212, 213 9 hours
Theory 455 and 456 or 457 6 hours
One contemporary affairs course (221-222-223-224-225-226) 3 hours
American politics 6 hours
World politics 6 hours
Political Science 488 and 489 3 hours
Electives 12 hours

Minor in Political Science
Political Science 105 3 hours
American National Government 201, 202, 203 9 hours
Contemporary Affairs 221, 222, 223, 224, 225, 226 3 hours
Political Thought (455, 456, 457 or 387) 3 hours
American Politics 6 hours
World Politics 6 hours
Elective 3 hours

Criminal Justice
Specific requirements for the Criminal Justice major:
Orientation 000 1 hour
Research Methods 200 1 hour
Introduction to Criminal Justice 121 3 hours
Criminology (Soc. 261) 3 hours
Police in America 241 3 hours
Corrections 245 3 hours
Psychology 100 4 hours
Psychology 215 or 305 or 311 3 hours
Psychology 301 or 421 3 hours
Political Science 202 3 hours
Political Science 426, 427, 441 (any one) 3 hours
Political Science 203, 312, 363, 436 (any two) 6 hours
Sociology 105 3 hours
Sociology 361 3 hours
Sociology 240, 243, 245, 247, 248, 340 (any two) 6 hours
History 211 or 212 or 213 3 hours
History 348 or 349 or 451 3 hours
Criminal Law 341 3 hours
Political Science 488 and 489 3 hours
Electives 6 hours

International Studies
Specific requirements for the International Studies major:
Orientation 000 1 hour
Political Science 200 1 hour
Political Science 221, 222, 223, 224, 225 (any two) 6 hours
Political Science 226 3 hours
Political Science 371 3 hours
Political Science 452 3 hours
Economics 202-203 6 hours
Economics 385 or 411 3 hours
Political Science 334, 335, 336, 421, 422, 441, 475 (any five) 15 hours
History 285, 325, 377, 378, 451, 471 (any three) 9 hours
Political Science 488 and 489 3 hours
Majors are required to show second year competency in a foreign language (usually French, Spanish, or German) as determined by the Department of Foreign Languages.
Majors are encouraged to take Religion 107 and Political Science 105 to meet general education requirements. In addition, they are required to take Economics 100.

Teacher Certification with Major in History or Political Science
History
Orientation 000 1 hour
Western Civilization 110-111 6 hours
Historiography 204 3 hours
American National Government 201, 202 6 hours
State and Local Government 203 3 hours
United States History 211, 212, 213 9 hours
Human Geography 226 3 hours
Ohio History 303 3 hours
African-American History 365 3 hours
Social Studies Methods 450 3 hours
Non-Western History 6 hours
European History 9 hours
U.S. History 6 hours
History 488 and 489 3 hours
Political Science
Orientation 000 1 hour
Political Science 105 3 hours
Political Science 200 1 hour
American National Government 201, 202, 6 hours
State and Local Government 203 3 hours
United States History 211, 212, 213 9 hours
Social Studies Methods 450 3 hours
Theory 455 and 456 or 457 6 hours
Political Science 488 and 489 3 hours
Non-Western/Third World Politics 3 hours
American Politics 6 hours
World Politics 6 hours
Electives 12 hours
Comprehensive Social Studies Certification

Ohio Northern University does not offer a degree in comprehensive social studies. Students may, however, obtain such certification through the efficient utilization of free electives taken in conjunction with a History Major. This will qualify the student for teaching certification in comprehensive social studies by the State Department of Education of Ohio.

In addition to the History Major, Social Studies Comprehensive requires a minimum of 51 hours distributed over 4 basic areas: political science, economics, and psychology/sociology. The student must complete a 30 hour concentration in either Political Science, Economics or Psychology/Sociology, and a 30 hour distributional requirement in the two areas outside the second concentration.

30 hour secondary concentration options:

A. Political Science
   P.S. 105  3 hours
   P.S. 201, 202, 203   9 hours
   P.S. 222, 223, 224, 225, 335, 336, 421, or 422   3 hours
   P.S. Electives at the 300-400 level   15 hours
   *required in History Major

B. Economics
   Econ. 100   3 hours
   Econ. 202-203   6 hours
   Econ. 383-384   6 hours
   Econ. Electives   15 hours

C. Psychology/Sociology
   Psych. 100   4 hours
   Soc. 105   3 hours
   Psych. 212, 215, and 252   10 hours
   Soc. 301   4 hours
   Soc. 203, 240, 241, 243, 245, 246, 247, 302,
   340, 341, 347, or 348   3 hours

30 hour distributional requirement

All of the following courses must be completed for Social Studies Certification, but no course taken as part of the 30 hour social science concentration can be counted toward the 30 hours.* Additional hours needed to fill the 30 hour requirement must be selected from those included in Elementary Education Concentration Areas in Political Science or Economics.

Cultural Anthropology   150   3 hours
Econ. 100, 202, 203   9 hours
Psych. 100, 212   7 hours
Soc. 105, 252   6 hours
Soc. Elective   3 hours
P.S. 105   3 hours

*e.g. A student choosing the Political Science concentration option cannot count P.S. 105 toward the 30 hour distributional requirement.

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

000 - HISTORY AND POLITICAL SCIENCE ORIENTATION
1.00 Credit(s)
Familiarization with the department, requirements for majors, planning a program of courses, the University catalog, careers and library. Required of departmental majors.

110 - WESTERN CIVILIZATION 1
3.00 Credit(s)
A broad historical study focusing on the development of Western Civilization from ancient times to 1648, designed to introduce the beginning student to the ideas, attitudes, and institutions basic to civilization as it developed in the West.

111 - WESTERN CIVILIZATION 2
3.00 Credit(s)
A broad historical study focusing on the development of Western Civilization from 1648 to the present, designed to introduce the beginning student to the ideas, attitudes, and institutions basic to civilization as it developed in the West.

190 - SPECIAL TOPICS IN HISTORY
1.00 to 3.00 Credit(s)
Can be repeated as the topic varies.

204 - HISTORIOGRAPHY AND HISTORICAL METHODS
3.00 Credit(s)
A brief survey of the history and philosophy of history from the Greeks to the present. Instruction in research methods appropriate for History majors. Students will examine the main currents of Western historical thought and method and will write a correctly documented research paper on a historical topic. Prerequisite: Sophomore status.

211 - HISTORY OF THE UNITED STATES TO 1800
3.00 Credit(s)
A survey of American colonial and United States history from 1492 to 1800. Emphasis is placed on the formation of American political, economic, and social attitudes and their application in the early Republic.
212 - HISTORY OF THE UNITED STATES: 1800 TO 1898
3.00 Credit(s)
A survey of nineteenth century United States history. Emphasis is placed on the age of the common man, the struggle between North and South, and the rise of big business.

213 - HISTORY OF THE UNITED STATES 1898 TO THE PRESENT TIME
3.00 Credit(s)
A survey of twentieth century United States history. Major topics include the role played by the U. S. in global affairs and U. S. domestic policy, particularly the changed perceptions of welfare and civil rights.

221 - CONTEMPORARY EUROPE
3.00 Credit(s)
An explanation of the political, socioeconomic and intellectual development of Europe since the conclusion of the second World War. Open to freshmen.

222 - CONTEMPORARY ASIA
3.00 Credit(s)
An examination of the political, socioeconomic and intellectual development of Asia since the conclusion of the second World War. Open to freshmen.

223 - CONTEMPORARY AFRICA
3.00 Credit(s)
An examination of the political, socioeconomic and intellectual development of Africa since the conclusion of the second World War. Open to freshmen.

224 - CONTEMPORARY MIDDLE EAST
3.00 Credit(s)
An examination of the political, socioeconomic and intellectual development of the Middle East since the conclusion of the second World War. Open to freshmen.

225 - CONTEMPORARY LATIN AMERICA
3.00 Credit(s)
An examination of the political, socioeconomic and intellectual development of Latin America since the conclusion of the second World War. Open to freshmen.

226 - HUMAN GEOGRAPHY
3.00 Credit(s)
An analysis of the elements of human geography, including cultures, cultural regions, race, language and religion, human population, population movement, urbanization, and political organization. Open to freshmen.

285 - MILITARY AND SOCIETY IN THE WEST
3.00 Credit(s)
A survey of changes in military techniques and the effects of those developments on western society since 1000 A.D.

290 - SPECIAL TOPICS IN HISTORY
1.00 to 3.00 Credit(s)
Can be repeated as topic varies.

303 - HISTORY OF OHIO
3.00 Credit(s)
The political and cultural evolution of the area from prehistoric times to the present. Attention also will be given to Ohio as part of the regions known as the Old Northwest and the Middle West.

310 - AMERICAN URBAN HISTORY
3.00 Credit(s)
A study of the influence of the American city on American culture, and of the impact of American traditions on urban development, from colonial times to the present.

315 - THE WAR IN VIETNAM
3.00 Credit(s)
An examination of events leading to American military involvement in Vietnam, strategic decisions in waging the war, its effects in the United States, and the long-run consequences for national security policy and American politics.

321 - MEDIEVAL BRITAIN
3.00 Credit(s)
The British people in their political, social, and institutional development from the beginning of recorded history to the conclusion of the Wars of the Roses.

322 - TUDOR AND STUART BRITAIN
3.00 Credit(s)
An examination of the Tudor-Stuart period with special emphasis on the Henrician Reformation, the emergence of Britain as a world power, and the seventeenth century conflict between the Crown and Parliament.

324 - RUSSIAN HISTORY 1
3.00 Credit(s)
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 early Romanovs.
325 - RUSSIAN HISTORY 2
3.00 Credit(s)
A survey of Imperial Russia. Emphasis will be placed on the political, economic, social and intellectual climate from Peter the Great to Nicholas II and the economic intellectual climate leading to the Revolution of 1917.

348 - AMERICAN CONSTITUTION 1
3.00 Credit(s)
A study of the social and political forces that shaped constitutional political theory and of the interaction of law and politics through the Reconstruction era.

349 - AMERICAN CONSTITUTION 2
3.00 Credit(s)
The adaptation of the original Constitution to twentieth century problems of economic regulation, civil rights, industrial liberation, the welfare state and the American Empire.

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

354 - CIVIL WAR AND RECONSTRUCTION
3.00 Credit(s)
An intensive analysis of the Civil War era in American history. Special emphasis will be placed on slavery and other causal factors which precipitated the war between the states.

361 - RECENT AMERICAN HISTORY 1
3.00 Credit(s)
An intensive analysis of American history from the beginning of World War I until the conclusion of World War II.

362 - RECENT AMERICAN HISTORY 2
3.00 Credit(s)
An examination of the major social, economic, and political issues in American history since World War II.

365 - AFRICAN-AMERICAN HISTORY
3.00 Credit(s)
The essential facts, trends, and interpretations in the history of the black American from African beginnings to the present time.

372 - THE ANCIENT WORLD
3.00 Credit(s)
A survey of the political, social, and economic development of Near Eastern, Greek, and Roman civilizations during the ancient period.

373 - MEDIEVAL EUROPE
3.00 Credit(s)
Europe from the decline of the Roman Empire to the beginning of the Renaissance. Special attention is given to those institutions most instrumental in shaping modern European development. (Formerly HIST 326.)

374 - RENAISSANCE AND REFORMATION
3.00 Credit(s)
The political evolution of the Italian communes; the cultural development of the period; the Church and European society during the late Middle Ages and the development of Protestantism in Europe.

375 - AGE OF EUROPEAN ABSOLUTISM
3.00 Credit(s)
A survey of European civilization from 1598-1789 with emphasis on the development of the nation-state, divine right monarchy and absolutism, English parliamentary government, and the Enlightenment of the eighteenth century.

376 - THE FRENCH REVOLUTIONARY ERA
3.00 Credit(s)
A survey of France during the "old regime," social classes, the establishment of constitutional monarchy, the Republic and Robespierre, the crowds in the French Revolution, and Napoleon Bonaparte as protector of the Revolution.

377 - HISTORY OF MODERN EUROPE 1
3.00 Credit(s)
A survey focusing on Western Europe from 1815-1914. Emphasizes the search for stability in an age of revolution, industrialization, unification, nationalism, imperialism, and competing ideologies.

378 - HISTORY OF MODERN EUROPE 2
3.00 Credit(s)
A survey of Western Europe from 1914-1950. Examines the World Wars, the rise of totalitarianism, the onset of decolonization, and the origins of the Cold War.

381 - U.S. FRONTIER
3.00 Credit(s)
An examination of territorial expansion from colonial times to the end of the nineteenth century, emphasizing Indian relations, land policy, transportation and trade, and the influence of the West on American ideals and institutions. The course includes a brief consideration of comparative frontiers.
387 - AMERICAN POLITICAL THOUGHT
3.00 Credit(s)
An examination of American political theory commencing with the colonial period and proceeding to modern political thinkers.

390 - SPECIAL TOPICS IN HISTORY
1.00 to 3.00 Credit(s)
Can be repeated as topic varies.

450 - SOCIAL STUDIES METHODS
4.00 Credit(s)
Effective methods in teaching History, Political Science, Psychology, Sociology, Geography, and Anthropology. The class includes 30 hours of field experience. Prerequisites: Admission to Teacher Certification or permission of Director of Teacher Education. Does not count toward History major. Co-requisite: EDUC 412.

451 - HISTORY OF LAW
3.00 Credit(s)
A survey of the evolving principles of law as an instrument of social control, with an examination of legal norms as developed in Greek and Roman systems, canon law, law merchant and law maritime, civil law, common law and equity.

452 - AMERICAN FOREIGN RELATIONS
3.00 Credit(s)
A conceptual review of the inception, development and contemporary interpretation of the major foreign policies of the United States.

455 - WESTERNpolitical thought
3.00 Credit(s)
An examination of Western political theory commencing with the ancient period (Plato, Aristotle, Cicero) and proceeding to Machiavelli.

456 - WESTERN POLITICAL THOUGHT 2
3.00 Credit(s)
An examination of Western political theory commencing with the contract theorists (Rousseau, Locke, Hobbes) and proceeding to the age of the French Revolution (Burke).

457 - WESTERN POLITICAL THOUGHT 3
3.00 Credit(s)
An examination of Western political theory commencing with the early nineteenth century (Hegel) and proceeding to the twentieth century (Lenin, Nietzsche).

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

476 - MOCK TRIAL
3.00 Credit(s)
Prepares students to participate in both the regional and national mock trial competition held at the University of Toledo and Drake University, respectively. This course familiarizes students with the preparation of both civil and criminal cases including preparation and delivery of opening and closing statements, direct and cross-examination of witnesses, and preparation of objections. This course may be repeated a total of three times but only six hours may count toward departmental majors. Prerequisite: Permission of instructor.

481 - PUBLIC SERVICE INTERNSHIP PROGRAM
6.00 to 15.00 Credit(s)
Field experience in the area of public service. Selected students upon proper application, screening, and acceptance, will work in close relationship with public offices and officials. Those interns serving in a local agency would generally receive six quarter hours credit for approximately ten hours of service per week, while those interns serving in Columbus or Washington D.C. on a full-time quarterly basis, would generally receive fifteen hours credit. Prerequisites: Consultation with the department internship committee and completion of the application process. A maximum of six (6) hours will count toward major requirements.

488 - SENIOR RESEARCH PAPER 1
1.00 Credit(s)
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, Political Science, Criminal Justice or International Studies.

489 - SENIOR RESEARCH PAPER 2
2.00 Credit(s)
Students will write a research paper directed by a department faculty member relevant to their major. Required of all departmental majors. Students should enroll in this course before the quarter in which they expect to graduate. Prerequisites: Senior status; major in History, Political Science, Criminal Justice or International Studies.

490 - SPECIAL TOPICS IN HISTORY
1.00 to 3.00 Credit(s)
Can be repeated as topic varies.

494 - SEMINAR IN HISTORY
1.00 to 3.00 Credit(s)
Can be repeated as topic varies.

497 - INDEPENDENT STUDY IN HISTORY
1.00 to 3.00 Credit(s)
Approval of department chairman required prior to registration.
Subject - Political Science (PLSC)

000 - HISTORY AND POLITICAL SCIENCE ORIENTATION
1.00 Credit(s)
Familiarization with the department, requirements for majors, planning program of courses, University catalog, careers and library. Required of departmental majors.

105 - MODERN POLITICAL CONFLICTS AND ISSUES
3.00 Credit(s)
Fundamental political processes and principles, placed in the context of contemporary domestic and world problems.

121 - INTRODUCTION TO CRIMINAL JUSTICE
3.00 Credit(s)
Introduction to the basic concepts, issues and substance of American justice. Structures of the American criminal justice system, causes of criminal behavior, theories of law and punishment, the roles various actors play within the system, and major issues in Criminal Justice.

191 - SPECIAL TOPICS IN POLITICAL SCIENCE
1.00 to 3.00 Credit(s)
Can be repeated as topic varies.

200 - RESEARCH METHODS
1.00 Credit(s)
Instruction in research methods appropriate for History, Political Science, Criminal Justice, and International Studies majors. Students will become familiar with relevant library and other resource materials, and they will learn ways of organizing and writing research papers.

201 - AMERICAN NATIONAL GOVERNMENT 1
3.00 Credit(s)
An examination of the Constitution, federalism, interest groups, public opinion, political parties, and elections. Open to freshmen.

202 - AMERICAN NATIONAL GOVERNMENT 2
3.00 Credit(s)
An examination of the structure and operation of Congress, the presidency, the federal bureaucracy, and the federal court system. Open to freshmen.

203 - STATE AND LOCAL GOVERNMENT
3.00 Credit(s)
An examination of the structures and functions of state and local governments in the United States. Open to freshmen.

221 - CONTEMPORARY EUROPE
3.00 Credit(s)
An examination of the political, socioeconomic and intellectual development of Europe since the conclusion of World War II. Open to freshmen.

222 - CONTEMPORARY ASIA
3.00 Credit(s)
An examination of the political, socioeconomic and intellectual development of Asia since the conclusion of World War II. Open to freshmen.

223 - CONTEMPORARY AFRICA
3.00 Credit(s)
An examination of the political, socioeconomic and intellectual development of Africa since the conclusion of World War II. Open to freshmen.

224 - CONTEMPORARY MIDDLE EAST
3.00 Credit(s)
An examination of the political, socioeconomic and intellectual development of the Middle East since the conclusion of World War II. Open to freshmen.

225 - CONTEMPORARY LATIN AMERICA
3.00 Credit(s)
An examination of the political, socioeconomic and intellectual development of Latin America since the conclusion of World War II. Open to freshmen.

226 - HUMAN GEOGRAPHY
3.00 Credit(s)
An analysis of the elements of human geography, including cultures, cultural regions, race, language and religion, human population, movement, urbanization, and political organization. Open to freshmen. (Formerly PLSC 400.)

241 - POLICE IN AMERICA
3.00 Credit(s)
Historical, philosophical and legal basis of police institutions and procedures. The course is intended to be an issues course and discussion topics will vary with prevailing issues.

245 - CORRECTIONS IN AMERICA
3.00 Credit(s)
Historical, philosophical and legal basis of correctional procedures and institutions. The course is intended to be an issues course and the discussion topics will vary with prevailing issues.

291 - SPECIAL TOPICS IN POLITICAL SCIENCE
1.00 to 3.00 Credit(s)
Can be repeated as topic varies.
310 - AMERICAN URBAN HISTORY
3.00 Credit(s)
A study of the influence of the American city on American culture, and of the impact of American traditions on urban development, from colonial times to the present.

312 - URBAN POLITICS AND ADMINISTRATION
3.00 Credit(s)
An examination of urban governments, the problems they face, and the growing importance of professional urban administrators. Analysis of current federal policy as it affects urban America.

315 - THE WAR IN VIETNAM
3.00 Credit(s)
An examination of events leading to American military involvement in Vietnam, strategic decisions in waging the war, its effects in the United States, and the long-run consequences for national security policy and American politics.

334 - PARLIAMENTARY DEMOCRACIES
3.00 Credit(s)
A comparison of the politics of contemporary democracies, stressing the impact of political culture and the operations of governmental institutions, parties and interest groups in the process of public policy-making.

335 - AUTOCRATIC POLITICAL SYSTEMS
3.00 Credit(s)
A comparison of the politics of contemporary dictatorships, stressing the operations of the single-party control system, the role of leaders, of governing classes and elites, and governing agencies and ideological orientations.

336 - DEVELOPING POLITICAL SYSTEMS
3.00 Credit(s)
A comparison of contemporary politics in developing societies, stressing the impact of cultural fragmentation, modernization, social unrest and rising expectations on the stability and effectiveness of governmental institutions and processes.

341 - CRIMINAL LAW
3.00 Credit(s)
This course is intended to introduce and familiarize students with both substantive criminal law and the laws regarding the prosecution and incarceration of the criminally accused. During the course, students will critically analyze criminal liability, defenses to criminal culpability, the historical development of criminal law, and the limits of the criminal sanctions.

347 - POLITICAL PARTIES-INTEREST GROUPS-ELECTIONS
3.00 Credit(s)
An examination of the organization and activities of political parties and interest groups and their impact on the political process, especially their roles in election campaigns.

348 - AMERICAN CONSTITUTION 1
3.00 Credit(s)
A study of the social and political forces that shaped constitutional political theory and of the interaction of law and politics through the Reconstruction era.

349 - AMERICAN CONSTITUTION 2
3.00 Credit(s)
The adaptation of the original Constitution to twentieth century problems of economic regulation, civil rights, industrial liberation, the welfare state and the American Empire.

361 - RECENT AMERICAN HISTORY 1
3.00 Credit(s)
An intensive analysis of American history from the beginning of World War I until the conclusion of World War II.

362 - RECENT AMERICAN HISTORY 2
3.00 Credit(s)
An examination of the major social, economic, and political issues in American history since World War II.

363 - PUBLIC ADMINISTRATION AND POLITICS
3.00 Credit(s)
Bureaucrats as actors in the American political system. Their sources of power and their relationships to elected public officials. The problems of controlling bureaucracies.

371 - INTERNATIONAL RELATIONS
3.00 Credit(s)
An examination of the forces which determine the policies of the nation states and their organizations in the international setting.

387 - AMERICAN POLITICAL THOUGHT
3.00 Credit(s)
An examination of American political theory commencing with the colonial period and proceeding to modern political thinkers.

391 - SPECIAL TOPICS IN POLITICAL SCIENCE
1.00 to 3.00 Credit(s)
Can be repeated as topic varies.

421 - GOVERNMENT OF THE CIS
3.00 Credit(s)
An examination of the demographic, historical and ideological basis of Soviet rule, stressing the impact of culture and structure on governmental and social institutions as well as domestic and foreign policy-making and post Soviet development.
422 - FOREIGN POLICY OF THE CIS
3.00 Credit(s)
An examination of the forces that have shaped Russian and Soviet foreign policy to the present, considering the impact of Marxism-Leninism, internal conditions and foreign interference and the pattern of expansion and power consolidation.

424 - THE AMERICAN PRESIDENCY
3.00 Credit(s)
A study of the historical development and contemporary operation of the presidency. Topics discussed include presidential selection, congressional-presidential relations, management of the federal bureaucracy, executive decision-making, and presidential personality.

425 - THE AMERICAN CONGRESS
3.00 Credit(s)
An examination of the structure and operation of Congress; committees, rules and procedures, party organization, and executive oversight; contributions from the President, interest groups, public opinion, and the courts.

426 - THE AMERICAN LEGAL SYSTEM
3.00 Credit(s)
A political analysis of how justice is administered in American courts. The roles of lawyers, judges and juries are examined. The organization of American courts, both federal and state, is studied with attention directed to trials, appellate proceedings, and constraints on the courts.

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

436 - AMERICAN PUBLIC POLICY ANALYSIS
3.00 Credit(s)
An introduction to the basic dynamics and problems of the American policymaking process, as well as some of the more widely used analytical approaches to public policy.

441 - INTERNATIONAL LAW AND ORGANIZATIONS
3.00 Credit(s)
An examination of the structure, operation and legal setting of international organizations, with particular emphasis on the United Nations as well as regional institutions such as the European community.

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

452 - AMERICAN FOREIGN RELATIONS
3.00 Credit(s)
A conceptual review of the inception, development and contemporary interpretation of the major foreign policies of the United States.

455 - WESTERN POLITICAL THOUGHT 1
3.00 Credit(s)
An examination of Western political theory commencing with the ancient period (Plato, Aristotle, Cicero) and proceeding to Machiavelli.

456 - WESTERN POLITICAL THOUGHT 2
3.00 Credit(s)
An examination of Western Political theory commencing with the contract theorists (Rousseau, Locke, Hobbes) and proceeding to the age of the French Revolution (Burke).

457 - WESTERN POLITICAL THOUGHT 3
3.00 Credit(s)
An examination of Western political theory commencing with the early nineteenth century (Hegel) and proceeding to the twentieth century (Lenin, Nietzsche).

475 - UNITED NATIONS TODAY
3.00 Credit(s)
Prepares students to participate in the National Model United Nations in New York City. This is an integrated and serious simulation of many aspects of the United Nations. Students travel to New York City in the spring. Application to and approval of the departmental Model U.N. advisors are prerequisites for registering for this course. May be repeated 3 times for credit, but only 6 hours can count toward major or minor requirements.

476 - MOCK TRIAL
3.00 Credit(s)
Prepares students to participate in both the regional and national mock trial competition held at the University of Toledo and Drake University University, respectively. This course familiarizes students with the preparation of both civil and criminal cases including preparation and delivery of opening and closing statements, direct and cross-examination of witnesses, and preparation of objections. This course may be repeated a total of three times but only six hours may count toward departmental majors. Prerequisite: Permission of instructor.
481 - PUBLIC SERVICE INTERNSHIP PROGRAM
6.00 to 15.00 Credit(s)
Field experience in the area of public service. Selected students upon proper application, screening, and acceptance, will work in close relationship with public offices and officials. Those interns serving in a local agency would generally receive six quarter hours credit for approximately ten hours of service per week, while those interns serving in Columbus or Washington D.C. on a full-time quarterly basis, would generally receive fifteen hours credit.
Prerequisites: Consultation with the departmental internship committee and completion of the application process. A maximum of six hours will count toward major requirements.

488 - SENIOR RESEARCH PAPER 1
1.00 Credit(s)
Topic selection, development of bibliography and outline for senior paper (see PLSC 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, Political Science, Criminal Justice or International Studies.

489 - SENIOR RESEARCH PAPER 2
2.00 Credit(s)
Students will write a research paper directed by a department faculty member relevant to their major. Required of all departmental majors. Students should enroll in this course one quarter before the quarter in which they expect to graduate. Prerequisites: Senior status; major in History, Political Science, Criminal Justice or International Studies.

491 - SPECIAL TOPICS IN POLITICAL SCIENCE
1.00 to 3.00 Credit(s)
Can be repeated as topic varies.

495 - SEMINAR IN POLITICAL SCIENCE OR CRIMINAL JUSTICE
1.00 to 3.00 Credit(s)
Can be repeated as topic varies.

498 - INDEPENDENT STUDY IN POLITICAL SCIENCE, CRIMINAL JUSTICE OR INTERNATIONAL STUDIES
1.00 to 3.00 Credit(s)
Approval of department chairman required prior to registration.

DEPARTMENT OF INDUSTRIAL TECHNOLOGY

(Subject 142)

Associate Professors Devier (Chair); Rouch; Assistant Professor Shearow.

The course work comprising the curriculum in industrial 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 for either career path. The number of quarter hours in the major varies depending upon the career path selected. Those selecting the teacher certification route must complete all state and university requirements for certification. Those selecting the industry-bound path must complete an option/minor comprised of a minimum of 30 hours in one of the following: management, marketing, business, technical training, graphic communication, design analysis, or a specially selected option/minor.

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 six quarters (two summer and four normal quarters) of work experience, usually with the same company. The program is divided into two 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.

One minor is also available in industrial technology: consisting of 30 credit hours for industry-bound students in related majors.

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.
A senior project exhibition is required of each student majoring in the Department of Industrial Technology.

**Industrial Technology Major**
Orientation 000
Introduction to Industrial Technology 110
Materials and Processes 1 130
Materials and Processes 2 132
Microcomputer Applications in Industrial Technology 140
Computer-Assisted Drafting and Design 220
Computer-Assisted Construction Design 221
Computer-Assisted Product Design 223
Introduction to Communication Technology 240
Sophomore Seminar in Industrial Technology 294
Machining Technology 332
Casting and Fabricating Technology 333
Computer Automated Manufacturing 335
Introduction to Construction 350
Introduction to Energy/Power 360
Introduction to Transportation Technology 370
Introduction to Manufacturing Management 412
Materials and Processes 3 430
Product Manufacturing 431
Fundamentals of Electricity/Electronics 461
Quality Control and Work Measurement 470
Senior Seminar in Industrial Technology 494
Senior Project in Industrial Technology 495
Tour of American Industries 496

**Options/Minors (30 hours)**
An option or minor is required of all industrial technology-industry bound students. The six structured minors/options to choose from are as follows:

**Management:** (minor)
Economics 100
Accounting 231, 232, 233
Business Law 322
Managerial Finance 362
Principles of Management 330
Electives in Management 12 hours

**Business:** (option only)
Accounting 231, 232, 233
Business Law 322
Principles of Management 330
Managerial Finance 362
Marketing 351
Principles of Microeconomics 202
Electives in Business 6 hours

**Marketing:** (minor)
Economics 100
Accounting 231, 232, 233
Marketing 351
Business Law 322
Managerial Finance 362
Electives in Marketing 12 hours

**Graphic Communication:** (option only)
Advanced Graphic Communication 142-340
Technical Illustration 142-421
Journalism Layout & Design 112-246
Graphic Design I 151-222
Graphic Design II 151-223
Graphic Design III 151-224
Serigraphy 151-280
Lithography 151-370
Magazine Writing 112-243
Press/Freedom-Law 112-244
Ind. Study-Ind. Tech. 142-497

**Design Analysis:** (option only)
Physics: Mechanics of Solids & Fluids 124-231
Calculus 1 123-163
Calculus 2 123-261
Creative Design 201-114
Technical Illustration 142-421
Statics 201-311
Dynamics 201-312
Mechanics of Materials 1 201-313
Mechanics of Materials 2 204-401

**Technical Training:** (option only)
Psychology 133-100
Introduction to Education 141-110
First Aid and Safety 143-112
Technology and Society 142-200
Introduction to Technical Education 142-474
Nine hours elected from 202-301, 202-435, 201-103, 142-421, 142-341, 142-340, 142-231, 142-260, 142-462, 142-497

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 Industrial Technology.

**Internship**
All industrial technology-industry bound students (major or minor) are encouraged to complete 15 hours of Internship 142-484 in an industrial setting either during a summer(s) 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 provide the student with extensive experience. The outline of courses is as follows:
Cooperative Experience Orientation (280), winter of 2nd year
Co-op in Industrial Technology 1, 2, & 3 (281, 282, & 283), summer, fall, & winter after 2nd year
Co-op Experience Seminar 1 (285), spring of 3rd year
Co-op in Industrial Technology 4, 5, & 6 (481, 482, & 483), spring, summer, & fall of 4th and 5th years
Co-op Experience Seminar (485), spring of 5th year
Industrial Technology Minor (30 hours)
Students from other disciplines who desire to gain a basic introduction to industry may select a minor as follows:
- Materials and Processes 2132
- Introduction to Drafting and Design 220
- Introduction to Communication Technology 240
- Machining Technology 332
- Introduction to Construction 350
- Elective (minimum of nine hours credit) course selected from: 130, 140, 200, 221, 223, 260, 294, 333, 335, 340, 341, 360, 370, 412, 421, 430, 431, 461, 470, 490, 494, 495, 496, or 497.

Industrial Technology Teacher (K-12 or 7-12) Certification Major
Orientation 000
- Introduction to Industrial Technology 110
- Materials and Processes 1130
- Materials and Processes 2132
- Microcomputer Applications in Industrial Technology 140
- Computer-Assisted Drafting and Design 220
- Computer-Assisted Construction Design 221
- Computer-Assisted Product Design 223
- Introduction to Communication Technology 240
- Sophomore Seminar in Industrial Technology 294
- Machining Technology 332
- Casting and Fabricating Technology 333
- Computer-Automated Manufacturing 335
- Introduction to Construction 350
- Introduction to Energy/Power 360
- Introduction to Transportation Technology 370
- Materials and Processes 3430
- Product Manufacturing 431
- Fundamentals of Electricity/Electronics 461
- Student Teaching Seminar 491
- Senior Seminar in Industrial Technology 494
- Senior Project in Industrial Technology 495
- Tour of American Industries 496

All students pursuing professional education certification must complete the following courses:
- 142-210, 142-473, 141-110, 141-150, 141-225, 141-263, 141-342, 141-385, 141-475, and 141-480. (14 hours 7-12) or 141-470 (7 hours) and 141-480 (7 hours, K-12). (Psychology 100 is also required and may be part of the BS-BA general education courses.)

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:
- Technology and Society 142-200
- Custom Woodworking 142-231
- Auto Preventive Maintenance 142-260
- Advanced Graphic Comm. 142-340
- Photography 142-341
- Technical Illustration 142-421
- Digital Electronics: Concepts and Applications 142-462
- Introduction to Technical Education 142-474

000 - ORIENTATION
1.00 Credit(s)
An introduction to the department, introduction to college life. Familiarization with the basic curriculum options. Planning a course program. University student services. The library. The departmental major requirements. Required of all department majors.

110 - INTRODUCTION TO INDUSTRIAL TECHNOLOGY
3.00 Credit(s)
Introductory course for students majoring, minorning, or interested in the Department of Industrial Technology. An overview of the career path options offered by the department; industrial technology teaching or industrial technology-industry bound. An introduction to industrial technology with study of its major components, i.e., construction, manufacturing, communications, energy/power, transportation and servicing.

130 - MATERIALS AND PROCESSES 1
3.00 Credit(s)
The major-wood based industrial materials and their processing. An introduction to the conversion of basic (raw) once-living wood materials via processing into consumer products. Major emphasis on wood as an industrial material. (Formerly ITEC 460.)

132 - MATERIALS AND PROCESSES 2
3.00 Credit(s)
The major metallic industrial materials and their processing. An introduction to the conversion of basic (raw) materials via refining and processing into consumer products. Major emphasis on metallurgy of both ferrous and non-ferrous materials and the processes involved in layout, hot and cold working, heat treating, material testing and finishing.

140 - MICRO COMPUTER APPLICATIONS IN INDUSTRIAL TECHNOLOGY
3.00 Credit(s)
An introduction to operating micro computers and various software programs. Students will also be exposed to writing simple programs to control CNC machines and robots. No prior experience with computers is required.

190 - SPECIAL TOPICS IN INDUSTRIAL TECHNOLOGY
1.00 to 3.00 Credit(s)

200 - TECHNOLOGY AND SOCIETY
3.00 Credit(s)
A survey dealing with the major concepts of technology; its development, its effects on society, and the problems associated with it. Students will be required to critically evaluate these effects through written and verbal activities. Guest lectures will be an integral part of the class.
210 - TECHNOLOGY EDUCATION IN THE ELEMENTARY SCHOOL  
4.00 Credit(s)  
Introduction to the use of technology and technical activity at the elementary 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. A presentation of the rationale, materials, creative and manipulative activities. Typical problems and the planning and organizing of the learning environment.

220 - INTRODUCTION TO COMPUTER ASSISTED DRAFTING AND DESIGN  
3.00 Credit(s)  
An introduction to the technical graphics field and graphic representation using the personal computer. Consideration will be given to technical sketching, orthographic projection, pictorials, sections and conventions, auxiliary views and applied geometry.

221 - COMPUTER ASSISTED CONSTRUCTION DESIGN  
3.00 Credit(s)  
This course is a study of construction planning, design, engineering and layout. More specifically, this course deals with basic residential planning, light construction principles, architectural details, plot surveying and layout, creation of architectural working drawings on personal computer CADD software, and other related information.

223 - COMPUTER ASSISTED PRODUCT DESIGN  
3.00 Credit(s)  
This course emphasizes the use of the personal computer in the drafting and design process to generate designs for manufactured products. A special emphasis will be placed on the design process and the components/variables of good design. Students will be involved in developing designs, giving technical oral presentations, analyzing products through solids modeling and through prototype development.

231 - CUSTOM WOODWORKING  
3.00 Credit(s)  
An introduction to basic processes, tools, and materials employed in the production of custom, individually designed, and crafted wood products.

240 - INTRODUCTION TO COMMUNICATION TECHNOLOGY  
3.00 Credit(s)  
The history of communication technologies, present day procedures, and the machinery, equipment, and materials that are associated with them; including the fundamentals of reproduction layout, design, and composition, relief, lithography, screen, and duplicating processes, finishing and binding, and electronic media and methods.

260 - AUTOMOTIVE PREVENTATIVE MAINTENANCE  
3.00 Credit(s)  
General automotive maintenance and servicing geared towards the automobile owner/operator. Topics covered include: automotive tune-up, trouble shooting, seasonal adjustments, and preventative maintenance scheduling.

280 - COOPERATIVE EXPERIENCE ORIENTATION  
1.00 Credit(s)  
Cooperative Experience Orientation is intended to prepare the industrial technology co-op student to begin the 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 industrial technology majors with preliminary acceptance in the co-op program. Graded S/U.

281 - CO-OP IN INDUSTRIAL TECHNOLOGY 1  
1.00 Credit(s)  
Co-op in Industrial Technology is designed to provide the student the opportunity for study and experience outside the traditional campus setting via employment with an industrial enterprise. The student is expected to function as an effective employee while gaining valuable insight and experience related to his/her chosen field. The student is supervised and must submit a written co-op report. Graded S/U. Prerequisite: ITEC 280.

282 - CO-OP IN INDUSTRIAL TECHNOLOGY 2  
1.00 Credit(s)  
Continuation of ITEC 281. Prerequisite: ITEC 281.

283 - CO-OP IN INDUSTRIAL TECHNOLOGY 3  
1.00 Credit(s)  
Continuation of ITEC 282. Prerequisite: ITEC 282.

285 - CO-OP EXPERIENCE SEMINAR 1  
1.00 Credit(s)  
Co-op Experience Seminar ITEC 285 is a follow up course to the student's first co-op placement. The total experience will be reviewed in a structured format of written and oral reports. Graded S/U. Prerequisite: ITEC 283.

290 - SPECIAL TOPICS IN INDUSTRIAL TECHNOLOGY  
1.00 to 3.00 Credit(s)

294 - SOPHOMORE SEMINAR IN INDUSTRIAL TECHNOLOGY  
1.00 Credit(s)  
Required of all industrial 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. The course meets one hour per week and is graded. Prerequisite: department major and 5 quarters' work.
332 - MACHINING TECHNOLOGY
5.00 Credit(s)
Machining practices primarily used for the separating of metallic materials will be emphasized. A variety of machine tools will be used in the instruction and lab activities with nontraditional machining techniques (EDM, LASER, etc.) and machine controls (NC, CNC) considered.

333 - CASTING AND FABRICATING
5.00 Credit(s)
Pattern making, molding, and casting of various materials. Casting techniques will include non-ferrous materials. Survey of principles and practices of fabricating materials. Emphasis on welding operations including MIG, TIG, SMAW, resistance, and oxy-acetylene. Mechanical fasteners and adhesives.

335 - COMPUTER AUTOMATED MANUFACTURING
3.00 Credit(s)
Introduction to Computer Automated Manufacturing. Topics include design process to production with automated production machines, materials handling equipment, control systems, numerical control, and robotics.

340 - ADVANCED GRAPHIC COMMUNICATIONS
3.00 Credit(s)
Study of advanced offset lithography processes including line and half tone process camera work, stripping of negatives to produce flats, platemaking, and press operations. Simple signature layout, binding and finishing are also covered. Advanced study in silk screen and relief processes will be designed for students with special interests. Prerequisite: ITEC 240 or equivalent.

341 - PHOTOGRAPHY
3.00 Credit(s)
Techniques of photographic composition, camera types, uses and accessories, photographic optics, and laboratory methods and materials; dark room developing and printing; color photography.

350 - INTRODUCTION TO CONSTRUCTION
5.00 Credit(s)
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.

360 - INTRODUCTION TO ENERGY/POWER
5.00 Credit(s)
Concepts of power generation, transmission, and conversions. Internal and external combustion convertors, steam, atomic, solar, wind, geothermal, hydro, and other energy principles and devices. Methods of maintaining and repairing energy conversion and transmission units.

370 - INTRODUCTION TO TRANSPORTATION TECHNOLOGY
2.00 Credit(s)
Resources, technical processes, and the efficient development and design of the various modes of transportation utilized by industry. A focus will be placed on the major components of transportation systems such as propulsion, guidance, suspension, control, support, and structure systems used in stationary and vehicular systems.

390 - SPECIAL TOPICS IN INDUSTRIAL TECHNOLOGY
1.00 to 3.00 Credit(s)

412 - INTRODUCTION TO MANUFACTURING MANAGEMENT
3.00 Credit(s)
The basic introduction to manufacturing planning, organizing, controlling and directing. Major topics include productivity, management foundational concepts, manufacturing enterprise organization, design of facilities and processes, equipment selection and maintenance, materials handling inventory control, purchasing and safety.

421 - TECHNICAL ILLUSTRATION
2.00 Credit(s)
Techniques of illustration for mechanical and architectural drawing. Activities in the use of shading mediums of graphite and ink will be covered including stippling, line shading, texture boards, and airbrush rendering. Prerequisite: ITEC 220 or equivalent.

430 - MATERIALS AND PROCESSES 3
3.00 Credit(s)
Contemporary industrial materials and their processing. An introduction to the conversion of basic (raw) materials via refining and processing into consumer products. Major emphasis on plastics, with ceramics, composites, fibers, fabrics, leathers and others addressed to a lesser degree.

431 - PRODUCT MANUFACTURING
3.00 Credit(s)
Machine operations in the manufacture of various types of products with special emphasis on wood product manufacturing. Emphasis will be placed on process design, material handling, organization of work, division of labor, etc. relating to mass production industries. A major line production will be completed by each class. Prerequisite: ITEC 222 or equivalent.

461 - FUNDAMENTALS OF ELECTRICITY AND ELECTRONICS
5.00 Credit(s)
The principles of electricity and electronics applied to the areas of power utilization and communications will be emphasized. The operation of various electrical and electronics devices will also be covered.
462 - DIGITAL ELECTRONICS: CONCEPTS AND APPLICATIONS
4.00 Credit(s)
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: ITEC 461.

470 - QUALITY CONTROL AND WORK MEASUREMENT
3.00 Credit(s)
A survey course of 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.

473 - ORGANIZATION AND METHODS OF TEACHING INDUSTRIAL TECHNOLOGY
4.00 Credit(s)
A professional course in the organization and methods of teaching industrial technology. Philosophical constructs, organizing courses, program and course objectives, preparing lesson plans and industrial materials, laboratory procedures, and administrative practices. Opportunity to conduct micro-teaching units. Includes approximately 30 hours of field experience. Prerequisite: 30 hours or more of industrial technology courses.

474 - INTRODUCTION TO TECHNICAL EDUCATION
4.00 Credit(s)
Elements of instruction, instructional scope and sequence, development of training programs, and planning, organizing, and administering technical laboratories for students planning on careers in teaching/training in industry and vocational/technical secondary and postsecondary schools. Required for Technical Training Option.

481 - CO-OP IN INDUSTRIAL TECHNOLOGY 4
1.00 Credit(s)
Co-op in Industrial Technology is designed to provide the student the opportunity for study and experience outside the traditional campus setting via employment with an industrial enterprise. The student is expected to function as an effective employee while gaining valuable insight and experience related to his/her chosen field. The student is supervised and must submit a written co-op report. Graded S/U. Prerequisites: ITEC 285.

482 - CO-OP IN INDUSTRIAL TECHNOLOGY 5
1.00 Credit(s)
Continuation of ITEC 481. Prerequisite: ITEC 481.

483 - CO-OP IN INDUSTRIAL TECHNOLOGY 6
1.00 Credit(s)
Continuation of ITEC 482. Prerequisite: ITEC 482.

484 - INTERNSHIP IN INDUSTRIAL TECHNOLOGY
5.00 to 15.00 Credit(s)
The industrial technology internship provides qualified students with a supervised program of experiences in production practices, management techniques, research applications, and other activities representative of modern industry. Selected students upon proper application, screening, and acceptance by an appropriate industry will pursue either 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. It will be graded S-U and a student may only use a maximum of fifteen hours to count toward graduation. Co-requisite: ITEC 492.

485 - CO-OP EXPERIENCE SEMINAR 2
1.00 Credit(s)
Co-op Experience Seminar ITEC 485 is a follow up course to the student's second co-op placement. The total experience will be reviewed in a second structured format of written and oral reports. Graded S/U. Prerequisite: ITEC 483.

490 - SPECIAL TOPICS IN INDUSTRIAL TECHNOLOGY
1.00 to 3.00 Credit(s)

491 - STUDENT TEACHING SEMINAR
1.00 Credit(s)
The student teaching seminar is required and is to be taken concurrently with student teaching and is in addition to Education Department seminar EDUC 475. The seminar is intended to reinforce field experiences as well as develop insights into implementation of recent curriculum development in Technology Education. Corequisites: EDUC 470 and/or 480.

492 - INTERNSHIP SEMINAR
1.00 Credit(s)
Corequisite with Internship in Industrial Technology ITEC 484 which provides for a structured method for weekly review and evaluation of the internship experience. Prerequisites: junior standing and industrial technology major. Graded S/U. Co-requisite: ITEC 484.
ics 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 Mathematics 105 is determined by the departmental placement test and requires permission of the department chair. Students whose ACT in mathematics is below 16 (SAT below 370) usually need to take this course before enrolling in any other mathematics course.

Students who want an introduction to computing should take either Introduction to Information Processing (CS 130), which is of general interest, or Introduction to Programming (CS 134). For a greater exposure to programming either the sequence 134-135 or 134-135-138 should be taken. Programming courses in FORTRAN (CS 230) and COBOL (CS 231) are also available.

All courses in the department which are to be counted toward a major or minor in either mathematics or computer science must be completed with a grade of "C" or better. A "D" in a cognate course is acceptable.

Mathematics

For the mathematics major, the student must complete the calculus sequence 163-261-262-263, Mathematics 272, 294, 311, 361, 452, 492, 493 and at least 12 credit hours in mathematics courses at the 300/400 level. Computer Science 134 is a required cognate course. For a minor in mathematics, the student must complete 163-261-262-272-294 plus 3 additional courses (each 3 credit hours or more) in mathematics numbered 245 or higher.

Students planning to pursue a graduate degree in mathematics should also take 312, 313, 324, 363, and 453. Students interested in a career in the actuarial sciences should also take 332, 381, 382, 461, and 462, as well as 202, 203, 231, 232 and 233 from the College of Business Administration.

000 - ORIENTATION
1.00 Credit(s)
Familiarization with the department, requirements for majors planning programs of study, University catalog and library.

105 - INTERMEDIATE ALGEBRA
3.00 Credit(s)
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 than 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 - ELEMENTARY FUNCTIONS 1
4.00 Credit(s)
Real number system, functions, theory of polynomial equations, systems of equations and inequalities. 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 or satisfactory performance on the mathematics placement examination.

122 - ELEMENTARY FUNCTIONS 2
3.00 Credit(s)
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 - PROBABILITY AND STATISTICS 1
3.00 Credit(s)
Descriptive statistics, probability, binomial distribution, normal distribution, confidence intervals, hypothesis testing.

143 - PROBABILITY AND STATISTICS 2
3.00 Credit(s)
Chi-square tests, analysis of variance, non-parametric statistics, decision making under uncertainty, the classical time series model, index numbers; oriented toward business applications. Prerequisite: MATH 142 or equivalent.

154 - INTRODUCTION TO CALCULUS 1
4.00 Credit(s)
Concepts of differentiation and integration applied to algebraic, exponential, and logarithmic functions. Prerequisite: MATH 120 or equivalent.

155 - INTRODUCTION TO CALCULUS 2
4.00 Credit(s)
Additional topics in integration, functions of several variables, elementary differential equations, and probability. Prerequisite: MATH 154 or equivalent.

156 - INTRODUCTORY DATA ANALYSIS
4.00 Credit(s)
Basic statistical techniques with emphasis on the applications to biological sciences. Prerequisite: MATH 155 or equivalent.
DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

(Department 123)

Subject - Mathematics (MATH)

Professors Berton, Hovis (Chair), Lhamon, Shult; Associate Professors Evans, Putt, Retterer, Roepeke; Assistant Professors K. Boyadzhiev, Hudak, Johns; Visiting Assistant Professor Yeomans; Lecturers I. Boyadzhiev, Dwyer

Mary Reichelderfer Chair of Mathematics and Computer Science established in 1983 from funds of the estate of Mary K. Werkman. The 1992-93 recipient of this chair is Tena Roepeke, associate professor of mathematics.

The department offers majors and minors in both mathematics and computer science as well as courses in mathematics, statistics, and computer science to complement almost all disciplines in the University. Students with 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 and Certification in program planning for certification for those desiring to teach at the secondary school level. Students should consult with the department in which they are considering a major to determine the best choice of courses in mathematics and computer science.

In general, the sequence 171-172-173 is designed for prospective elementary school teachers, 142-143 for social science and business students, 154-155-156 for life science students and 163-261-262-263 for students in engineering, the physical sciences, mathematics and computer science. Mathematics 272 should be of interest to students in many areas.

Mathematics 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. Mathematics 160, precalculus, is designed to provide a fast-paced review of the material contained in 120 and 122. The student who needs intensive skill development before taking calculus should take 120 and 122; the student who needs only a review should take 160.

Mathematics 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 mathematic-
160 - PRE-CALCULUS MATHEMATICS
5.00 Credit(s)
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 Credit(s)
Limit of a function, continuity, the derivative, extrema, curve plotting, Mean Value Theorem, applications of the derivative. Prerequisite: MATH 160 or equivalent.

171 - MATHEMATICS FOR ELEMENTARY TEACHERS
3.00 Credit(s)
Problem solving skills and techniques. Introduction to micro-computer programming; fundamentals of counting, probability, and statistics. OPEN ONLY TO ELEMENTARY EDUCATION MAJORS.

172 - FUNDAMENTAL MATHEMATICS 1
3.00 Credit(s)
Theory of arithmetic, systems of numeration, relations, algorithms, whole numbers, integers, rational numbers, real numbers, patterns of proof. OPEN ONLY TO ELEMENTARY EDUCATION MAJORS.

173 - FUNDAMENTAL MATHEMATICS 2
3.00 Credit(s)
LOGO geometry, geometric figures, constructions, symmetry, similarity, congruence and concepts of measurement. OPEN ONLY TO ELEMENTARY EDUCATION MAJORS.

190 - SPECIAL TOPICS IN MATHEMATICS
1.00 to 3.00 Credit(s)

245 - HISTORY OF MATHEMATICS
3.00 Credit(s)
An introduction to the history and origin of mathematics, restricted principally to mathematics through elementary calculus, a chronological study of some mathematicians and their contributions to mathematical thought. Offered alternate years.

261 - CALCULUS 2
4.00 Credit(s)
The Fundamental Theorem of Calculus, applications of the integral, the exponential function and inverse functions, techniques of integrations. Prerequisite: MATH 163.

262 - CALCULUS 3
4.00 Credit(s)
Sequences and series, Taylor series, polar coordinates, parametric equations, conic sections, vectors, planes and lines in space. Prerequisite: MATH 261.

263 - CALCULUS 4
4.00 Credit(s)
Vector-valued functions, multivariate functions, spherical and cylindrical coordinates, differential calculus of multivariate functions, integral calculus of multivariate functions. Prerequisite: MATH 262.

272 - INTRODUCTION TO LINEAR ALGEBRA
4.00 Credit(s)
Vector space methods. Vector spaces over the Reals, linear transformations and their matrices, eigenvalues and eigenvectors. Applications. Prerequisites: MATH 262 or consent of the instructor.

290 - SPECIAL TOPICS IN MATHEMATICS
1.00 to 4.00 Credit(s)

294 - FOUNDATIONS OF MATHEMATICS
4.00 Credit(s)
Introduction to sets, logic and mathematical proof; application of these concepts. Prerequisite: MATH 261.

301 - MATHEMATICS FOR SECONDARY TEACHERS
4.00 Credit(s)
Includes topics related to number systems, theory of equations, functions, inequalities, geometry, number theory, etc. Emphasis on Euclidean geometry and LOGO and on discussions of actual questions raised in a secondary mathematics classroom, including discussion of appropriate teaching tactics. THIS COURSE WILL NOT COUNT TOWARD THE MAJOR IN MATHEMATICS. Offered alternate years. Prerequisite: MATH 294.

310 - INTRODUCTION TO NUMBER THEORY
4.00 Credit(s)
Introduction to number theoretic concepts including divisibility and primes, properties of congruences, quadratic reciprocity, arithmetic function, Diophantine equations, Gaussian
integers, arithmetic in quadratic fields. Prerequisite: MATH 294 or permission of instructor. Offered alternate years.

311 - ABSTRACT ALGEBRA 1
4.00 Credit(s)
Introduction to algebraic structures, groups, rings and fields. Prerequisite: MATH 294.

312 - ABSTRACT ALGEBRA 2
4.00 Credit(s)
Continuation of MATH 311. Offered alternate years.

313 - ADVANCED LINEAR ALGEBRA
4.00 Credit(s)
Finite and infinite dimensional vector spaces over a field, linear transformations, inner product spaces, and canonical forms. Offered alternate years. Prerequisite: MATH 272 and 311.

324 - TOPOLOGY
3.00 Credit(s)
General point set topology and metric spaces. Offered alternate years. Prerequisites: MATH 262 and 294.

332 - OPERATIONS RESEARCH
3.00 Credit(s)
Introduction to 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. Prerequisite: MATH 272.

336 - DISCRETE MATHEMATICS
4.00 Credit(s)
Introduction to and application of topics from mathematics relevant to computer science; combinatorics, relations, digraphs, trees, and elementary algebraic structures. Offered alternate years. Prerequisite: CS 135; MATH 272 and 294.

361 - DIFFERENTIAL EQUATIONS
5.00 Credit(s)
First order differential equations with applications; second order linear differential equations with applications. Laplace transforms, systems of first order equations. Prerequisites: MATH 262 and 272.

362 - PARTIAL DIFFERENTIAL EQUATIONS
4.00 Credit(s)
Fourier series, heat and wave equations, boundary conditions of classical types, Sturm-Liouville problem, series solution of ordinary differential equations. Offered alternate years. Prerequisite: MATH 361.

363 - COMPLEX VARIABLES
4.00 Credit(s)
Complex algebra, complex calculus, analytic functions, infinite series over the complex plane, theory of residues, conformal mapping. Offered alternate years. Prerequisite: MATH 263.

381 - STATISTICS 1
4.00 Credit(s)
Probability models, random variables, sampling estimation, hypotheses testing, non-parametric procedures, regression, and correlation. Prerequisite: MATH 263.

382 - STATISTICS 2
4.00 Credit(s)
Continuation of MATH 381.

390 - SPECIAL TOPICS IN MATHEMATICS
1.00 to 4.00 Credit(s)

421 - FOUNDATIONS OF GEOMETRY 1
3.00 Credit(s)
Incidence, ordering, separation and congruence as they are involved in non-Euclidean geometries; incidence, affine and Euclidean geometries. Offered alternate years. Prerequisite: MATH 294.

422 - FOUNDATIONS OF GEOMETRY 2
3.00 Credit(s)
Continuation of MATH 421. Offered alternate years.

423 - PROJECTIVE GEOMETRY
3.00 Credit(s)
Projectivities, perspective triangles, quadrangular sets, harmonic sets, duality, fundamental theorem and Pappus's Theorem, polarities, the conic, finite projective plane, parallelism, coordinates. Offered alternate years. Prerequisite: MATH 294.

440 - ADVANCED ENGINEERING MATHEMATICS
3.00 Credit(s)
Vector analysis, Fourier series, functions from Rm to Rn, Taylor series of multivariable functions, and special functions. Applications. Prerequisite: MATH 361.

452 - REAL ANALYSIS 1
4.00 Credit(s)
Basic set theory, algebraic and topological properties of real Cartesian spaces, sequences. Prerequisites: MATH 263 and 294.
453 - REAL ANALYSIS 2
4.00 Credit(s)
Continuous functions in real Cartesian spaces, theory of functions of one variable (differentiation and integration). Offered alternate years. Prerequisite: MATH 452.

461 - NUMERICAL ANALYSIS 1
4.00 Credit(s)
Solutions of equations in one variable, interpolation and polynomial approximation, direct methods for solution of linear systems. Offered alternate years. Prerequisites: CS 138 or MATH 230; MATH 262 and 272.

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

490 - SPECIAL TOPICS IN MATHEMATICS
1.00 to 4.00 Credit(s)

492 - SENIOR MATHEMATICAL EXPOSITION 1
1.00 Credit(s)
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(s)
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 Credit(s)

497 - INDEPENDENT STUDY IN MATHEMATICS
1.00 to 4.00 Credit(s)

Subject - Computer Science (CS)

For the computer science major, the student must complete the following computer science courses: 134, 135, 138, 234, 236, 238, 330, 334, 338, 429, 430, 434, and one of the following sets of courses: Math 262, CS 230, CS 461 or CS 231, CS 331.

In addition, the student is required to complete two courses (each three credit-hours or more) in computer science electives at the 300/400 level (Computer Graphics 204-444 may be used as one of the courses in satisfying this requirement.) The computer science major must also complete the following cognates:

**Mathematics Component**
- 163, 261, 272, 294, 336, and one of the following sets of courses:
  - Math 142 Probability and Statistics 1
  - Math 143 Probability and Statistics 2
  - Math 156, Introduction to Data Analysis
  - Math 361 Statistics 1
  - Math 382 Statistics 2

**Science Component**
The student is required to complete one of the following sequences of courses:
- Biology 121, 122, 123
- Chemistry 171, 172, 173
- Physics 231 + 234, 232 + 235, 233 + 236

For the computer science minor, the student must complete CS 134, 135, 138, and at least one of CS 234, 236 or 238. The student must then complete at least four additional courses (3 credit hours or more) in computer science. Two of these must be at the 300/400 level and the total must be at least 30 hours. ME 444 will count as an elective.

000 - ORIENTATION
1.00 Credit(s)
Familiarization with the department, requirements for majors, planning programs of study, University catalog and library.

130 - INTRODUCTION TO INFORMATION PROCESSING
4.00 Credit(s)
An introduction to the language, technology, techniques, and applications of information processing; a discussion of these topics and their place in the world of information; an introduction to the use of word processing, spreadsheet and database management software.

134 - INTRODUCTION TO PROGRAMMING
4.00 Credit(s)
An introduction to problem solving and algorithm development using a block structured language. Design, code, debug, and document computer programs using techniques of good programming style.

135 - INTERMEDIATE PROGRAMMING
4.00 Credit(s)
Continued development of discipline in program design, in style and expression, in debugging and testing, especially for larger programs.
138 - PROGRAMMING ENVIRONMENTS
4.00 Credit(s)
Introduction to software tools and operating system utilities available under popular operating systems such as UNIX. Introduction to the basic features of a systems programming language such as "C". Libraries of source and object code will be utilized. Prerequisite: CS 135.

191 - SPECIAL TOPICS IN COMPUTER SCIENCE
1.00 to 3.00 Credit(s)

230 - FORTRAN PROGRAMMING
4.00 Credit(s)
An introduction to the FORTRAN 77 language with an emphasis on using it for problem solving in mathematics, science, and engineering. Not open to students who have credit for GE 122. Offered alternate years.

231 - INTRODUCTION TO COBOL
4.00 Credit(s)
An introduction to programming in COBOL with business applications. Offered alternate years.

234 - ASSEMBLY LANGUAGE PROGRAMMING
4.00 Credit(s)
Introduction to computer structure and machine language, assembly language programming, macros, program segmentation and linkage. Prerequisite: CS 138.

236 - INTRODUCTION TO COMPUTER ORGANIZATION
4.00 Credit(s)
Introduction to computer architecture; basic logic design. Prerequisite: CS 138.

238 - INTRODUCTION TO FILE PROCESSING
4.00 Credit(s)
Introduction to file processing environment; sequential and direct access file manipulation techniques. Prerequisite: CS 138.

291 - SPECIAL TOPICS IN COMPUTER SCIENCE
1.00 to 4.00 Credit(s)

330 - ORGANIZATION OF PROGRAMMING LANGUAGES
4.00 Credit(s)

Theoretical investigation of programming language constructs; illustration of construct implementation in popular programming languages. Offered alternate years. Prerequisite: CS 234.

331 - ADVANCED COBOL
4.00 Credit(s)
Through the use of the COBOL programming language students are exposed to file organizations. They are introduced to advanced file processing techniques and to the fundamentals of database management. Offered alternate years. Prerequisite: CS 231.

332 - OPERATIONS RESEARCH
3.00 Credit(s)
Introduction to 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. Prerequisite: MATH 272.

334 - OPERATING SYSTEMS AND COMPUTER ARCHITECTURE 1
4.00 Credit(s)
Operating system principles; organization and architecture of computer systems at the register-transfer and programming levels of system development. Prerequisites: CS 234 and 236.

335 - OPERATING SYSTEMS AND COMPUTER ARCHITECTURE 2
4.00 Credit(s)
Continuation of CS 334. Offered alternate years. Prerequisite: CS 334.

338 - DATA STRUCTURES AND ALGORITHM ANALYSIS
4.00 Credit(s)
Basic techniques for the design and analysis of efficient algorithms for sorting, merging, searching and memory management. Prerequisite: CS 238.

341 - ARTIFICIAL INTELLIGENCE 1
4.00 Credit(s)
Introduction to 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.
342 - ARTIFICIAL INTELLIGENCE 2
4.00 Credit(s)
Continuation of CS 341. Offered alternate years. Prerequisite: CS 341.

345 - COMPUTER SIMULATION
4.00 Credit(s)
The nature of simulation, discrete event simulation, model structure, the process concept, the resource concept, performance measurements, the representation of time, random variables, entities, attributes, and sets. A modern discrete event simulation language such as Simscript II.5 will be used. Prerequisite: Knowledge of one programming language and basic statistics.

391 - SPECIAL TOPICS IN COMPUTER SCIENCE
1.00 to 3.00 Credit(s)

429 - SENIOR PROJECT DEFINITION
1.00 Credit(s)
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 430 Senior Project course.

430 - SENIOR PROJECT IN COMPUTER SCIENCE
4.00 Credit(s)
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.

434 - SOFTWARE ENGINEERING
4.00 Credit(s)
A study of methodologies used to design, create, evaluate and maintain software systems. The study includes coverage of several modern methodologies with emphasis on one. A course project written in a modern software development environment will be developed. Prerequisite: CS 135.

461 - NUMERICAL ANALYSIS 1
4.00 Credit(s)
Solution of equations in one variable; interpolation and polynomial approximation; direct methods for solution of linear systems. (Also listed as MATH 461.) Prerequisites: CS 138 or 230; MATH 262 and 272. Offered alternate years.

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

470 - COMPUTER SCIENCE INTERNSHIP
3.00 to 12.00 Credit(s)
Analysis, design, coding, or testing of a software project. Normally achieved off-campus working for an industrial organization or government agency. Open to computer science majors who have completed eight quarters of work and have junior standing.

491 - SPECIAL TOPICS IN COMPUTER SCIENCE
1.00 to 4.00 Credit(s)

495 - SEMINAR IN COMPUTER SCIENCE
1.00 to 4.00 Credit(s)

498 - INDEPENDENT STUDY IN COMPUTER SCIENCE
1.00 to 4.00 Credit(s)

DEPARTMENT OF MUSIC

(Professorson,
    E. Williams (Chair); Assistant Professors Kratz, D'Arca; Instructor Adkins;
    Lecturers Barron, Beckett, Biddinger, Dyke, Fisher, Gramm, McAllister, Nott, Sherrick, Suman, Osbun, R. Williams, Zickafoose)

The department of music offers a full course of music and music education studies for the aspiring music educator, composer, 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, and composition; 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:

**Fine Arts:** an art course, a theatre course, and Speech 100; **Humanities:** English 110, 111 and 204, Philosophy 100 or equivalent 102, Religion 105 or equivalent; **Foreign Language:** two quarters of any foreign language; **Social Sciences:** a course in Economics, Psychology, Sociology, or Political Science; Western Civilization: 110-111; **Mathematics and Natural Sciences:** a course in Biology and a physical science course. Also exposure to computer usage and at least one non-Western or 3rd world course. All students are required to take three hours of physical education credit (see Department of Health and Physical Education and Sports Studies).

All majors include a basic musicality core of courses: 121, 122, 123, 131, 132, 133, 221, 222, 223, 231, 232, 233, 241, 311, 312, 313, 321, 322, 323, 342 and 343. Vocal majors also take diction 261, 262, 263.

A minimum of one major performing group is taken each quarter. Regular student recital performances and participation in performing group concerts provide continuous growth in musicianship. Special requirements for the individual majors within the Bachelor of Music are as follows:

**The Bachelor of Music with a music education major** requires 22 hours of applied private instruction, proficiency in piano and guitar; senior recital; music education courses 043, 334, 336, 338, 339, 361, 461, and 462 (instrumental majors also take 463); and professional education courses 110, 150 twice, 225, 263, 285, 342, 450, 475, student teaching (one quarter), and field experience 300 hours.

The **Bachelor of Music with a performance major** requires an acceptance audition, piano proficiency, 36 hours of applied private instruction, applied field literature, ensemble, music electives, and junior and senior recitals.

The **Bachelor of Music with a composition major** requires 18 hours of music composition, 4 hours of electronic music and a 3 hour senior composition project. In addition, required supportive courses in music include music 100, 241, 342, 343, 12 hours of a primary applied instrument, 6 hours of a secondary applied instrument, 6 hours of piano, 12 hours of ensemble and 18 hours of music electives.

**Bachelor of Arts**
The candidate for the Bachelor of Arts degree must complete the bachelor of arts general education requirements listed earlier in this catalog. The major in music course sequence is comprised of music 100, 121, 122, 123, 131, 132, 133, 221, 222, 223, 231, 232, 233, 321, 322, 323; a minimum of 12 hours of private applied instruction well distributed over the college years; a minimum of six quarters in a major performing group; eight hours of music electives, and a senior project.

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

The advanced music section of the Graduate Record Examination (GRE) is the required senior comprehensive examination for all music majors. This exam must be taken before the last quarter of the senior year.

**Teacher certification in music, vocal and instrumental, K-12,** is acquired through the Bachelor of Music major in music education.

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

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

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

**Note:**
1. All class instruction carries one hour credit per quarter. The amount of instruction depends upon the size of the class, but is not less than one-half nor more than two class hours per week.
2. Individual instruction is offered for varying hours of credit. The section number will determine the number of hours credit. Usually, two hours for majors and one hour for minors are taken. Generally, one half hour of individual instruction is given for each hour of credit taken.
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:
- **Fine Arts**: an art course, a theatre course, and Speech 100; **Humanities**: English 110, 111 and 204, Philosophy 100 or equivalent 102, Religion 105 or equivalent; **Foreign Language**: two quarters of any foreign language; **Social Sciences**: a course in Economics, Psychology, Sociology, or Political Science; Western Civilization: 110-111; **Mathematics and Natural Sciences**: a course in Biology and a physical science course. Also exposure to computer usage and at least one non-Western or 3rd world course. All students are required to take three hours of physical education credit (see Department of Health and Physical Education and Sports Studies).

All majors include a basic musicality core of courses: 121, 122, 123, 131, 132, 133, 221, 222, 223, 231, 232, 233, 241, 311, 312, 313, 321, 322, 323, 342 and 343. Vocal majors also take diction 261, 262, 263.

A minimum of one major performing group is taken each quarter. Regular student recital performances and participation in performing group concerts provide continuous growth in musicianship. Special requirements for the individual majors within the Bachelor of Music are as follows:

The **Bachelor of Music with a music education major** requires 22 hours of applied private instruction, proficiency in piano and guitar; senior recital; music education courses 043, 334, 336, 338, 339, 361, 461, and 462 (instrumental majors also take 463); and professional education courses 110, 150 twice, 225, 263, 285, 342, 450, 475, student teaching (one quarter), and field experience 300 hours.

The **Bachelor of Music with a performance major** requires an acceptance audition, piano proficiency, 36 hours of applied private instruction, applied field literature, ensemble, music electives, and junior and senior recitals.

The **Bachelor of Music with a composition major** requires 18 hours of music composition, 4 hours of electronic music and a 3 hour senior composition project. In addition, required supportive courses in music include music 100, 241, 342, 343, 12 hours of a primary applied instrument, 6 hours of a secondary applied instrument, 6 hours of piano, 12 hours of ensemble and 18 hours of music electives.

**Bachelor of Arts** The candidate for the Bachelor of Arts degree must complete the bachelor of arts general education requirements listed earlier in this catalog. The major in music course sequence is comprised of music 100, 121, 122, 123, 131, 132, 133, 221, 222, 223, 231, 232, 233, 321, 322, 323; a minimum of 12 hours of private applied instruction well distributed over the college years; a minimum of six quarters in a major performing group; eight hours of music electives, and a senior project.

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

The advanced music section of the Graduate Record Examination (GRE) is the required senior comprehensive examination for all music majors. This exam must be taken before the last quarter of the senior year.

**Teacher certification in music, vocal and instrumental, K-12**, is acquired through the Bachelor of Music major in music education.

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

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

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

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

Membership in performing groups is open to all University students, and they are encouraged to participate. Students may enroll as many times as they wish; however, there are certain restrictions on the amount of ensemble credit which may count toward minimal graduation requirements in the College of Arts and Sciences. 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(s)
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(s)
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(s)
Select show choir ensemble of singer/dancers performing characteristic literature including Broadway, pop, vocal jazz and country-western. Performances include concerts and programs on and off campus. Membership by audition.

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

084 - WIND ENSEMBLE
1.00 Credit(s)
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(s)
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(s)
A band specially organized to provide music for athletic events.

087 - SYMPHONIC BAND
1.00 Credit(s)
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(s)
Selected ensembles for the study and performance of jazz and popular music. Performances on and off campus are scheduled throughout the year. Membership priority is given to members of symphonic and concert bands.

089 - OPERA WORKSHOP
1.00 to 3.00 Credit(s)
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(s)
A musical organization devoted to the preparation and performance of football game shows at home and selected away games. Open to all University students who play band instruments or who are accepted for auxiliary groups. Fall Quarter only. Includes a drill camp in advance of the Fall Quarter.

092 - WOODWIND ENSEMBLE
1.00 Credit(s)
Selected ensembles of woodwind instrumentalists for the study and performance of characteristic literature.

094 - BRASS ENSEMBLE
1.00 Credit(s)
Selected ensembles of brass instrumentalists for the study and performance of characteristic literature.
095 - PERCUSSION ENSEMBLE
1.00 Credit(s)
Selected ensembles of percussion players for the study and performance of characteristic literature.

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

098 - STRING ENSEMBLE
1.00 Credit(s)
Ensembles of string instrumentalists for the study and performance of characteristic literature.

099 - NEW MUSIC ENSEMBLE
1.00 Credit(s)
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. Major composers such as Stravinsky, Cowell, Crumb, Bartok, Varese, and Babbitt will be represented. Permission of the instructor.

Subject - Music (MUSC)

000 - ORIENTATION
1.00 Credit(s)
Familiarization with the department, requirements for majors, planning programs of courses, university catalog and library. Required of departmental majors.

001 - CONCERT AND RECITAL OBSERVATION
.00 Credit(s)
A required number of concerts and recitals to be attended each quarter. Required of all full-time music majors. Graded S/U.

100 - MUSIC
3.00 Credit(s)
A basic course in the nature, forms, styles, and media of music of all types and periods. Emphasis upon listening and understanding. Laboratory listening and concert attendance, knowledge of fundamentals, recognition of composers and representative literature expected.

101 - MUSIC
3.00 Credit(s)
The basic music course for music majors only.

110 - FUNDAMENTALS OF MUSIC FOR THE NON-MUSIC MAJOR
3.00 Credit(s)
Basic components of music. Designed to give the non-music major a background in the perception and reading of musical symbols. Includes listening experiences of representative literature and recognition of major composers. Permission of instructor is required.

112 - MUSIC FOR THE CLASSROOM TEACHER
3.00 Credit(s)
Music activities, materials, literature, unit planning, teaching methods and skills for the classroom teacher, grades K-6. Includes approximately 5 hours of field experience. Prerequisite: MUSC 110.

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

122 - THEORY OF MUSIC
3.00 Credit(s)
Continuation of MUSC 121.

123 - THEORY OF MUSIC
3.00 Credit(s)
Continuation of MUSC 122.

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

132 - EAR TRAINING 2
1.00 Credit(s)
Continuation of MUSC 131.

133 - EAR TRAINING 3
1.00 Credit(s)
Continuation of MUSC 132.

190 - SPECIAL TOPICS IN MUSIC
1.00 to 3.00 Credit(s)
210 - JAZZ HISTORY AND LITERATURE
3.00 Credit(s)
An in-depth study of modern jazz, from its roots in African tribal music through the gradual evolution of this American art form as it appears today.

211 - ELECTRONIC MUSIC
2.00 Credit(s)
The study of 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. Prerequisite: Permission of the instructor.

221 - ADVANCED THEORY OF MUSIC
4.00 Credit(s)
Continuation of MUSC 123. Study of 18th, 19th and 20th century compositional techniques. Development of analytical skills. Creative projects in composition. Continuation courses must be taken in sequence. Prerequisite: MUSC 123.

222 - ADVANCED THEORY OF MUSIC
4.00 Credit(s)
Continuation of MUSC 221.

223 - ADVANCED THEORY OF MUSIC
4.00 Credit(s)
Continuation of MUSC 222.

231 - ADVANCED EAR TRAINING
1.00 Credit(s)
Continuation of MUSC 131, 132 and 133. Designed to supplement and to be taken in conjunction with second year of music theory. Prerequisite: MUSC 133 or proficiency.

232 - ADVANCED EAR TRAINING
1.00 Credit(s)
Continuation of MUSC 231.

233 - ADVANCED EAR TRAINING
1.00 Credit(s)
Continuation of MUSC 232.

241 - BASIC CONDUCTING
2.00 Credit(s)
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(s)
Designed to acquaint vocalists with 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(s)
Continuation of MUSC 261 in French.

263 - GERMAN DICTION FOR SINGERS
1.00 Credit(s)
Continuation of MUSC 262 in German.

280 - PIANO PROFICIENCY
.00 Credit(s)

290 - SPECIAL TOPICS IN MUSIC
1.00 to 3.00 Credit(s)

310 - AMERICAN MUSIC
3.00 Credit(s)
An investigation of sacred and secular American music from colonial America to the present with particular attention to native art music and the incorporation of jazz into symphonic works of the 20th century.

311 - COUNTERPOINT
2.00 Credit(s)
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 Credit(s)
The evolution of musical forms and styles from the Baroque to the present. Theoretical and stylistic analysis of representative music. Prerequisite: MUSC 223.

313 - ORCHESTRATION
2.00 Credit(s)
The instruments of the band and orchestra. Arrangements for the band and orchestra. Arrangements for string, woodwind and brass combinations. A study of orchestrations by romantic, classical, and modern composers. Prerequisite: MUSC 223.

May be repeated on an unlimited basis by music majors to meet major requirements as stated and as electives.
314 - MUSIC COMPOSITION
3.00 Credit(s)
Study of 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. Prerequisite: Permission of the instructor.

321 - MUSIC HISTORY AND LITERATURE
3.00 Credit(s)
The historical development of music literature. Study of representative literature and composers: Ancient, Medieval and Renaissance periods. Prerequisite: MUSC 100.

322 - MUSIC HISTORY AND LITERATURE
3.00 Credit(s)
Study of the Baroque and Classical periods. Prerequisite: MUSC 100.

323 - MUSIC HISTORY AND LITERATURE
3.00 Credit(s)
Study of the Romantic and Twentieth Century periods. Prerequisite: MUSC 100.

334 - WOODWIND METHODS
2.00 Credit(s)
Study, elementary performance skills, pedagogy, and materials of the woodwind instruments. For future school music teachers.

336 - BRASS METHODS
2.00 Credit(s)
Study, elementary performance skills, pedagogy, and materials of the brass instruments. For future school music teachers.

338 - PERCUSSION METHODS
2.00 Credit(s)
Study, elementary performance skills, pedagogy, and materials of the percussion instruments. For future school music teachers.

339 - STRING METHODS
2.00 Credit(s)
Study, elementary performance skills, pedagogy, and materials of the orchestral stringed instruments. For future school music teachers.

342 - ADVANCED CONDUCTING - INSTRUMENTAL
2.00 Credit(s)
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 Credit(s)
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.

361 - ELEMENTARY MUSIC METHODS (MUSIC EDUCATION MAJORS)
3.00 Credit(s)
Philosophy, techniques, materials, curriculum planning for the elementary music teacher and supervisor. Includes approximately 20 hours of field experience. Prerequisite: Admission to the Teacher Education Program or approval of the Director of Teacher Education.

371 - APPLIED FIELD LITERATURE-PEDAGOGY 1
1.00 Credit(s)
Study of the professional and educational literature in a specific applied field.

372 - APPLIED FIELD LITERATURE-PEDAGOGY 2
1.00 Credit(s)
Continuation of MUSC 371.

373 - APPLIED FIELD LITERATURE-PEDAGOGY 3
1.00 Credit(s)
Continuation of MUSC 372.

380 - JUNIOR RECITAL
.00 Credit(s)

390 - SPECIAL TOPICS IN MUSIC
1.00 to 3.00 Credit(s)

411 - ADVANCED ELECTRONIC MUSIC COMPOSITION
2.00 Credit(s)
Advanced study and creative work in the area of electronic music. The focus will be upon advanced synthesis, recording and notational techniques as they relate to student's creative efforts. Relevant historical topics and a survey of the electronic music literature will be included.

130 MUSIC
DEPARTMENT OF PHILOSOPHY AND RELIGION

(Department 115)

Professors Beanblossom, Hindeliter, Lenssen (Chair); Associate Professor Plunkett

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

General Education Requirements All undergraduates are required to take one course in philosophy and one in religion. Philosophy 100 or 102 may be taken to fulfill the philosophy requirement. Religion 105, 107, 108, 109, or 110 may be taken to fulfill the religion requirement.

Philosophy Major The major in philosophy requires a minimum of 45 quarter hours, including the following courses: 234, two of the following (237, 238, 340), two courses in the history of philosophy (102, 331, 343, 347, 371, 374), and either 480 or 483. A maximum of three courses in religion may be applied to the philosophy major.

Religion Major The major in religion requires a minimum of 45 quarter hours beyond religion 105 and must include either 481 or 484. A maximum of three courses in philosophy may be applied towards the religion major.

Philosophy and Religion Major The major in philosophy and religion requires a minimum of 45 quarter hours beyond philosophy 100 and religion 105. 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.

MUSIC 131
Minor Programs Minors are offered in both philosophy and religion. A minimum of 30 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 on the curricular requirements of the program can be secured from the department chair.

Pretheology The recommendations of the American Association of Theological Schools are followed in counseling the pretheological student in planning a program leading to the Bachelor of Arts degree. A major in the department of philosophy and religion or a major in another appropriate department may be selected.

A faculty member in the department of philosophy and religion serves as advisor to the pretheological student in planning a preparliamentary program, along with a departmental advisor in the major, if the student elects a major outside the department of philosophy and religion.

Philosophy

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

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

Subject - Philosophy (PHIL)

000 - ORIENTATION
1.00 Credit(s)
Familiarization with the department, requirements for majors, planning program of courses, University catalog and library.

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

102 - GREAT PHILOSOPHERS
3.00 Credit(s)
An introduction to 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 3.00 Credit(s)
May be repeated for credit depending on content.

MOST OF THE FOLLOWING COURSES ARE OFFERED IN ALTERNATE YEARS OR ON DEMAND. PREREQUISITE FOR THESE COURSES: ONE COURSE IN PHILOSOPHY OR CONSENT OF INSTRUCTOR

234 - LOGIC
3.00 Credit(s)
The study of logical fallacies and the principles of correct reasoning. The application of formal logical analysis to arguments encountered in ordinary language.

237 - KNOWLEDGE AND TRUTH
3.00 Credit(s)
An examination of the scope and justification of knowledge with reference to problems such as skepticism, sense perception, reason, belief, and truth.

238 - ETHICS
3.00 Credit(s)
An examination of selected ethical theories and their rational justification. The use of ethical theories for resolving ethical issues in personal and social decision-making.

290 - SPECIAL TOPICS IN PHILOSOPHY
1.00 to 3.00 Credit(s)
May be repeated for credit depending on content.

320 - SOCIAL JUSTICE
3.00 Credit(s)
Theories of justice in contemporary society including conceptions of the law, human rights, equality, liberty, and responsibility.
325 - PHILOSOPHY OF RELIGION
3.00 Credit(s)
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 RELG 325.)

331 - PLATO AND ARISTOTLE
3.00 Credit(s)
A study of the Greek philosophers, Plato and Aristotle, against the background of the Pre-Socratics and Socrates.

334 - SYMBOLIC LOGIC
3.00 Credit(s)
The evaluation of deductive arguments by means of the formal procedures of modern symbolic logic. Prerequisite: PHIL 234.

336 - ETHICS IN PROFESSIONAL LIFE
3.00 Credit(s)
An examination of ethical behavior with emphasis 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.

338 - BIOETHICS
3.00 Credit(s)
Ethical issues involving personal and social values in matters of life and death, such as experimentation with human subjects, genetic control, abortion, and patients' rights to receive and refuse treatment.

339 - BUSINESS ETHICS
3.00 Credit(s)
A study of philosophical approaches to ethics and their application to moral issues in business, such as conflicts of interest, whistle blowing, trade secrets, hiring, promotion and disciplinary practices, corporate responsibility to consumers and to society.

340 - THEORIES OF BEING
3.00 Credit(s)
An examination of theories of being with reference to problems such as reality, existence, essence, nature and their implications for knowledge and values.

341 - AESTHETICS
3.00 Credit(s)
An examination of 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
3.00 Credit(s)
Main currents in American philosophy, including representative thinkers in such traditions as Puritanism, Transcendentalism, Pragmatism, and Realism.

345 - EXISTENTIALISM
3.00 Credit(s)
The historical roots of existentialism in Kierkegaard and Nietzsche, and the thought of representative writers such as Heidegger, Sartre, Camus, Dostoyevsky and Kafka.

347 - MEDIEVAL THOUGHT
3.00 Credit(s)
The development of theological and philosophical thought from 500 A.D. to 1350 A.D. (Also listed as RELG 347.)

371 - MAJOR PHILOSOPHICAL MOVEMENTS
3.00 Credit(s)
A study of 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 upon content.

374 - MAJOR PHILOSOPHERS
3.00 Credit(s)
A study of 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 upon content.

390 - SPECIAL TOPICS IN PHILOSOPHY
1.00 to 3.00 Credit(s)
May be repeated for credit depending on content.

394 - SEMINAR IN PHILOSOPHY
1.00 to 3.00 Credit(s)
May be repeated for credit depending on content. Instructor. May be repeated for credit depending on

480 - PHILOSOPHY HONORS ESSAY
3.00 Credit(s)
A critical essay on a topic selected in consultation with a faculty advisor. The student enrolls for this course 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.
483 - PHILOSOPHY SENIOR HONORS ESSAY
3.00 Credit(s)
Open to students with at least a 3.5 cumulative GPA in their Philosophy or Philosophy and Religion major. The student enrolls for this course 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 3.00 Credit(s)
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.

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

108 - INTRODUCTION TO CHRISTIANITY
3.00 Credit(s)
A study of the major teachings, practices and institutional forms of Christianity in their historical and contemporary settings.

109 - INTRODUCTION TO THE OLD TESTAMENT
3.00 Credit(s)
Critical reading of the Old Testament (the Hebrew Bible): its historical background, literary features, and theological claims.

110 - INTRODUCTION TO THE NEW TESTAMENT
3.00 Credit(s)

191 - SPECIAL TOPICS IN RELIGION
1.00 to 3.00 Credit(s)
May be repeated for credit depending on content.

MOST OF THE FOLLOWING COURSES ARE OFFERED IN ALTERNATE YEARS OR ON DEMAND. PREREQUISITE FOR THESE COURSES: EXCEPT HELLENISTIC GREEK: ONE COURSE IN RELIGION OR CONSENT OF INSTRUCTOR

000 - ORIENTATION
1.00 Credit(s)
Familiarization with the department, requirements for majors, planning program of courses, University catalog and library.

105 - RELIGION
3.00 Credit(s)
An exploration of 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.

251 - OLD TESTAMENT NARRATIVES
3.00 Credit(s)
Critical examination of the narrative books of the Old Testament, concentrating on the Pentateuch and historical books and how they convey their religious convictions through stories.

262 - CHRISTIANITY AND CULTURE
3.00 Credit(s)
An examination of various interpretations of the relationship of Christianity to particular cultural phenomena, including literature, science, philosophy, psychology and the economic and political orders.
263 - CHRISTIAN ETHICS
3.00 Credit(s)
The relation of biblical and theological thought to
the development of ethical principles. Application
to personal and social moral issues, such as
marriage, family, race, politico-economic life,
international affairs.

264 - BUDDHISM
3.00 Credit(s)
The ideas and practices of the Buddhist faith in
East and Southeast Asia, with emphasis on the
life and teaching of Buddha and the growth of
different forms of Buddhism.

266 - ISLAM
3.00 Credit(s)
An examination of Islam: its history and tradit-
tions, its contemporary practice, and the issues
faced by 20th century Muslims in dealing with
the West.

281 - HELLENISTIC GREEK 1
3.00 Credit(s)
Study of Hellenistic Greek with heavy emphasis
on grammar, and some readings from the Greek

282 - HELLENISTIC GREEK 2
3.00 Credit(s)
Study of 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 Credit(s)
Study of 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 3.00 Credit(s)
May be repeated for credit depending on con-
tent.

325 - PHILOSOPHY OF RELIGION
3.00 Credit(s)
Critical inquiry into issues such as the nature
and existence of God, the problem of evil, the
significance of religious experience, the justifica-
tion of religious belief, the relation of faith and
reason. (Also listed as PHIL 325.)

346 - EARLY CHRISTIAN THOUGHT
3.00 Credit(s)
Christianity from the post-New Testament period
to the Council of Chalcedon in 451 A.D.

347 - MEDIEVAL THOUGHT
3.00 Credit(s)
The development of theological and philosophi-
cal thought from 500 A.D. to 1350 A.D.

353 - REFORMATION AND MODERN CHRISTI-
ANITY
3.00 Credit(s)
The Protestant-Catholic conflict and the impact
of modern secular thought on Christianity from
the Reformation through the nineteenth century.

361 - TWENTIETH CENTURY CHRISTIAN
THOUGHT
3.00 Credit(s)
Basic issues, major theological positions, and
representative theologians of twentieth century
Christian thought.

363 - OLD TESTAMENT PROPHETS
3.00 Credit(s)
Critical examination of the prophetic books of the
Old Testament from historical, literary and theo-
logical perspectives.

365 - JESUS AND THE GOSPELS
3.00 Credit(s)
Critical examination of the New Testament
Gospels: their portrayals of Jesus, their theologi-
cal perspectives and their reliability as sources
for the life of Jesus.

383 - READINGS IN HELLENISTIC GREEK
1.00 Credit(s)
Assigned readings in the Greek New Testament
and other Hellenistic Greek literature. Offered
on demand. May be repeated for credit each
quarter. Prerequisite: RELG 283.

391 - SPECIAL TOPICS IN RELIGION
1.00 to 3.00 Credit(s)
May be repeated for credit depending on con-
tent.

395 - SEMINAR IN RELIGION
1.00 to 3.00 Credit(s)
May be repeated for credit depending on con-
tent.

463 - LIFE AND TEACHINGS OF ST. PAUL
3.00 Credit(s)
The insights of the most influential thinker and
apostle in the early church.
263 - CHRISTIAN ETHICS
3.00 Credit(s)
The relation of biblical and theological thought to the development of ethical principles. Application to personal and social moral issues, such as marriage, family, race, politico-economic life, international affairs.

264 - BUDDHISM
3.00 Credit(s)
The ideas and practices of the Buddhist faith in East and Southeast Asia, with emphasis on the life and teaching of Buddha and the growth of different forms of Buddhism.

266 - ISLAM
3.00 Credit(s)
An examination of Islam: its history and traditions, its contemporary practice, and the issues faced by 20th century Muslims in dealing with the West.

281 - HELLENISTIC GREEK 1
3.00 Credit(s)
Study of Hellenistic Greek with heavy emphasis on grammar, and some readings from the Greek New Testament. Offered on demand.

282 - HELLENISTIC GREEK 2
3.00 Credit(s)
Study of 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 Credit(s)
Study of 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 3.00 Credit(s)
May be repeated for credit depending on content.

325 - PHILOSOPHY OF RELIGION
3.00 Credit(s)
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.)

346 - EARLY CHRISTIAN THOUGHT
3.00 Credit(s)
Christianity from the post-New Testament period to the Council of Chalcedon in 451 A.D.

347 - MEDIEVAL THOUGHT
3.00 Credit(s)
The development of theological and philosophical thought from 500 A.D. to 1350 A.D.

353 - REFORMATION AND MODERN CHRISTIANITY
3.00 Credit(s)
The Protestant-Catholic conflict and the impact of modern secular thought on Christianity from the Reformation through the nineteenth century.

361 - TWENTIETH CENTURY CHRISTIAN THOUGHT
3.00 Credit(s)
Basic issues, major theological positions, and representative theologians of twentieth century Christian thought.

363 - OLD TESTAMENT PROPHETS
3.00 Credit(s)
Critical examination of the prophetic books of the Old Testament from historical, literary and theological perspectives.

365 - JESUS AND THE GOSPELS
3.00 Credit(s)

383 - READINGS IN HELLENISTIC GREEK
1.00 Credit(s)
Assigned readings in the Greek New Testament and other Hellenistic Greek literature. Offered on demand. May be repeated for credit each quarter. Prerequisite: RELG 283.

391 - SPECIAL TOPICS IN RELIGION
1.00 to 3.00 Credit(s)
May be repeated for credit depending on content.

395 - SEMINAR IN RELIGION
1.00 to 3.00 Credit(s)
May be repeated for credit depending on content.

463 - LIFE AND TEACHINGS OF ST. PAUL
3.00 Credit(s)
The insights of the most influential thinker and apostle in the early church.
481 - RELIGION SENIOR ESSAY
3.00 Credit(s)
A critical essay on a topic selected in consultation with a faculty advisor. The student enrolls for this course 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.

484 - RELIGION SENIOR HONORS ESSAY
3.00 Credit(s)
Open to students with at least a 3.5 cumulative GPA in their Religion or Philosophy and Religion major. The student enrolls for this course 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 3.00 Credit(s)
Departmental permission required. May be repeated for credit depending on content.

DEPARTMENT OF PHYSICS

(department 124)

Professor Gangemi (Chair); Associate Professors Messick, Roll; Assistant Professor Johnson.

The primary aim of the physics department is to offer courses that will stimulate scientific thought, train the student to reason from fundamental experimental fact, further the student's desire to continue scientific investigation, and meet the needs of those students who are interested in physics for its cultural or its vocational value.

The department aims to give a training sufficiently broad to enable the student to appreciate the physics of scientific articles; to teach physics in the public schools; to apply physics in engineering, medicine, and other sciences; and to pursue graduate work.

Ohio Northern University offers both the bachelor of arts degree and the bachelor of science degree with majors in physics.

The physics major who desires the bachelor of arts degree in addition to satisfying any requirement for that degree mandated by the Ohio Northern University College of Arts and Sciences must complete 47 hours in the major field. The required courses are: Physics 231, 232, 233, 234, 235, 236, 303, (310, 320, 330, 340), 351, 352, 353, 361, 363, 411, 412, 463.

Six of the 47 hours are taken from the advanced laboratory group: Physics 310, 320, 330, 340. At the discretion of the department, the courses Physics 413, 432 and/or 433 may also be required of the student. This determination will be made by the department chair in consultation with the physics department staff and to a large extent will be determined by the career goals of the student.

The physics major who desires the bachelor of science degree in addition to satisfying any requirements for that degree mandated by the Ohio Northern University College of Arts and Sciences must complete 55 hours in the major field. The required courses are: Physics 231, 232, 233, 234, 235, 236, 361, 303, 363, 351, 352, 353, 310, 320, 330, 340, 411, 412, 463, 432, 413, 433.

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

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

In addition to the major and minor in physics, the department of physics also offers a program leading to certification for teaching in the Ohio public schools. The program is designed for students whose goal is to teach physics in the high schools and will include 45 hours chosen to satisfy Ohio state certification requirements and to a limited extent the personal interests of the student. Although some flexibility is permitted, the courses taken in this program are chosen in consultation with the chair of the department of physics and will depend upon the completion of any necessary prerequisites.

This program differs from the major in physics in that the student desiring certification for teaching must also be registered in the Center for Teacher Education and Certification and satisfy all requirements as determined by the state of Ohio and the Center for Teacher Education and Certification of Ohio Northern University. A detailed description of these requirements can be obtained from the director of the Center for Teacher Education and Certification.
481 - RELIGION SENIOR ESSAY
3.00 Credit(s)
A critical essay on a topic selected in consultation with a faculty advisor. The student enrolls for this course 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.

484 - RELIGION SENIOR HONORS ESSAY
3.00 Credit(s)
Open to students with at least a 3.5 cumulative GPA in their Religion or Philosophy and Religion major. The student enrolls for this course 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 3.00 Credit(s)
Departmental permission required. May be repeated for credit depending on content.

DEPARTMENT OF PHYSICS

(Department 124)

Professor Gangemi (Chair); Associate Professors Messick, Roll; Assistant Professor Johnson.

The primary aim of the physics department is to offer courses that will stimulate scientific thought, train the student to reason from fundamental experimental fact, further the student's desire to continue scientific investigation, and meet the needs of those students who are interested in physics for its cultural or its vocational value.

The department aims to give a training sufficiently broad to enable the student to appreciate the physics of scientific articles; to teach physics in the public schools; to apply physics in engineering, medicine, and other sciences; and to pursue graduate work.

Ohio Northern University offers both the bachelor of arts degree and the bachelor of science degree with majors in physics.

The physics major who desires the bachelor of arts degree in addition to satisfying any requirement for that degree mandated by the Ohio Northern University College of Arts and Sciences must complete 47 hours in the major field. The required courses are: Physics 231, 232, 233, 234, 235, 236, 303, (310, 320, 330, 340), 351, 352, 353, 361, 363, 411, 412, 463. Six of the 47 hours are taken from the advanced laboratory group: Physics 310, 320, 330, 340. At the discretion of the department, the courses Physics 413, 432 and/or 433 may also be required of the student. This determination will be made by the department chair in consultation with the physics department staff and to a large extent will be determined by the career goals of the student.

The physics major who desires the bachelor of science degree in addition to satisfying any requirements for that degree mandated by the Ohio Northern University College of Arts and Sciences must complete 55 hours in the major field. The required courses are: Physics 231, 232, 233, 234, 235, 236, 361, 303, 363, 351, 352, 353, 310, 320, 330, 340, 411, 412, 463, 432, 413, 433.

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

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

In addition to the major and minor in physics, the department of physics also offers a program leading to certification for teaching in the Ohio public schools. The program is designed for students whose goal is to teach physics in the high schools and will include 45 hours chosen to satisfy Ohio state certification requirements and to a limited extent the personal interests of the student. Although some flexibility is permitted, the courses taken in this program are chosen in consultation with the chair of the department of physics and will depend upon the completion of any necessary prerequisites.

This program differs from the major in physics in that the student desiring certification for teaching must also be registered in the Center for Teacher Education and Certification and satisfy all requirements as determined by the state of Ohio and the Center for Teacher Education and Certification of Ohio Northern University. A detailed description of these requirements can be obtained from the director of the Center for Teacher Education and Certification.
000 - ORIENTATION
1.00 Credit(s)
Familiarization with the department, requirements for majors' programs, University catalog and library. Required of departmental majors. Offered every year in the Fall Term.

100 - PHYSICS
3.00 Credit(s)
Intended for liberal arts students. Study of the basic laws and principles which govern the behavior of nature with special emphasis on mechanics, and atomic and nuclear structure. The interaction of physics with other areas of culture will be considered. Offered each term every year.

180 - SEMINAR
1.00 Credit(s)
Reading, discussion and reports on problems of historical and current interest in physics. Offered only when sufficient interest warrants.

190 - SPECIAL TOPICS IN PHYSICS
1.00 to 3.00 Credit(s)

211 - GENERAL PHYSICS: MECHANICS OF SOLIDS AND FLUIDS
3.00 Credit(s)
Basic principles of Newtonian mechanics of solids and liquids. The laboratory corresponding to this course is PHYS 234. Offered every year in the Fall Term.

212 - GENERAL PHYSICS: SOUND, HEAT, AND LIGHT
3.00 Credit(s)
Basic principles of sound propagation, heat and heat transfer, and light propagation. The laboratory corresponding to this course is PHYS 235. Offered every year in the Winter Term.

213 - GENERAL PHYSICS: ELECTRICITY AND MAGNETISM
3.00 Credit(s)
Basic principles of electrical and magnetic phenomena. The laboratory corresponding to this course is PHYS 236. Offered every year in the Spring Term.

231 - PHYSICS: MECHANICS OF SOLIDS AND FLUIDS
4.00 Credit(s)
Basic principles of Newtonian mechanics of solids and fluids employing the differential and integral calculus. The laboratory corresponding to this course is PHYS 234. Offered every year in the Fall and Winter Terms.

232 - PHYSICS: HEAT, SOUND, AND LIGHT
4.00 Credit(s)
Basic principles of sound propagation, heat transfer and light propagation. Differential and integral calculus are used. The laboratory corresponding to this course is PHYS 235. Offered every year in the Fall and Winter Terms.

233 - PHYSICS: ELECTRICITY AND MAGNETISM
4.00 Credit(s)
Basic principles of electrical and magnetic phenomena. Differential and integral calculus are used. The laboratory corresponding to this course is PHYS 236. Offered every year in the Spring term.

234 - PHYSICS LABORATORY: MECHANICS
1.00 Credit(s)
Experiments in basic Newtonian mechanics. PHYS 231 should be taken concurrently, or instructor's permission must be obtained. Offered every year in the Fall and Winter Terms.

235 - PHYSICS LABORATORY: HEAT, SOUND, AND LIGHT
1.00 Credit(s)
Experiments in heat, sound and light. PHYS 232 should be taken concurrently, or instructor's permission must be obtained. Offered every year in the Fall and Winter Terms.

236 - PHYSICS LABORATORY: ELECTRICITY AND MAGNETISM
1.00 Credit(s)
Experiments with basic electrical and magnetic phenomena. PHYS 233 should be taken concurrently or instructor's permission must be obtained. Offered every year in the Spring Term.

*241 - BASIC ELECTRONICS FOR MEDICAL TECHNICAL STUDENTS
2.00 Credit(s)
Basic physics of medical laboratory instruments, including principles of operation and techniques of use. Offered every year in the Spring Term.
250 - ASTRONOMY 1
3.00 Credit(s)
The evolution of man’s understanding of the structure and extent of the solar system. A review of current knowledge of the solar system, and an introduction to stellar systems. Offered every other year in the Fall Term.

251 - ASTRONOMY 2
3.00 Credit(s)
The structure and evolution of stars and stellar systems. Cosmology. Offered every other year in the Winter Term. Prerequisite: PHYS 250.

290 - SPECIAL TOPICS IN PHYSICS
1.00 to 3.00 Credit(s)

303 - MODERN PHYSICS
3.00 Credit(s)
The concepts of relativity, quantum and wave mechanics, atomic structure and absorption and emission processes. Offered every year in the Fall and Winter Terms. Prerequisites: MATH 264 and PHYS 233.

310 - THEORY AND ADVANCED LABORATORY: MECHANICS
1.00 to 3.00 Credit(s)
Prerequisite: One year of physics. Part of the Physics major program and offered when needed.

320 - THEORY AND ADVANCED LABORATORY: LIGHT, HEAT, SOUND
1.00 to 3.00 Credit(s)
Prerequisite: One year of physics. Part of the Physics major program and offered when needed.

330 - THEORY AND ADVANCED LABORATORY: ELECTRICITY, MAGNETISM AND ELECTRONICS
1.00 to 3.00 Credit(s)
Prerequisite: One year of physics. Part of the physics major program and offered when needed.

340 - THEORY AND ADVANCED LAB: NUCLEAR PHYSICS AND SOLID STATE
1.00 to 3.00 Credit(s)
Prerequisite: One year of physics. Part of the Physics major program and offered when needed.

351 - ANALYTICAL MECHANICS 1
3.00 Credit(s)
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
3.00 Credit(s)
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: MATH 362 and PHYS 351.

353 - NUCLEAR PHYSICS
3.00 Credit(s)
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. Offered every year in the Spring Term. Prerequisites: PHYS 231, 232, 233 and 303.

361 - ELECTRONICS
3.00 Credit(s)
Theory of solid state devices, rectifier circuits, transistor amplifiers, oscillators and modulators, instrumentation applications. Offered every year in the Fall Term. Prerequisite: PHYS 213 or 233.

363 - GEOMETRICAL OPTICS
2.00 Credit(s)
The laws of geometrical optics, image formation by mirrors and lenses, optical aberrations and optical instruments. Part of the Physics major program and offered when needed. Prerequisite: PHYS 232.

390 - SPECIAL TOPICS IN PHYSICS
1.00 to 3.00 Credit(s)

411 - ELECTRICITY AND MAGNETISM 1
3.00 Credit(s)
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
3.00 Credit(s)
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.

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

432 - STATISTICAL PHYSICS
3.00 Credit(s)

433 - THEORETICAL PHYSICS
4.00 Credit(s)
For students intending advanced work in physics, chemistry or mathematical physics. Selected topics in classical mechanics, electromagnetic theory, quantum theory, relativity, nuclear theory, and statistical mechanics. Part of the Physics major program and offered when needed. Prerequisites: MATH 362 and PHYS 412.

463 - PHYSICAL OPTICS
3.00 Credit(s)
The laws of physical optics, interference, diffraction and polarization and instrumentation. Part of the Physics major program and offered when needed. Prerequisite: PHYS 363.

490 - SPECIAL TOPICS IN PHYSICS
1.00 to 3.00 Credit(s)
Part of the Physics major program and offered when needed.

494 - SEMINAR IN PHYSICS
1.00 to 3.00 Credit(s)
Part of the Physics major program and offered when needed.

497 - INDEPENDENT STUDY
1.00 to 3.00 Credit(s)
Part of the Physics major program and offered when needed.
DEPARTMENT OF
PSYCHOLOGY AND
SOCIOLOGY

(Department 133)

Professors Compton, Cohoe, P. Hruschka (sabbatical), Wildman (Chair); Assistant Professor McGucken; Visiting Assistant Professor Kauffman

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.

To qualify for guaranteed admission students must complete the program with at least a 3.20 GPA. The program requires specially selected electives. Specific curricular requirements are available from the department chair.

Secondary Certification Secondary teacher certification programs are offered in psychology/sociology, and comprehensive social studies. Information on these programs is available from the department chair or the Center for Teacher Education and Certification.

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—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.

Psychology

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

Core
1. Psychology 100
2. Psychology 111
3. Psychology 210
4. Psychology 211
5. Biology 121
6. Math 142

For the major
1. Psychology 000
2. The Psychology Core
3. 31 hours of Psychology Electives
4. Biology 123 & 231 or 2 approved mathematics courses

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

Subject - Psychology (PSYC)

000 - ORIENTATION
1.00 Credit(s)
Familiarization with the departmental requirements for majors, planning programs of courses, University catalog and library; career options.

100 - PSYCHOLOGY
4.00 Credit(s)
General research and concepts in human behavior. Lectures, demonstrations, and observations.

111 - INTRODUCTORY LABORATORY
2.00 Credit(s)
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 Credit(s)
An introduction to the logic of experimental research and the application of the methods of science to the study of behavior. Particular emphasis on framing empirically testable hypotheses, experimental design, and analysis of data. Taught through lecture, computer simulation, and actual research experience. Extensive instruction in scientific communication and the APA Publications Manual. Prerequisites: MATH 142 and PSYC 100 and 111.

211 - EXPERIMENTAL PSYCHOLOGY 2
4.00 Credit(s)
Continuation of PSYC 210.

212 - PRINCIPLES OF BEHAVIOR MANAGEMENT
3.00 Credit(s)
The theory and supporting research which underlie behavior modification. Taught through lecture and laboratory demonstrations. Prerequisite: PSYC 100.

215 - DEVELOPMENTAL PSYCHOLOGY
3.00 Credit(s)
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
3.00 Credit(s)
The study of the atypical child. Diagnosis and treatment of disorders of infancy, childhood and adolescence. Prerequisite: PSYC 100.

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

290 - SPECIAL TOPICS IN PSYCHOLOGY
3.00 Credit(s)

300 - PRACTICUM IN TEACHING IN THE BEHAVIORAL SCIENCES
2.00 Credit(s)
Specially planned teaching experiences in courses in the department and preparation of demonstrations. May be repeated to 6 hours but repeated hours do not apply to major requirements. Prerequisites: PSYC 212 and approval of the chairman.

301 - SOCIAL PSYCHOLOGY
4.00 Credit(s)
The effect of social and cultural forces upon the individual. The nature and development of attitudes, languages, cognitive processes. Individual and group projects illustrative of the methodology of social psychology. Prerequisite: PSYC 100.

304 - PRACTICUM IN RESEARCH IN THE BEHAVIORAL SCIENCES
1.00 to 3.00 Credit(s)
Assist and participate in ongoing research by faculty members within the department. May be repeated up to 6 hours but repeated hours do not apply to major or graduation requirements. Prerequisites: PSYC 111 or SOC 251 and approval of the chairman.

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

310 - THEORIES OF LEARNING
3.00 Credit(s)
Major theories of learning, their origins and relevance in the light of current research and findings. Prerequisite: PSYC 212.

311 - PSYCHOLOGY OF PERSONALITY
4.00 Credit(s)
The major theories of personality from Freud to contemporary theoretical approaches. Prerequisite: PSYC 100.

312 - PSYCHOLOGICAL ASSESSMENT
4.00 Credit(s)
The study of psychological measurement and evaluation in the areas of intelligence tests, tests of separate abilities, and personality inventories. Experience will be gained in test administration, scoring and interpretation. Prerequisite: PSYC 100.

314 - CLASSICAL & INSTRUMENTAL CONDITIONING
3.00 Credit(s)
A quasi-historical account of the major issues involved in classical and instrumental conditioning. The course emphasizes major empirical findings and the major theoretical issues that have resulted. Current work in learning and memory is covered on both the animal and human level. Course to be taught in alternate years with PSYC 310. Prerequisite: PSYC 212.
316 - ORGANIZATIONAL PSYCHOLOGY
3.00 Credit(s)
A study of the interplay between people and organizations emphasizing basic psychological processes such as motivation, perception, and learning. Other areas of study include organizational climate, leadership, conflict resolution, decision making, and communication. Prerequisite: PSYC 100.

320 - PSYCHOLOGY AND THE LAW
3.00 Credit(s)
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
3.00 Credit(s)
Psychology as a biological science. Physiological events underlying behavior, including sensory, neural, and glandular involvement in such topics as motivation, emotion, and learning. Prerequisite: PSYCH 100 and BIOL 231 or 331.

336 - SENSATION AND PERCEPTION
3.00 Credit(s)
A study of sensory systems. Demonstration and evaluation of selected experiments in visual, auditory, gustatory, olfactory, and cutaneous perception. Prerequisites: PSYC 100 and BIOL 231 or 331.

337 - COMPARATIVE PSYCHOLOGY
3.00 Credit(s)
Survey of behavior of different phyletic levels from lower forms to man with special emphasis on primate behavior. Prerequisites: BIOL 121 and PSYC 100.

338 - BRAIN AND BEHAVIOR
3.00 Credit(s)
A survey of the brain systems involved in anxiety, arousal, depression, schizophrenia, etc. Consideration will also be given to the behavioral and neurophysiological effects of various psychoactive drugs. Prerequisites: PSYC 335 and BIOL 231 or 331.

390 - SPECIAL TOPICS IN PSYCHOLOGY
1.00 to 3.00 Credit(s)

394 - JUNIOR SEMINAR
1.00 Credit(s)
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 to students entering their senior year. Prerequisites: Junior status; only psychology majors.

411 - COUNSELING PSYCHOLOGY
3.00 Credit(s)
Basic methods of counseling plus a study of seven models for counseling intervention. Prerequisites: PSYC 311 or 420.

420 - ABNORMAL PSYCHOLOGY 1
3.00 Credit(s)

421 - ABNORMAL PSYCHOLOGY 2
3.00 Credit(s)
A review of the causes, diagnosis and treatment of schizophrenic disorders, paranoid disorders, disorders of impulse control, paraphilic disorders, personality disorders, organic mental disorders, and a survey of multiaxial diagnostic procedures and therapeutic techniques used in clinical psychology. Prerequisite: PSYC 100.

424 - PRACTICUM IN COUNSELING PSYCHOLOGY
3.00 Credit(s)
Work with patients in a clinical setting under supervision, practical experience in interviewing and administering routine psychological tests. May be repeated once. Prerequisite: Approval of instructor.

426 - PRACTICUM IN PSYCHOLOGY
6.00 to 15.00 Credit(s)
A field experience in the area of psychology. Open to seniors. Prerequisite: Approval of chairman.
HISTORY AND SYSTEMS OF PSYCHOLOGY
3.00 Credit(s)
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.

SPECIAL TOPICS IN PSYCHOLOGY
1.00 to 3.00 Credit(s)

SEMINAR IN PSYCHOLOGY
3.00 Credit(s)
Open to seniors.

INDEPENDENT STUDY IN PSYCHOLOGY
1.00 to 3.00 Credit(s)
Prerequisite: Approval of chairman.

SOCIOLOGY
A major in sociology consists of the following requirements:
1. Sociology 000
2. Sociology 105
3. Sociology 251
4. Sociology 252
5. Sociology 446
6. Math 142
7. 30 hours of sociology electives

A minor in sociology consists of the following requirements:
1. Sociology 105
2. Sociology 251
3. Sociology 252
4. Sociology 446
5. Math 142
6. Additional sociology courses totaling 15 hours, selected in consultation with a member of the sociology faculty.

SOCIOLOGY AND THE AMERICAN SOCIOCAL ASSOCIATION
Outstanding students with sophomore or junior standing are encouraged to participate in this special program of independent study. In the first phase of the program, each student reads independently during the summer on a selected topic. In the second phase, the student attends the annual meeting of the American Sociological Association to hear reports of current research, to attend business sessions of the Association, and to learn about career opportunities in sociology. In the third phase, the student writes a paper on the topic of the summer reading and submits other reports on the activities at the annual meeting. Each student completing the program earns transferable credit from the University of Iowa, the home institution of the coordinators of the program. Further information and applications can be secured from the ONU sociology faculty.

SOCIOLOGY (SOC)

ORIENTATION
1.00 Credit(s)
Familiarization with the department, requirements for majors, planning program of courses, University catalog and library.

SOCIOCY
3.00 Credit(s)
Introduction to the basic phenomena and processes of social life: culture, socialization, deviance, social institutions (family, polity, economy, education, religion, military), bureaucratization, social inequality, collective behavior, social movements, and population. Analysis of the interplay between the person and social groups.

SPECIAL TOPICS IN SOCIOLOGY
1.00 to 3.00 Credit(s)

MARRIAGE AND THE FAMILY
3.00 Credit(s)
An institutional perspective on the family, patterns of courting, marital parental behavior, trends in the contemporary American family. Prerequisite: SOC 105.

SOCIAL DEVIANCE 1
3.00 Credit(s)
Sociological perspectives on the processes of individual and group deviance, a discussion of selected major forms of deviance, their causes, processes, and consequences. Prerequisite: SOC 105.

ORGANIZATIONAL BEHAVIOR
3.00 Credit(s)
Theories, methods, and data in the sociological analysis of complex organizations (corporations, social agencies, hospitals, armies, labor unions, schools, governments, prisons, philanthropies, political parties). Prerequisite: SOC 105.
247 - SOCIAL INEQUALITY
3.00 Credit(s)
The variety of stratification systems; status attainment, social mobility, and social immobility; detailed descriptions of life among the poor, rich and middle classes in America and elsewhere. Prerequisite: SOC 105.

248 - MINORITY RELATIONS
3.00 Credit(s)
A study of the dynamics of minority-majority relations within American society, and of the characteristics, conditions, and problems of several minority groups, as defined by race, ethnicity, or sex. Prerequisite: SOC 105.

250 - CULTURAL ANTHROPOLOGY
3.00 Credit(s)
An introduction to 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.

251 - QUANTITATIVE METHODS IN BEHAVIORAL RESEARCH
4.00 Credit(s)
Applications in the behavioral sciences of several sampling distributions (binomial, normal, Student's t, Chi square, F, and certain distributions used in "nonparametric tests") as well as correlation and regression. Major emphasis on testing behaviorally meaningful hypotheses. Prerequisite: MATH 142.

252 - QUALITATIVE METHODS IN BEHAVIORAL RESEARCH
4.00 Credit(s)
Survey of major research techniques, including participant and non-participant observation, interview, questionnaire, use of available data, and experiment. Other topics include sampling and establishing causality in non-experimental research. Prerequisite: SOC 105.

261 - CRIMINOLOGY
3.00 Credit(s)
A study of 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.

291 - SPECIAL TOPICS IN SOCIOLOGY
1.00 to 3.00 Credit(s)

300 - PRACTICUM IN TEACHING IN THE BEHAVIORAL SCIENCES
2.00 Credit(s)
Specially planned teaching experiences in courses in the department, including tutoring, curriculum development and preparation of demonstrations. Prerequisite: PSYC 212 and approval of the chairman. May be repeated to 6 hours. The course does not apply to major requirements.

301 - SOCIAL PSYCHOLOGY
4.00 Credit(s)
The effect of social and cultural forces upon the individual. The nature and development of attitudes, languages, and cognitive processes. Individual and group projects illustrative of the methodology of social psychology. Prerequisite: SOC 105.

304 - PRACTICUM IN RESEARCH IN THE BEHAVIORAL SCIENCES
1.00 to 3.00 Credit(s)
Assist and participate in ongoing research by faculty members within the department. Prerequisite: SOC 202 and approval of the chairman. May be repeated up to 6 hours but repeated hours do not apply to major or graduation requirements.

340 - URBAN SOCIOLOGY
3.00 Credit(s)
Prerequisite(s): SOC 105
Sociological perspectives on the organization, processes, problems, and other distinctive aspects of urban life. Topics include "urban decay," the "suburbia" phenomena, and the impact of the urban environment on the individual. Prerequisite: SOC 105.

341 - DEMOGRAPHIC ANALYSIS
3.00 Credit(s)
Size, composition, distribution and growth of human populations; theories of population growth and migrations; collection and use of census and other survey data. Major sources include the U.S. Census and the United Nations Demographic Yearbook, which compiles data from the censuses of the U.N. member nations-including Third World. Applications in policy-making and marketing. Issues include population explosions, birth control and abortion. Prerequisite: SOC 105.
348 - MEDICAL SOCIOLOGY
3.00 Credit(s)
Social interaction between patient and physicians, nurses, pharmacists, and other healthcare personnel; social interaction among those personnel; social definition of illness; societal response to illness; social epidemiology; education and training of medical personnel. Prerequisite: SOC 105.

352 - SOCIAL DEVIANCE 2: SEMINAR
3.00 Credit(s)
Advanced study, including considerable independent study, of topics covered in SOC 243. Special emphasis on competing theories of deviance and on very recent research. Prerequisite: SOC 243.

361 - DELINQUENCY AND JUVENILE JUSTICE
3.00 Credit(s)
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.

391 - SPECIAL TOPICS IN SOCIOLOGY
1.00 to 3.00 Credit(s)

446 - SOCIAL THOUGHT
4.00 Credit(s)
Traces sociological theorizing from sociology's historical origins through the classical and contemporary periods. Important theorists covered include Karl Marx, Emile Durkeim, Max Weber, George Herbert Mead, Talcott Parsons. Emphasis is placed on comparing and contrasting the major theoretical perspectives which provide the foundation for a scientific study of social life. Prerequisite: SOC 105.

491 - SPECIAL TOPICS IN SOCIOLOGY
1.00 to 3.00 Credit(s)

498 - INDEPENDENT STUDY IN SOCIOLOGY
1.00 to 3.00 Credit(s)
Prerequisite: Approval of chairman.
The College of Business Administration

Terry L. Maris, Dean

Accounting
Professor Young; Associate Professors Sung, Woods; Assistant Professors Chipalkatti, Christopher, Rogers; Visiting Instructor O'Reilly

Economics
Professor Goldberg; Associate Professor Meiningher; Assistant Professor Wilson; Visiting Assistant Professor Rishi

Finance
Assistant Professor Mohan

Management
Professors Cooper, Maris; Associate Professor Savino; Visiting Instructor West

Marketing
Associate Professor Ewing; Assistant Professor Hoyt

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.

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.

High school seniors with proven superior ability and maturity may enroll for a limited amount of course work for credit on campus during their senior year, or during the summer preceding, if they have the written recommendation of their high school principal and the approval of the Academic Qualifications and Scholarship Committee of the College of Business Administration.

Transfer Students The Ohio Northern University College of Business Administration welcomes students from other accredited colleges and universities. 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.

Degree Requirements
General Education

Orientation
Communication Skills
1. English 110, 111, and one other English course
2. Speech 100 plus two approved speech electives

Distribution Requirements
Fine Arts
1. One course from among Art 100, Music 100, or Theatre 105
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.

Minors

The minors shown below are available only to non-business majors. (A "C" grade or better is required in all courses.)


Economics Minor: Economics 100, 202, 203, 383, 384, and 15 hours of approved economics electives.


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 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 2.00 grade point average.
6. A letter grade of "C" or better in all but one course specified in (2) and (3) above.
1. A student may not register for more than 19 hours of academic course work without the dean's written approval. A normal program consists of 12 to 18 scheduled hours including physical education.

2. All freshmen in the College of Business Administration are required to take orientation, which is scheduled in the fall quarter.

3. A student indicates his/her major choice by completing a declaration of major form available in the Office of the Dean. Faculty advisors assist the student in the planning of his/her major.

4. Each student enrolled in the College of Business Administration is expected to make consistent progress toward completion of the degree requirements of his/her major(s).

5. CBA majors need to complete 500-231 and 500-232 with a C grade or higher before attempting 500-232 and 500-233 respectively. CBA majors also need to complete 500-100 with a C grade or higher before attempting either 500-202 or 500-203.

6. With the written permission of the instructor and the dean, course prerequisites may be waived.

7. Except where noted in the course descriptions, credit hours earned in repeated courses may be counted only once in the total hours required for graduation.

8. A student not enrolled for one academic year (except on approved academic leave) must meet graduation requirements in the catalog effective for the academic year during which the student reentered.

**S/U Grade Option**

Sophomores, juniors, seniors, and post graduate students in the College of Business Administration are given the opportunity to register for one course per 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.

6. The grade of "S" is to be equated with A,

B, C, and the grade of "U" is equated with D or F. S/U grades are not computed in the accumulative grade point average.

7. The student cannot change the grading option after the second week of classes.

**Classification of Students**

For purposes of classification, the minimum requirements for sophomore standing are 45 quarter hours of completed academic work; for junior standing 90 quarter hours; and for senior standing 135 quarter hours.

**Academic Probation**

A grade point average of 2.00 is required for graduation. If a student's accumulative grade point average falls below 2.00, he/she is placed on academic probation and is not eligible to participate in extracurricular activities.

Any student on probation whose work for the following quarter continues below 2.00 will have his/her record reviewed by the Academic Qualifications and Scholarship Committee of the College and may be recommended to the dean for suspension or dismissal from the University.

**Prelaw Program**

Business students interested in the Prelaw Program will find a complete description on page 32 of this publication.

**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.
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 15 quarter hours of credit. The academic year goes from September 1 to June 1.

Summer internships take place in a wider area of coverage around Ohio. The summer program lasts nine weeks, usually within the period of June 1 to September 1. As with academic-year internships, students may earn up to 15 credit hours.

International Business Program

The international business program allows students to gain specialized coursework and experience unique to a country or region. Although an emphasis potentially can be pursued for any location in the world, the college concentrates its resources on the members of the European Community. Currently these include Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and the United Kingdom.

The principal opportunities available are student exchange, study abroad, and work abroad. Formal agreements exist for the exchange of students between Ohio Northern University and Glasgow Caledonian University in Scotland and the University of Science and Technology in France. Students participating in these programs typically study abroad during their junior year.

Study abroad may take place at virtually any foreign college or university if their 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 15 credits toward graduation through the Internship Program.

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 coursework in foreign language are encouraged to incorporate such courses into their undergraduate studies.

COLLEGE OF BUSINESS ADMINISTRATION

(Department 500)

Subject - General Business (ABUS) —

000 - ORIENTATION / CAREER DEVELOPMENT AND SEARCH
1.00 Credit(s)
Familiarization with the college, requirements of the majors, planning sequences of courses, university catalog and library, career investigation and guidance. Fall Quarter. Course graded S or U.

201 - PERSONAL COMPUTER APPLICATIONS FOR BUSINESS
3.00 Credit(s)
Business applications for microcomputers. Introductory level use of software for word processing, file management, spreadsheets, and graphics.

322 - BUSINESS LAW 1
3.00 Credit(s)
This course examines the legal environment in which businesses must operate. Topics include business ethics, sources of law, methods of dispute resolution, and the basic laws regulating contracts, agency, business organizations, the workplace, consumer transactions, purchase and sale of securities, anticompetitive activities, actions affecting the environment, and international business transactions.

323 - BUSINESS LAW 2
3.00 Credit(s)
This course examines the law as it applies to certain private business transactions. Topics include contracts, sales, commercial paper, secured transactions, suretyship, and bankruptcy. Prerequisite: ABUS 322.
324 - BUSINESS LAW 3  
3.00 Credit(s)  
This course examines the law as it applies to certain private business transactions. Topics include agency, partnerships, corporations, wills, estates, trusts, personal property, real property, insurance, landlord/tenant, and legal liability of accountants. Prerequisite: ABUS 322.

344 - STATISTICAL TECHNIQUES IN ECONOMICS  
3.00 Credit(s)  
Develops analytical tools in probability, and probability distributions, estimation and hypothesis testing, Bayesian analysis, game theory and sampling techniques, with appropriate examples. Offered alternate years. Prerequisites: MATH 142 and 143.

475 - SMALL BUSINESS INSTITUTE  
3.00 Credit(s)  
A team of students is assigned to work with a small business. Supervision is provided by a faculty member. A confidential and professional relationship is maintained between the team and the client business. Course is graded S or U. May be repeated for a maximum of 9 hours. Credit earned can be used only as general elective hours. SBI credit can not be used to satisfy either major or business elective requirements. Restricted enrollment. Prerequisite: Permission of Director.

Subject - Accounting (ACCT)

231 - PRINCIPLES OF ACCOUNTING 1  
3.00 Credit(s)  
Analysis and recording of business transactions. Methodology for accumulating data on the results of economic activity. Concepts and issues of financial reporting for business entities. (Formerly ACCT 131.)

232 - PRINCIPLES OF ACCOUNTING 2  
3.00 Credit(s)  
Accounting reports for internal users of financial information. Methods of analysis underlying the provision of accounting information. Basic theory of the reporting model. (Formerly ACCT 132.) Prerequisite: ACCT 231.

233 - PRINCIPLES OF ACCOUNTING 3  
3.00 Credit(s)  
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. (Formerly ACCT 133.) Prerequisite: ACCT 232.

292 - SPECIAL TOPICS IN ACCOUNTING  
1.00 to 3.00 Credit(s)  
Can be repeated as the topic varies.

301 - INTERMEDIATE ACCOUNTING 1  
3.00 Credit(s)  

302 - INTERMEDIATE ACCOUNTING 2  
3.00 Credit(s)  
Plant assets, long-term liabilities, stockholder's equity, dilutive securities and investments. Prerequisite: ACCT 301.

303 - INTERMEDIATE ACCOUNTING 3  
3.00 Credit(s)  

314 - COST ACCOUNTING 1  
4.00 Credit(s)  

315 - COST ACCOUNTING 2  
4.00 Credit(s)  
Flexible budgets and cost behavior pattern analysis. Direct costing and responsibility accounting for management reporting. Prerequisite: ACCT 314.

387 - TAXATION OF INDIVIDUALS  
3.00 Credit(s)  
The federal income tax structure as related to individuals. Problems involving the Internal Revenue Code and Treasury Regulations pertaining to individual tax planning and reporting. Prerequisite: ACCT 233.

388 - TAXATION OF PROPERTY TRANSACTIONS AND CORPORATIONS  
3.00 Credit(s)  
The income tax consequences of various types of property transactions including sections 1231, 1245, and 1250. The federal income tax structure as related to C Corporations. Prerequisite: ACCT 387.
389 - TAXATION OF S CORPORATIONS, PARTNERSHIPS, ESTATE & GIFTS
3.00 Credit(s)
The income tax structure as related to S Corporations and Partnerships. Problems pertaining to tax planning using these tax entities. Overview of the federal estate tax and the federal gift tax. Basic tax research techniques used in a tax practice. Prerequisite: ACCT 388.

392 - ADVANCED FINANCIAL ACCOUNTING
3.00 Credit(s)
The study of various forms of business combinations and intercompany transactions, international operations including transactions and statements denominated in foreign currencies, and governmental and not-for-profit accounting. Prerequisite: ACCT 303.

402 - ACCOUNTING INFORMATION SYSTEMS
3.00 Credit(s)
A study in the use, evaluation, and design of accounting information systems. Emphasis upon the interface of accounting systems and computer technology. Prerequisite: ACCT 303.

403 - AUDITING 1
3.00 Credit(s)
A study of auditing procedures and practices of independent verification of financial records, this includes verification of the study of internal controls, audit evidence, issues of materiality and risk, and audit reports. Prerequisite: ACCT 402.

404 - AUDITING 2
3.00 Credit(s)
The study of statistical sampling in auditing, auditor's professional ethics and legal liability, and computer technology in auditing. Current issues and problems in auditing. Prerequisite: ACCT 403.

427 - INTERNSHIP IN ACCOUNTING
1.00 to 15.00 Credit(s)
Field experience in accounting. Course graded S or U. Internship experiences can be repeated for a maximum of 15 credit hours. Credit earned can be used only as general elective hours. Internship credit can not be used to satisfy either accounting or business elective requirements. Consult advisor.

477 - CPA PROBLEMS 1
2.00 Credit(s)
Application of accounting principles to hypothetical situations via in-class group participation and computerized study. Utilization of problems from past CPA examinations to develop analytical skills in financial and managerial accounting. Course graded S/U. Credit earned in this course can be used only as general elective hours. The course can not be used to satisfy either accounting or business elective requirements. Prerequisites: ACCT 303 and 315.

478 - CPA PROBLEMS 2
2.00 Credit(s)
Continuation of ACCT 477. Application of legal and auditing principles to hypothetical situations. Course graded S or U. Credit earned in this course can be used only as general elective hours. The course can not be used to satisfy either accounting or business elective requirements. Prerequisites: ABUS 322 and ACCT 477.

479 - CPA PROBLEMS 3
2.00 Credit(s)
Continuation of ACCT 477 and ACCT 478. Application of additional auditing and tax principles to hypothetical situations. Course graded S/U. Credit earned in this course can be used only as general elective hours. The course can not be used to satisfy either accounting or business elective requirements. Prerequisite: ACCT 478.

492 - SPECIAL TOPICS IN ACCOUNTING
1.00 to 3.00 Credit(s)
Can be repeated as the topic varies.

499 - INDEPENDENT STUDY IN ACCOUNTING
1.00 to 3.00 Credit(s)
An in-depth exploration of a subject of special interest to both the student and the faculty member. Class hours by arrangement. Prerequisite: Junior standing and approval of the instructor. Restricted enrollment. Permission to enroll must be obtained in writing from the faculty-mentor and the Dean of the college prior to registration.

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Subject - Economics (ECON)

100 - ECONOMICS
3.00 Credit(s)
The origins, characteristics, and functions of our economic organization, current institutional arrangements, the use of appropriate tools of economic analysis; relevant economic and social goals.

202 - PRINCIPLES OF MICROECONOMICS
3.00 Credit(s)
Economics of the individual firm in the free market economy; competitive and monopolistic markets. How prices ration goods and services to users, and the principles on which the total product is divided among the owners of the factors of production. Actual cases from business. Prerequisite: ECON 100.
203 - PRINCIPLES OF MACROECONOMICS
3.00 Credit(s)
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: ECON 100.

290 - SPECIAL TOPICS IN ECONOMICS
1.00 to 3.00 Credit(s)
Can be repeated as the topic varies.

341 - LABOR ECONOMICS
3.00 Credit(s)
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. Prerequisites: ECON 202 and 203.

348 - URBAN ECONOMICS
3.00 Credit(s)
Topics covered will include definitions of urban places and regions; origins of cities; local public finance; economics of urban housing; urban transportation; economics of crime and pollution, poverty and discrimination. Offered alternate years. Prerequisites: ECON 202 and 203.

352 - MONEY AND BANKING
3.00 Credit(s)
Theories of money and credit; commercial banking practices; reserve banking; monetary and banking laws; money market; money and credit in the world economy. Prerequisites: ECON 202 and 203.

383 - INTERMEDIATE MICROECONOMIC THEORY
3.00 Credit(s)
Special problems of pricing, production, and distribution under perfect competition, oligopoly, duopoly, and monopoly in the American economy. Prerequisites: ECON 202 and 203.

384 - INTERMEDIATE MACROECONOMIC THEORY
3.00 Credit(s)
The principles, measurement, analysis, and control of aggregate economic activity; the role of consumption, investment, and saving in achieving full employment output, economic growth and price stability. Prerequisites: ECON 202 and 203.

385 - INTERNATIONAL ECONOMICS
3.00 Credit(s)
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. Offered alternate years. Prerequisites: ECON 202 and 203.

411 - COMPARATIVE ECONOMIC SYSTEMS
3.00 Credit(s)
A comparative study of capitalism, socialism, and communism with emphasis on the economics of pricing, production, and distribution under these systems. A specific and empirical examination of these systems in actual use as in the United States, Russia, Great Britain, and China. Offered alternate years. Prerequisites: ECON 202 and 203.

423 - ECONOMICS OF THE PUBLIC SECTOR
3.00 Credit(s)
Topics include the federal budget; public good analysis, public debt issues; evaluation of tax sources for the federal, state, and local government levels; and inter-governmental fiscal relationships. Prerequisites: ECON 202 and 203.

426 - INTERNSHIP IN ECONOMICS
1.00 to 15.00 Credit(s)
Field experience in economics. Course graded S or U. Internship experiences can be repeated for a maximum of 15 credit hours. Credit earned can be used only as general elective hours. Internship credit can not be used to satisfy either economics or business elective requirements. Consult advisor.

442 - ECONOMIC HISTORY OF THE UNITED STATES
3.00 Credit(s)
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. Prerequisites: ECON 202 and 203.

443 - HISTORY OF ECONOMIC THOUGHT
3.00 Credit(s)
The development of economic thought from Greek and Hebrew writers to modern economists; Adam Smith, Malthus, Ricardo, Marx, Marshall, Keynes, and modern economists. Prerequisites: ECON 202 and 203.

490 - SPECIAL TOPICS IN ECONOMICS
1.00 to 3.00 Credit(s)
Can be repeated as the topic varies.
497 - INDEPENDENT STUDY IN ECONOMICS
3.00 to 3.00 Credit(s)
An in-depth exploration of a subject of special interest to both the student and faculty member. Class hours by arrangement. Permission must be obtained in writing from the faculty mentor and the Dean of the college prior to registration. Prerequisites: Junior standing and approval of the instructor. Restricted enrollment.

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**Subject - Finance (FINC)**

362 - MANAGERIAL FINANCE
3.00 Credit(s)
An introduction to the basic finance functions in the business firm. Specific topics include financial analysis and planning, capital budgeting, capital structure, and the management of short-term funds. Both theory and techniques are presented. Prerequisites: ECON 100 and ACCT 233.

368 - FINANCIAL PLANNING AND WORKING CAPITAL MANAGEMENT
3.00 Credit(s)
An advanced examination of planning and short term funds management within the firm. Specific topics include cash management, short-term investments, accounts receivable management, and short-term borrowing. The student is introduced to the use of the personal computer for spreadsheet analysis. Case analysis is used. Prerequisite: FINC 362.

374 - CAPITAL INVESTMENTS AND FINANCIAL DECISIONS
3.00 Credit(s)
An advanced examination of long-term financial decisions. Capital budgeting and the Capital Asset Pricing Model are given special emphasis. Lease analysis, dividend policy, and debt policy are also covered. Case analysis is used. Prerequisite: FINC 362.

421 - INTERNSHIP IN FINANCE
1.00 to 15.00 Credit(s)
Field experience in finance. Course graded S or U. Internship experiences can be repeated for a maximum of 15 credit hours. Credit earned can be used only as general elective hours. Internship credit can not be used to satisfy either finance or business elective requirements. Consult advisor.

460 - FINANCIAL INSTITUTIONS
3.00 Credit(s)
Managerial policies and decision-making concepts of commercial banks, savings and loan associations, mutual savings banks, and other financial institutions. (Formerly FINC 354.) Prerequisites: ECON 202,203; FINC 362.

461 - INVESTMENTS
3.00 Credit(s)
An examination of the vehicles, theories, and strategies of financial investment. In addition, capital markets, portfolio theory, and the Efficient Market Hypothesis receive special attention. The viewpoint of the individual investor as well as the institutional investor is considered. Prerequisite: FINC 362.

463 - RISK MANAGEMENT
3.00 Credit(s)
An explanation of the effects of pure risks on the firm and the available techniques for dealing with pure risks. The use of insurance contracts in a business setting is emphasized. Prerequisite: FINC 362 and junior standing.

494 - SPECIAL TOPICS IN FINANCE
1.00 to 3.00 Credit(s)
Can be repeated as the topic varies.

500 - INDEPENDENT STUDY IN FINANCE
1.00 to 3.00 Credit(s)
An in-depth exploration of a subject of special interest to both the student and the faculty member. Class hours by arrangement. Prerequisites: Junior standing and approval of the faculty member. Restricted enrollment. Permission to enroll must be obtained in writing from the faculty mentor and the Dean of the college prior to registration.

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**Subject - Management (MGMT)**

240 - MANAGEMENT INFORMATION SYSTEMS
3.00 Credit(s)
Study of the development, design and implementation of management information systems with introduction to the terminology, concepts and trends in computer hardware and software. Prerequisite: ACCT 233.

291 - SPECIAL TOPICS IN MANAGEMENT
1.00 to 3.00 Credit(s)
Can be repeated as the topic varies.
325 - MANAGEMENT/LABOR LAW
3.00 Credit(s)
This course examines 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 322.

330 - PRINCIPLES OF MANAGEMENT
3.00 Credit(s)
The organization of firms. Modern management methods, decision making processes, procedures, physical equipment and standards. Organization and managerial relationships of major industrial functions.

335 - MANAGEMENT ORGANIZATIONAL BEHAVIOR
3.00 Credit(s)
A study of the human factors in organizations. Emphasis placed on the contributions of the behavioral sciences to the inner workings of business firms. Topics covered are historical foundations, motivation, job satisfaction, bureaucratic structures, leadership and its development, group dynamics, social issues, communication, and international organizational behavior. Prerequisite: MGMT 330.

363 - HUMAN RESOURCE MANAGEMENT
3.00 Credit(s)
The study of the personnel field in the modern organization in dealing with the areas of recruitment, training, employee relations, compensation, health and safety, and separation. In addition, the impact of government regulations and the demands of society will also be analyzed. Prerequisite: MGMT 330.

364 - PRODUCTION AND OPERATIONS MANAGEMENT
3.00 Credit(s)
An introduction to the major issues and analytical problem solving techniques existing in the field of production and operations management. Prerequisites: FINC 362 and MGMT 330; and MATH 143.

391 - BUSINESS COMMUNICATIONS
3.00 Credit(s)
The techniques of writing business letters and reports; efficient and accurate communication of economic and business facts, presentation of conclusions for management decision-making and further study of English for self-improvement. Prerequisites: ENGL 110 and 111.

400 - CURRENT LABOR RELATIONS
3.00 Credit(s)
An in-depth study of the managerial and organizational aspects arising out of employer/union relations. Major emphasis will be placed on 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. Prerequisite: MGMT 363.

410 - BUSINESS AND SOCIETY
3.00 Credit(s)
Analysis of the complex and dynamic interrelationships between business and society through a study of the social, cultural, legal, ethical, economic and technological issues, philosophies and points of view which influence business. Topics discussed will include corporate responsibility, individual rights and multi-national business. Prerequisites: MGMT 330 and 363.

425 - INTERNSHIP IN MANAGEMENT
1.00 to 15.00 Credit(s)
Field experience in management. Course graded S or U. Internship experiences can be repeated for a maximum of 15 credit hours. Credit earned can be used only as general elective hours. Internship credit cannot be used to satisfy either management or business elective requirements. Consult advisor.

474 - SMALL BUSINESS MANAGEMENT
3.00 Credit(s)
A survey of the importance of small business, its current status, problems encountered and requirements for successful operations. Emphasis being given to problem solving techniques for small businesses. Prerequisites: ABUS 322, MGMT 330, MRKT 351, FINC 362 and MATH 143.

485 - BUSINESS POLICY AND STRATEGY
3.00 Credit(s)
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 ECON 202 and 203, ABUS 322, MGMT 330, MRKT 351 and FINC 362.
486 - INTERNATIONAL MANAGEMENT
  3.00 Credit(s)
This course will deal with an exploration of the myriad of changes and trends that have impacted on worldwide businesses as they have evolved in the past several decades. Analysis and study will be made of the probable effects of these changes on both domestic and international firms from a global perspective. A basic assumption is made that a central concern of all international management will lie in the cumulative effect of the accelerating change to a truly global economy. Individual decision and collective industry expansions across international boundaries during the regular course of their operations will also be explored. Prerequisites: ECON 202,203; FINC 362; MGMT 330 and 363; MRKT 351.

491 - SPECIAL TOPICS IN MANAGEMENT
  1.00 to 3.00 Credit(s)
Can be repeated as the topic varies.

498 - INDEPENDENT STUDY IN MANAGEMENT
  1.00 to 3.00 Credit(s)
An exploration in depth of a subject of special interest to both the student and the faculty member. Hours by arrangement. Prerequisites: Junior standing and approval of the instructor. Restricted enrollment. Permission to enroll must be obtained in writing from the faculty-mentor and the Dean of the college prior to registration.

372 - ADVERTISING
  3.00 Credit(s)
Advertising as an integral part of the marketing process; selling appeals and types of advertising; consideration of copy and media; problems of publishing and broadcast advertising. Prerequisite: MRKT 351.

373 - LOGISTICS
  3.00 Credit(s)
Water, railway, highway, pipeline and air transportation and their development in the U.S.; rates and their effect on location and development of industry; government regulations; and labor relations. Prerequisites: MGMT 330; MRKT 351.

375 - MERCHANDISING
  3.00 Credit(s)
The principles of the specialized area of merchandising as compared to the general study of marketing. Store location, layout, pricing for profit, markups, markdowns, inventory control methods and the duties of a buyer will be investigated in detail. Prerequisite: MRKT 370.

376 - INDUSTRIAL MARKETING
  3.00 Credit(s)
A study of the basic industrial marketing system as distinguished from consumer marketing. The demand for industrial goods and the nature of the consumer is analyzed in detail. Topics discussed will include characteristics of manufacturer's goods, channels of distribution, pricing, vendor and value analysis, industrial buying, industrial advertising and meeting product specifications. Prerequisite: MRKT 351.
420 - INTERNSHIP IN MARKETING  
1.00 to 15.00 Credit(s)  
Field experience in marketing. Course graded S or U. Internship experiences can be repeated for a maximum of 15 credit hours. Credit earned can be used only as general elective hours. Internship credit cannot be used to satisfy either marketing or business elective requirements. Consult advisor.

434 - MARKETING RESEARCH  
3.00 Credit(s)  
Research design, data collection methods, sampling techniques, tabulation and analysis of information concerning problems in marketing. Prerequisite: MRKT 351.

451 - ADVANCED MARKETING  
3.00 Credit(s)  
Marketing decision making, interacting with the various functions of marketing to better develop marketing strategies by defining target markets and constructing marketing mixes. Prerequisites: MRKT 351, 375 and 434; MGMT 330; FINC 362; and senior standing.

452 - CONSUMER BEHAVIOR  
3.00 Credit(s)  
The course is an examination of the broad field of how consumers behave as individuals, families, and in group situations. Consumer behavior draws upon the knowledge from the areas of sociology, economics, and psychology, yet consumer behavior has developed a discipline of its own. The consumers' behavior is pertinent to marketing managers who make decisions regarding environmental analysis, product positioning, segmentation of markets, and in developing a marketing strategy. Prerequisite: MRKT 351.

493 - SPECIAL TOPICS IN MARKETING  
1.00 to 3.00 Credit(s)  
Can be repeated as the topic varies.

496 - INDEPENDENT STUDY IN MARKETING  
1.00 to 3.00 Credit(s)  
An exploration in depth of a subject of special interest to both the student and the faculty member. Hours by arrangement. Prerequisites: Junior standing and approval of the instructor. Restricted enrollment. Permission to enroll must be obtained in writing from the faculty-mentor and the Dean of the college prior to registration.
THE THOMAS JEFFERSON SMULL COLLEGE OF

Engineering

Bruce E. Burton, Dean

Accreditation and Association

The Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), the only official accrediting agency for engineering curricula, has accredited curricula in civil, electrical, and mechanical engineering. The College is a member of the American Society for Engineering Education and is recognized by the Ohio Board of Registration for Professional Engineers and Surveyors.

History and Tradition

In 1871 the first catalog of the University included a course in surveying. A department of Civil Engineering was organized in 1880 with its first graduate in 1882, Electrical Engineering in 1898, and Mechanical Engineering in 1904. Over 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 1992-93 recipient is Dr. Robert Ward, assistant professor of civil engineering.

Engineering Alumni Chair established in 1983 by donations from engineering alumni and friends in celebration of the College's Centennial year. The 1992-93 recipient of the chair is Dr. Leslie Thede, professor of electrical engineering.

Leroy H. Lytle Distinguished Chair of Mechanical Engineering established in 1983 from the estate of Leroy H. Lytle, 1923 graduate of ONU. The 1992-93 recipient of the chair is Professor Richard Cowan, associate professor of mechanical engineering.

Departments

There are three departments in the College of Engineering: civil engineering, electrical engineering, and mechanical engineering.

Mission Statement

The basic mission of the college is to develop in students a genuine competence in an orderly way of analytical thinking so that the students learn individually to think and to solve problems. The college follows the mission of the University in developing the students as whole individuals who will be successful and creative in their professions as well as in their personal lives. All students are encouraged to attain academic excellence in the subject matter basic to engineering and to continue excellence in their chosen branch of the engineering profession.

Admission Standards

Early application is advisable. As early as the junior year of high school the student interested in engineering is encouraged to obtain advice on program of study from the dean of the college and to request appropriate information and application materials from the Office of Admissions, Ohio Northern University, Ada, 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 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.

The dean admits special students who are non-degree candidates if, after a personal interview, it is determined that they are sufficiently prepared to pursue engineering courses successfully.

Degree Requirements
Bachelor of Science degree in civil, electrical, or mechanical engineering.

General Education Requirements
The following lists the prescribed general education courses required of all students.

English
Writing 110 and 111

Communication Arts
Technical Communications 390

Humanities
Great Works of Literature 204
One course selected from Philosophy 100, Great Philosophers 102, Knowledge and Truth 237, Ethics 238, Social Justice 320, or Philosophy and Religion 325.
One course selected from Art 100, Music 100, Theater 105, Western Civilization I 110, Western Civilization II 111, U.S. History 211, 212, 213, or History of Ohio 303.
One course, 200 level or above selected from any of the above subject areas under Humanities.

Social Science
Three courses selected from Economics 100, 202, 203, Psychology 100, Sociology 105, Political Science 105, 201, 202, 203. One course, 200 level or above, selected from any of the above course areas under Social Science.

Mathematics
The following courses are required of all engineering students: Calculus 163, 261, 262, 263, Linear Algebra 272, and Differential Equations 361.

Science
The following courses are required of all engineering students: Physics 231, 232, 233, 234, 235, 236, Chemistry 162 and 163.

Civil Engineering
The following engineering courses are required for a Bachelor of Science in Civil Engineering.

201103 Creative Design or 201105 Computer-aided Design
201104 Fundamentals of Computer-aided Drafting
201120 Seminar for Engineering Students
201130 Introduction to Computing for Engineers
201230 FORTRAN for Engineers
201311 Statics
201312 Dynamics
201313 Mechanics of Materials 1
201321 Passive & Active Circuits 1
201322 Passive & Active Circuits 2
201332 Circuits Laboratory 1
201401 Probability and Statistics for Engineers
201402 Engineering Material Science
201403 Material Science Laboratory
201404 Mechanics of Materials 2
201405 Mechanics of Materials 2 Laboratory
202301 Surveying
202411 Numerical Analysis
202412 Structural Analysis 1
202413 Structural Analysis 2
202422 Fluid Mechanics
202423 Hydraulics
202435 Transportation
202436 Urban Planning
202453 Geology
202511 C.E. Design Project 1
202512 C.E. Design Project 2
202514 Environmental Engineering 1
202516 Environmental Engineering 2
202525 Reinforced Concrete 1
202526 Reinforced Concrete 2
202531 Soils 1
202532 Soils 2
202542 Engineering Economy
202547 Steel Design 1
202548 Steel Design 2
202551 Civil Engineering Seminar
202555 Finite Element Analysis
Two technical elective courses.
**Electrical Engineering**

The following engineering courses are required for a Bachelor of Science in Electrical Engineering:

- 201103 Creative Design or 201105 Computer-aided Design
- 201104 Fundamentals of Computer-aided Drafting
- 201120 Seminar for Engineering Students
- 201130 Introduction to Computing for Engineers
- 201230 FORTRAN for Engineers
- 201311 Statics
- 201312 Dynamics
- 201313 Mechanics of Materials 1
- 201321 Passive & Active Circuits 1
- 201322 Passive & Active Circuits 2
- 201323 Passive & Active Circuits 3
- 201332 Circuits Laboratory 1
- 201333 Circuits Laboratory 2
- 201401 Probability and Statistics for Engineers
- 203326 Digital Electronics 1
- 203383 Digital Electronics Lab 1
- 203401 Engineering Analysis
- 203412 Fields 1
- 203413 Fields 2
- 203424 Analog Electronics 1
- 203425 Analog Electronics 2
- 203433 Energy Conversion 1
- 203442 Linear Systems 1
- 203443 Linear Systems 2
- 203453 Analog Electronics
- 203456 Filter Design
- 203471 Electrical Laboratory 1
- 203481 Analog Electronics Laboratory 1
- 203482 Analog Electronics Laboratory 2
- 203502 Engineering Methods 1
- 203514 Digital Signal Processing
- 203524 Digital Electronics 2
- 203525 Digital Electronics 3
- 203531 Energy Conversion 2
- 203541 Control Systems 1
- 203542 Control Systems 2
- 203561 Electrical Laboratory 5
- 203564 Senior Electrical Design 1
- 203565 Senior Electrical Design 2
- 203566 Senior Electrical Design 3
- 203572 Electrical Laboratory 7
- 203582 Communication Theory 1
- 203583 Communication Theory 2
- 203584 Communications Lab

One E.E. elective
One technical elective

**Mechanical Engineering**

The following engineering courses are required for a Bachelor of Science in Mechanical Engineering:

- 201103 Creative Design or 201105 Computer-aided Design
- 201104 Fundamentals of Computer-aided Drafting
- 201120 Seminar for Engineering Students
- 201130 Introduction to Computing for Engineers
- 201230 FORTRAN for Engineers
- 201311 Statics
- 201312 Dynamics
- 201313 Mechanics of Materials 1
- 201321 Passive & Active Circuits 1
- 201322 Passive & Active Circuits 2
- 201323 Passive & Active Circuits 3
- 201332 Circuits Laboratory 1
- 201333 Circuits Laboratory 2
- 201401 Probability and Statistics for Engineers
- 201402 Engineering Material Science
- 201403 Material Science Laboratory
- 201404 Mechanics of Materials 2
- 201405 Mechanics of Materials 2 Laboratory
- 204403 Manufacturing Processes
- 204405 Theory of Machines 1
- 204406 Theory of Machines 2
- 204415 Thermodynamics 1
- 204416 Thermodynamics 2
- 204424 Analytical Methods
- 204426 Fluid Mechanics 1
- 204435 Engineering Analysis
- 204444 Computer Graphics
- 204445 Finite Element Analysis
- 204511 Mechanical Design 1
- 204512 Mechanical Design 2
- 204513 Mechanical Design 3
- 204521 Heat Transfer 1
- 204522 Heat Transfer 2
- 204526 Energy Systems
- 204534 Fluid Mechanics 2
- 204541 Vibration Analysis
- 204542 Control Systems

One technical elective
One science elective

**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 of 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, taking at least 45 quarter hours of upper level engineering courses.

At commencement engineering students receive the bachelor of science degree in either civil, electrical, or mechanical engineering.

**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. 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. Each engineering student is responsible for fulfilling the requirements for the current year’s catalog as they apply to that year of the program.

**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 50 quarter hours of completed academic work; for junior standing, 100 quarter hours; and for senior standing, 150 quarter hours.

**Academic Status**

A student is in good academic standing when the accumulative grade point average is at least 2.00 or when it has been granted by the petition process.

A student is placed on academic probation the first time the accumulative grade point average falls below 2.00. Normally one quarter is given to raise the accumulative average to an acceptable level. A student may be on probation two successive quarters if conditions and evidence indicate that the student is improving academically.

A student who consistently attains a low accumulative average (below 2.00) or extremely low scholarship in a given quarter is subject to suspension, which implies the possibility of readmission at a later date, usually after three quarters.

A student having academic difficulty is required to meet frequently with the advisor. A student on probation is not eligible to participate in extracurricular activities.

**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 automatically 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.

**Arts-Engineering Curricula**

Superior students may qualify to pursue the arts-engineering program. Students are admitted to both the College of Arts and Sciences and the College of Engineering and may earn the appropriate bachelor’s degree from the College of Arts and Sciences and a bachelor of science degree in the appropriate branch of engineering from the College of Engineering. The attraction of the dual degree five-year program is that a student is free to major in any arts and sciences area and in any branch of engineering.
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 employment sessions begin in the summer following the sophomore year and are alternated with study sessions until the student has completed his junior academic year. This five-year program is optional and currently available for civil, electrical, and mechanical engineering students.

General Engineering

No sharp line of distinction is drawn in the fundamental education of civil, electrical, or mechanical engineers for the reason that the sciences basic to engineering — mathematics, physics, chemistry, and the engineering sciences — are essential in all branches of engineering. Since certain courses in engineering are considered to be fundamental and deal with the basics of the several fields, they are used by all three departments in at least the first two years of the curriculum. Courses under General Engineering are taught by the engineering faculty and are required of all engineering students in at least two of the three departments.

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*The following schedule is typical; however, the quarter in which certain courses are taken may vary.

**ALL ENGINEERING — CLASS OF 1997

<table>
<thead>
<tr>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
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</thead>
<tbody>
<tr>
<td>Writing 1, Philosophy, Writing 2 (112110, 115, ... , 112111)</td>
<td>3</td>
<td>3</td>
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<tr>
<td>Calculus 1, 2, 3 (123163-261-2)</td>
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<td>4</td>
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<tr>
<td>Freshman Seminar, Physics 1, 3 (201120, 124231-3)</td>
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<td>5</td>
</tr>
<tr>
<td>Intro Comp Engrs., Fund-CAD, Comp Aided Dsgn* (201130-104-5)</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Social Science Electives (...., ....)</td>
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<td>3</td>
</tr>
<tr>
<td>Humanities Elective, Religion (...., 115...)</td>
<td></td>
<td>3</td>
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<tr>
<td>Totals</td>
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<td>17</td>
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</tbody>
</table>

*Creative Design (201103) may be substituted for Computer Aided Design (201105).

**ALL ENGINEERING — CLASS OF 1996

<table>
<thead>
<tr>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
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<tbody>
<tr>
<td>Calculus 4, Linear Algebra, Differential Equations (123263-272-361)</td>
<td>4</td>
<td>4</td>
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<tr>
<td>Physics 2, Chemistry (124232, 122162-3)</td>
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<td>5</td>
</tr>
<tr>
<td>Social Science Elective, FORTRAN for Engineers, Great Works*** (...., 201230, 112204)</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Statics, Dynamics, Mech. of Mtls. 1 (201311-2-3)</td>
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<td>3</td>
</tr>
<tr>
<td>P&amp;A Circuits 1, 2, 3** (201321-2-3)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Circuits Lab. 1, 2** (201332-3)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>TOTALS</td>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>

**Circuits 3 and Circuits Lab 2 are required for students in electrical engineering and mechanical engineering; students in civil engineering should substitute Surveying.

***Electrical engineering students substitute Digital Electronics 1 and Digital Electronics Lab 1 in place of Great Works.
Interdisciplinary Programs

In addition to the regular degree programs in civil, electrical, and mechanical engineering, three interdisciplinary programs have been developed. They are an Option in Business Administration, a Minor in Computer Science, and an Option in Environmental Engineering. The first two programs work equally well with any of the three degree programs while the third 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. A minimum of 30 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 Psychology, three courses in Economics, three courses in Accounting, Principles of Management, Business Law, Marketing, and Managerial Finance.

In the Computer Science Minor the courses required are Introduction to Programming, FORTRAN Programming, Intermediate Programming, Programming Environments, Assembly Language Programming, Computer Graphics, and two upper level computer science electives.

The Environmental Option includes three courses in the biological sciences, three in chemistry and six engineering courses which focus on various aspects of the environment.

DEPARTMENT OF GENERAL ENGINEERING

(Department 201)

Subject - General Engineering (GE) –

103 - CREATIVE DESIGN (0+4)
2.00 Credit(s)
Participation in student-generated group design projects, emphasizing engineering methodology, design, analysis, and communicative skills. Prerequisite: GE 104.

104 - FUNDAMENTALS OF COMPUTER-AIDED DRAFTING (0+4)
2.00 Credit(s)
An introduction to a computer-aided drafting system using a personal computer. Construction of 2-dimensional drawings of parts and reading of drawings. Use of features in AUTOCAD software, printers and plotters. Creation of 3-view orthographic projections, 3-dimensional isometric views and assembly drawings. Manual sketching of parts is also taught.

105 - COMPUTER-AIDED DESIGN (1+2)
2.00 Credit(s)
Introduction to engineering design applications using a personal computer. Emphasis on design layout, detail, and assembly drawing. Dimensions, tolerancing, and thread design performed. Electrical schematic drawings designed. Prerequisite: GE 104.

120 - SEMINAR FOR ENGINEERING STUDENTS (1+0)
1.00 Credit(s)
Preparation of schedules, graduation requirements, study skills, library, Communication Skills Center are covered. Visiting lecturers provide insight into the engineering profession.

130 - INTRODUCTION TO COMPUTING FOR ENGINEERS (0+2)
2.00 Credit(s)
Introduction to the ONU computer. Engineering problem solving using the computer. Introduction to spreadsheets, data bases and word processing.

230 - FORTRAN FOR ENGINEERS (2+0)
2.00 Credit(s)
Concentrated study of the FORTRAN 77 language. Engineering application programs designed in FORTRAN 77. Prerequisite: GE 130.
291 - INDEPENDENT STUDY AND PROJECTS
1.00 to 3.00 Credit(s)
Independent planning of an engineering or engineering-related project or independent study at the freshman level on topics of particular interest to the student and approved by the faculty. Prerequisite: Permission of instructor.

292 - INDEPENDENT STUDY AND PROJECTS
1.00 to 3.00 Credit(s)
Continuation of GE 291.

293 - INDEPENDENT STUDY AND PROJECTS
1.00 to 3.00 Credit(s)
Continuation of GE 292.

300 - ORIENTATION FOR CO-OP STUDENTS
1+0 .00 Credit(s)
Introduction to the co-op program. Includes 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 status with cum GPA of 2.5.

311 - STATICS (3+0)
3.00 Credit(s)
Fundamental principles of statics with vector methods. Emphasis on free body diagrams and equations of equilibrium. Topics include: resultants of force systems, centroids and centers of gravity, equilibrium, friction and moment of inertia. Prerequisites: MATH 261 and PHYS 231.

312 - DYNAMICS (3+0)
3.00 Credit(s)
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. Prerequisite: MATH 262 and GE 311.

313 - MECHANICS OF MATERIALS 1 (3+0)
3.00 Credit(s)
Elastic analysis using concepts of stress and strain, tension, torsion, compression and flexure, development and application of Mohr's circle; analytical methods of determining stresses in members subjected to torsional and flexural loading; shear and moment diagrams. Prerequisite: GE 311.

321 - PASSIVE AND ACTIVE CIRCUITS 1 (3+0)
3.00 Credit(s)
Introductory concepts in circuit analysis. Solution of resistive circuits using Ohm's and Kirchhoff's Laws, mesh and nodal analysis, and network theorems. Prerequisites: MATH 261; PHYS 233; or permission of instructor.

322 - PASSIVE AND ACTIVE CIRCUITS 2 (3+0)
3.00 Credit(s)
Analysis of transient and steady-state circuits. Phasor solutions, effective values of current and voltage, and instantaneous and average power. Prerequisite: GE 321.

323 - PASSIVE AND ACTIVE CIRCUITS 3 (3+0)
3.00 Credit(s)
Sinusoidal steady state power analysis, balanced three phase systems, mutual inductance, parallel and series resonance. Prerequisite: GE 322.

332 - CIRCUITS LABORATORY 1 (0+2)
1.00 Credit(s)
A laboratory study of electric circuits. Concurrent: GE 322.

333 - CIRCUITS LABORATORY 2 (0+2)
1.00 Credit(s)
Continuation of GE 332. Concurrent: GE 332.

391 - INDEPENDENT STUDY AND/OR PROJECTS
1.00 to 3.00 Credit(s)
Independent planning of an engineering or engineering-related project or independent study at the sophomore level on topics of particular interest to the student and approved by the faculty. Prerequisite: Permission of instructor.

392 - INDEPENDENT STUDY AND/OR PROJECTS
1.00 to 3.00 Credit(s)
Continuation of GE 391.

393 - INDEPENDENT STUDY AND/OR PROJECTS
1.00 to 3.00 Credit(s)
Continuation of GE 392.

401 - PROBABILITY AND STATISTICS FOR ENGINEERS (3+0)
3.00 Credit(s)
Probability and its application to engineering problems. Random processes in engineering, distribution, regression analysis, and analysis of variance. Prerequisite: MATH 262.
402 - ENGINEERING MATERIAL SCIENCE (3+0)  
3.00 Credit(s)  
A study of the 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 of metals including equilibrium diagrams. Prerequisite: CHEM 162.

403 - MATERIAL SCIENCE LABORATORY (0+2)  
1.00 Credit(s)  
A laboratory study of material science. Taken concurrently with or subsequent to GE 402.

404 - MECHANICS OF MATERIALS 2 (3+0)  
3.00 Credit(s)  
Beam deflection-determinate and indeterminate, column stability, dynamic loading, and energy methods. Prerequisites: MATH 361 and GE 313.

405 - MECHANICS OF MATERIALS 2 LABORATORY (0+2)  
1.00 Credit(s)  
A laboratory study of mechanics of materials. To be taken concurrently with or subsequent to GE 404.

411 - PROFESSIONAL PRACTICE 1  
1.00 Credit(s)  
Employment in a semiprofessional capacity in 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. Prerequisite: Junior status and successful completion of GE 300.

412 - PROFESSIONAL PRACTICE 2  
1.00 Credit(s)  
Continuation of GE 411. Prerequisite: GE 411.

413 - PROFESSIONAL PRACTICE 3  
1.00 Credit(s)  
Continuation of GE 412. Prerequisite: GE 412.

414 - PROFESSIONAL PRACTICE 4  
1.00 Credit(s)  
Continuation of GE 413. Prerequisite: GE 413.

415 - PROFESSIONAL PRACTICE 5  
1.00 Credit(s)  
Continuation of GE 414. Prerequisite: GE 414.

416 - PROFESSIONAL PRACTICE 6  
1.00 Credit(s)  
Continuation of GE 415. Prerequisite: GE 415.
DEPARTMENT OF CIVIL ENGINEERING

(Department 202)

Professors Milks, Minich (Chair), Shah; Associate Professor Smalley; Assistant Professor Ward; Adjunct Professor Brewer.

Civil engineering deals with the design, construction, operation, and impacts of man's civil works. Consequently, the quality of its graduates is a major factor influencing the health, safety, and life quality enjoyed by the nation's citizenry. The practice of civil engineering requires a broad background in the biological, chemical, geological, mathematical, and physical sciences; understanding of social value systems, human behavior, and our cultural heritage; and in-depth education in the traditional civil engineering discipline.

Department facilities include instruments and equipment in functional laboratories. Laboratory work is offered in testing materials, concrete, soils, geology, fluid mechanics, environmental engineering, and hydraulics, as well as field work in surveying.

The courses which are shown with an asterisk (*) may have substitutions. The technical electives allow the student to have some flexibility to design a program to meet particular needs.

Students must demonstrate an ability in design. Civil Engineering design is the process of devising a system, component, or process to meet desired needs. It is a decision-making process (often iterative) in which the basic sciences, mathematics, and engineering sciences are applied to convert resources optimally to meet a stated objective. Among the fundamental elements of the process are the establishment of objectives and criteria, synthesis, analysis, construction, testing, and evaluation. The design process will be demonstrated in several courses, particularly in the senior year.

Subject - Civil Engineering (CE) ———

301 - SURVEYING (2+4)
4.00 Credit(s)
Use of level, transit and tape, differential and profile leveling, traversing theory and practice, horizontal and vertical curves, and mapping. Prerequisite: Permission of instructor.

411 - NUMERICAL ANALYSIS (3+0)
3.00 Credit(s)
Principles of numerical analysis used in solving civil engineering problems, numerical methods, linear programming, optimization and applications. Prerequisites: MATH 272 and GE 404.

412 - STRUCTURAL ANALYSIS 1 (3+0)
3.00 Credit(s)
Fundamentals of statically determinate structures, deflections, displacements, use of models to illustrate structural behavior, principle of superposition and study of elastic curve. Prerequisite: GE 404.

413 - STRUCTURAL ANALYSIS 2 (3+0)
3.00 Credit(s)
Fundamentals of statically indeterminate structures; classical and approximate methods of solution, computer aspects. Prerequisite: CE 412.

422 - FLUID MECHANICS (2+2)
3.00 Credit(s)
Engineering properties of fluids, fluid statics, fluid dynamics, fluid resistance, boundary layer theory, steady flow in pipes. Laboratory periods will be used for experiments, films and problem solving. Prerequisite: GE 312.

423 - HYDRAULICS (3+2)
4.00 Credit(s)
Prerequisite(s): CE- 422
Hydraulic analysis of piping systems to include friction losses and minor losses. Other topics include pump design, hydraulics of wells, water hammer, hydraulic structures and flow measurement. Design of a water distribution system is included. Field trips when appropriate. Laboratory periods will be used for experiments, films, project and problem solving. Prerequisite: CE 422.

435 - TRANSPORTATION (3+0)
3.00 Credit(s)
Principles of transportation systems; economics, finance, and planning; and design, construction and maintenance. Field trips when appropriate. Prerequisite: Permission of instructor.

436 - URBAN PLANNING (3+0)
3.00 Credit(s)
Principles of city and regional planning; land use, zoning, housing codes, subdivision regulations, metropolitan problems, and urban development. Field trips when appropriate. Prerequisite: Permission of instructor.
442 - LAW AND MANAGEMENT (3+0)
3.00 Credit(s)
Present and emerging legal issues concerning various aspects of the Civil Engineering profession. The organization, management and control of a business enterprise. Organization and management systems. Prerequisite: Junior standing.

453 - GEOLOGY (3+2)
4.00 Credit(s)
Principles of physical geology. Physical and chemical properties of minerals and rocks, geologic processes, earth materials, processes of erosion and deposition, terrain investigation, geological mapping, ground water hydrology. Field trips when appropriate. Prerequisite: Permission of instructor.

474 - SOLID WASTES (2+2)
3.00 Credit(s)
Sources of solid wastes, collection, transportation and disposal. Selection of disposal sites and design of disposal facilities. Visits to area disposal facilities. Prerequisites: BIOL 112 and CHEM 163.

475 - HAZARDOUS AND TOXIC WASTES (2+2)
3.00 Credit(s)
Sources of wastes, their collection, transportation, and disposal. Methods of treatment and design of related facilities. Discussion of cases. Prerequisite: CE 474.

491 - INDEPENDENT STUDY IN CIVIL ENGINEERING
1.00 to 3.00 Credit(s)

495 - SPECIAL TOPICS IN CIVIL ENGINEERING
1.00 to 4.00 Credit(s)

511 - C.E. DESIGN PROJECT 1 (3+0)
3.00 Credit(s)
Philosophy of engineering design stressing relationship to society; definition of the design problem and evaluation of the problem economically, sociologically, and on an engineering basis. Selection of a project and beginning of its design under the guidance of a professor or professors. First of a three course sequence as a capstone design project.

512 - C.E. DESIGN PROJECT 2 (3+0)
3.00 Credit(s)
A continuation of CE Design Project 1 under the specific guidance of a faculty member. Prerequisite: CE 511.

514 - ENVIRONMENTAL ENGINEERING 1 (2+2)
3.00 Credit(s)
Development of sources of water supply including hydrologic analysis, determination of water needed and waste water generated; open channel analysis and design of a wastewater collection system. Field trips when appropriate. Prerequisite: CE 423.

516 - ENVIRONMENTAL ENGINEERING 2 (3+3)
4.00 Credit(s)
Physical, chemical and biological processes in water and waste water treatment systems. Design of a treatment system. Land and air pollution; control and standards; interpretation of reports; inspection of local plants. Solid waste problems. Field trips when appropriate. Prerequisite: CE 514.

518 - ENVIRONMENTAL ENGINEERING 3
3.00 Credit(s)
Advances in water and wastewater treatment. Removal of specific constituents. Effects and overview of the available types of unit operations, processes and flowsheet for the removal of contaminants of concern are identified and detailed operations and processes are applied to the specific constituents. Prerequisite: CE 516.

525 - REINFORCED CONCRETE 1 (3+2)
4.00 Credit(s)
Strength design of structural elements, flexural reinforcement development, diagonal tension, axially and eccentrically loaded columns, torsion, walls, footings; application of codes and specifications to design. Field trips when appropriate. Prerequisite: CE 413.

526 - REINFORCED CONCRETE 2 (2+2)
3.00 Credit(s)
Continuity, slabs, deflections, and economic considerations. Hydraulic cement and asphaltic cement will be investigated in the laboratory. Field trips when appropriate. Prerequisite: CE 525.

531 - SOILS 1 (3+2)
4.00 Credit(s)
An introduction to soils engineering, physical properties of soils as affecting engineering design and construction, soil sampling, mechanics of soil masses, consolidation, settlement, and laboratory soil tests. Field trips when appropriate. Prerequisites: CE 423 and 453.
532 - SOILS 2 (4+2)
5.00 Credit(s)
Analysis of stress conditions imposed on the supporting soils by foundations. Design of foundations, retaining structures and slopes. Field trips when appropriate. Prerequisite: CE 531.

542 - ENGINEERING ECONOMY (3+0)
3.00 Credit(s)
Engineering decision-making, cash flow, equivalency, analysis by present worth, annual cash flow, rate of return and incremental; depreciation; taxes; replacement; inflation and deflation. Permission of instructor.

547 - STEEL DESIGN 1 (3+2)
4.00 Credit(s)
Structural steel properties. Design of members for tension, compression, flexure and combined loads. Field trips when appropriate. Prerequisite: CE 413.

548 - STEEL DESIGN 2 (3+0)
3.00 Credit(s)
Design of connections, plate girders, composite design, fatigue, and load and resistance factor design. Prerequisite: CE 547.

551 - CIVIL ENGINEERING SEMINAR (3+0)
3.00 Credit(s)
Oral presentation of project completed in C.E. Design Projects 1 and 2. Active participation in class discussion required. Field trips when appropriate. Current topics of general Civil Engineering interest not covered in curriculum. Prerequisite: CE 512.

555 - FINITE ELEMENT ANALYSIS (3+0)
3.00 Credit(s)
Development of the finite element method as applied to various topics from continuum mechanics. Areas covered include plane, axisymmetric, curved plate, shell and brick elements, 3-dimensional problems, seepage, heat transfer, fluid mechanics, transient problems and geometric and material nonlinearity. Solution algorithms for linear and nonlinear static and dynamic analysis. Use of large scale production computer programs. Prerequisite: Permission of instructor.

591 - INDEPENDENT STUDY IN CIVIL ENGINEERING
1.00 to 3.00 Credit(s)

595 - SPECIAL TOPICS IN CIVIL ENGINEERING
1.00 to 4.00 Credit(s)

CIVIL ENGINEERING—CLASS OF 1995
Junior 1993-94
Mechanics of Materials 2, Law & Mgmt*, Geology (201404, 202442-453)
Engr. Mtl. Sc., Str. Analy. 1,2 (201402, 202412-3)
Engr. Mtl. Sc. Lab (201403)
Urban Planning, Transportation,
Numerical Analy. (202436-435-411)
Social Science Elective, Fluid Mechanics,
Hydraulics (202422-3)
Humanities Elective, Prob. & Stat. for
Engrs., Tech Communication,
(201401, 153390)
TOTALS

CIVIL ENGINEERING—CLASS OF 1994
Senior 1993-94
Environ. Engr 1, 2 (202514-16)
Steel Design 1, 2, Finite Element Analy.
(202547-8-555)
Soils 1, 2, Technical Elective* (202531-2-551)
C.E. Design Project 1, 2, C.E. Seminar
(202511-2-551)
Engr. Economy, Reinforced Concrete 1, 2
(202545-525-6)
TOTALS

Fall Winter Spring

4 3 4
3 3 3
1 1 1
3 3 3
3 3 4
16 16 17
3 3 3

*Acceptable Technical Electives: Law & Management, 202422; Solid Wastes, 202474; Hazardous and Toxic Wastes, 202475; Environmental Engineering 3, 202418; Thermodynamics 1, 204415
DEPARTMENT OF ELECTRICAL ENGINEERING

(Department 203)

Professors Carmean, Johansen, Stahl, Theede; Associate Professors Grismore (Chair), Herr

Electrical engineers have long pioneered the fields of power, automatic control, communications, and computers. Without controlled electricity, industry as we know it today could not exist. The ever-expanding use of electrical means for measurement, control, and computation has resulted in the need for electrical engineers in a variety of diverse and rapidly expanding areas — research institutes, developmental laboratories, manufacturing facilities, government service, medical facilities, computing centers, utility companies, consulting firms, etc.

The electrical engineering curriculum coordinates scientific background with technical knowledge. This curriculum is designed to provide a background for students who intend to pursue employment in the above mentioned areas or to pursue specialized work in graduate school. Classroom activities are supplemented by work in well-equipped laboratories. Problem solving and laboratory experience are emphasized.

### ELECTRICAL ENGINEERING—CLASS OF 1995

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<td>Prob. &amp; Stat. for Engrs., Linear Systems 1, 2 (201401, 203442-3)</td>
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<td>Social Science, Tech Communication (. . . . , 153390)</td>
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### ELECTRICAL ENGINEERING—CLASS OF 1994

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* Electives approved by the Department Chair.
Subject - Electrical Engineering (EE)

326 - DIGITAL ELECTRONICS 1 (3+0)
3.00 Credit(s)
Introduction to the features of the design and performance of digital IC's and their use in implementing logic designs. Prerequisite: GE 322.

383 - DIGITAL ELECTRONICS LAB 1 (0+3)
1.00 Credit(s)

401 - ENGINEERING ANALYSIS (4+0)
4.00 Credit(s)
Selected analytical methods with engineering applications. Emphasis is on methods using complex variables and vector calculus. Prerequisite: MATH 361.

412 - FIELDS 1 (4+0)
4.00 Credit(s)
Electromagnetic field theory with applications relevant to electrical engineering. Emphasis on static and quasi-static electromagnetic fields. Prerequisite: EE 401.

413 - FIELDS 2 (3+0)
3.00 Credit(s)
Continuation of EE 412 with emphasis on electromagnetic wave phenomena. Prerequisite: EE 412.

424 - ANALOG ELECTRONICS 1 (4+0)
4.00 Credit(s)
Operating principles of electronic devices, models representing these devices and their use in simple circuitry. Prerequisite: GE 323.

425 - ANALOG ELECTRONICS 2 (4+0)
4.00 Credit(s)
Large and small signal amplifiers, frequency response of amplifiers and oscillators. Prerequisite: EE 424.

433 - ENERGY CONVERSION 1 (3+0)
3.00 Credit(s)
Energy conversion with emphasis on direct current and alternating current machinery. Co-requisite: EE 413.

442 - LINEAR SYSTEMS 1 (3+0)
3.00 Credit(s)
Analysis of linear signals and systems including time domain and Laplace Transform techniques. Prerequisites: GE 323 and EE 401.

443 - LINEAR SYSTEMS 2 (3+0)
3.00 Credit(s)
A continuation of EE 442. Analysis of continuous and discrete signals and systems using frequency domain and discrete domain methods. Prerequisite: EE 442.

453 - ANALOG ELECTRONICS (3+0)
3.00 Credit(s)
The study of feedback amplifiers and specialized linear integrated circuits such as timers, phase locked loops and voltage regulators. Prerequisite: EE 425.

456 - FILTER DESIGN
3.00 Credit(s)
The study of analog active filters using op-amps and the introduction of digital filtering concepts. Prerequisite: EE 442. Co-requisite: EE 443.

471 - ELECTRICAL LABORATORY 1 (0+3)
1.00 Credit(s)
Instrumentation and measurement circuits and techniques. Prerequisite: GE 323.

481 - ANALOG ELECTRONICS LAB 1 (0+3)
1.00 Credit(s)
Study of active devices and their associated circuits. (Formerly EE 452.) Co-requisite: EE 424.

482 - ANALOG ELECTRONICS LAB 2 (0+3)
1.00 Credit(s)
Continuation of EE 481. Co-requisite: EE 425.

502 - ENGINEERING METHODS 1 (3+0)
3.00 Credit(s)
The basic fundamentals of engineering economics with application to electrical systems. Prerequisite: EE senior status.

503 - ENGINEERING METHODS 2 (3+0)
3.00 Credit(s)
The professional method of dealing with engineering problems. The design-analysis-synthesis of a problem using this process. Prerequisite: EE 502.

511 - MICROWAVES (3+0)
3.00 Credit(s)
A study of high frequency system characteristics and design with emphasis on the microwave region. Prerequisite: EE 413.

513 - CIRCUIT SYNTHESIS (3+0)
3.00 Credit(s)
Introduction to the principles of modern circuit synthesis. Prerequisite: EE 443.
514 - DIGITAL SIGNAL PROCESSING (3+0)
3.00 Credit(s)
The study of image and speech signal processing algorithms and their implementation on hardware systems. Prerequisite: EE 456.

524 - DIGITAL ELECTRONICS 2 (2+3)
3.00 Credit(s)
Continuation of EE 326 with emphasis on sequential circuits and state machine design. Prerequisite: EE 326.

525 - DIGITAL ELECTRONICS 3 (2+3)
3.00 Credit(s)
Continuation of EE 524 with emphasis on microprocessor implementation of logic design. Prerequisite: EE 524.

531 - ENERGY CONVERSION 2 (3+0)
3.00 Credit(s)
The underlying principles of energy conversion as applied to power systems. Prerequisite: EE 433.

532 - ENERGY CONVERSION 3 (3+0)
3.00 Credit(s)
An introduction to power systems analysis with load flow, faults and stability topics. Prerequisite: EE 531.

541 - CONTROL SYSTEMS 1 (3+0)
3.00 Credit(s)
Theory of classical feedback control systems with emphasis on modeling and transfer function formulation. Analysis of second-order systems. Introduction to stability. Prerequisite: EE 443.

542 - CONTROL SYSTEMS 2 (3+0)
3.00 Credit(s)

543 - CONTROL SYSTEMS 3 (3+0)
3.00 Credit(s)
Selected advanced topics in Control Systems. Possible topics are Nonlinear Control Systems, State-Space Methods, and Sampled Data Systems. Prerequisite: EE 426.

553 - LINEAR INTEGRATED CIRCUITS (3+0)
3.00 Credit(s)
Internal circuit design of linear integrated circuits and their applications. Prerequisite: EE 426.

561 - ELECTRICAL LABORATORY 5 (0+3)
1.00 Credit(s)
Laboratory study of feedback control systems. Co-requisite: EE 541.

564 - SENIOR ELECTRICAL DESIGN 1 (3+0)
3.00 Credit(s)
Initiation of a comprehensive design project relevant to electrical engineering. Prerequisite: Senior standing in electrical engineering.

565 - SENIOR ELECTRICAL DESIGN 2 (3+0)
3.00 Credit(s)
Continuation of comprehensive design project. Prerequisite: EE 564.

566 - SENIOR ELECTRICAL DESIGN 3 (3+0)
3.00 Credit(s)
Completion of a comprehensive design project. Prerequisite: EE 565.

572 - ELECTRICAL LABORATORY 7 (0+3)
1.00 Credit(s)
Study of the generalized machine and other DC, synchronous, and induction machines. (Formerly EE 562.) Co-requisite: EE 531.

582 - COMMUNICATION THEORY 1 (3+0)
3.00 Credit(s)
An introduction to the principles of communication theory. (Formerly EE 572.) Prerequisite: EE 443.

583 - COMMUNICATION THEORY 2 (3+0)
3.00 Credit(s)
A continuation of EE 582. Design of time division multiplexers, analog and digital modulation and detection techniques. Prerequisite: EE 582.

584 - COMMUNICATIONS LAB
1.00 Credit(s)
A laboratory study of communication circuits and associated measurement techniques. Co-requisite: EE 583.

590 - PROJECTS
1.00 to 3.00 Credit(s)
Independent planning and conduct of an engineering or development project in electrical engineering. Prerequisite: Permission of instructor.

591 - INDEPENDENT STUDY
1.00 to 3.00 Credit(s)
Individual study of a topic of particular interest to the student in electrical engineering. Prerequisite: Permission of instructor.

592 - SPECIAL TOPICS
1.00 to 3.00 Credit(s)
A study of selected topics of current interest in electrical engineering. Prerequisite: Permission of instructor.
Professors Maier (Chair), Rider; Associate Professors Cowan, Oruma; Assistant Professor Marquart; Visiting Assistant Professor Mora.

Mechanical engineering is that branch of the profession of engineering which is concerned with the conversion of energy from one form to another, the design of machines, and the control of various processes. Mechanical engineers are involved in creative design, research, development, and management. They are being challenged today, as never before, to solve many critical problems related to productivity, mass transportation, and the supply of energy.

Every mechanical engineering student uses extensively the engineering laboratories along with the computer graphics, computer aided design and computer assisted machining laboratories. The laboratories are equipped to supplement all engineering courses. They also provide the opportunity for individual as well as group projects and limited undergraduate research.

Subject - Mechanical Engineering (ME)

403 - MANUFACTURING PROCESSES (2+2)
3.00 Credit(s)
Introduction to contemporary material processing including molding, machining, hot and cold working. A detailed study of these processing methods using basic machining tools and operations, casting and molding equipment, and metal forming. Laboratory work includes evaluating basic material properties, heat treatment, and processing operations. Prerequisite: GE 402.

405 - THEORY OF MACHINES 1 (3+3)
4.00 Credit(s)
Analysis and synthesis of mechanisms for motion, velocity, and acceleration properties. Linkages, cams, gears, and gear trains are treated. Analytical, graphical, and computer solutions are covered. Laboratory assignments deal with analysis and synthesis. Prerequisite: GE 105, 130 and 404.

406 - THEORY OF MACHINES 2 (3+2)
4.00 Credit(s)
Continuation of ME 405. Static and dynamic force analysis in plane and space mechanisms are treated. Introduction to robotics. Laboratory assignments deal with computer solutions and robotics. Prerequisite: ME 405.

415 - THERMODYNAMICS 1 (4+0)
4.00 Credit(s)

416 - THERMODYNAMICS 2 (4+2)
5.00 Credit(s)
Relations among thermodynamic properties, mixtures, chemical reactions and equilibrium. Topics in gas dynamics and turbomachines. Laboratory experience with fluid property variations, refrigeration and heat engine systems, fans and compressors. Prerequisite: ME 415.

424 - ANALYTICAL METHODS (3+1.5)
4.00 Credit(s)
A treatment of numerical methods applicable to problems arising in engineering practice; exact and approximate solutions are investigated; finite methods are used for linear and nonlinear equation solution; ordinary and partial differential equations are treated. Fortran 77 programs designed and spreadsheets introduced. Prerequisites: MATH 361 and GE 230.

426 - FLUID MECHANICS 1 (3+0)
3.00 Credit(s)
An introduction to the mechanics of fluids; the state of stress in a static fluid; the dynamics of inviscid ideal fluids; Euler’s equation, Navier-Stokes equations, Bernoulli’s equation, and momentum equation. Prerequisites: PHYS 231 and GE 312.

435 - ENGINEERING ANALYSIS (3+0)
3.00 Credit(s)
The professional method as it applies to the analysis of engineering problems. Emphasis is placed on learning to deal with new situations in terms of fundamental principles. Prerequisite: MATH 361.
444 - COMPUTER GRAPHICS (3+3)  
4.00 Credit(s)  
Practical studies involving the application of computer graphics in industry. Studies of hardware configurations and standard supportive software packages such as GKS and PHIGS. Prerequisites: GE 230.

445 - FINITE ELEMENT ANALYSIS (3+0)  
3.00 Credit(s)  
The finite element techniques are studied. Stress-deformation problems are solved. Modeling strategies are presented. The ANSYS computer program is used. Prerequisites: GE 404 and ME 424.

511 - MECHANICAL DESIGN 1 (3+3)  
4.00 Credit(s)  
Fatigue analysis, fracture mechanics, and statistical considerations in design. Design and selection of various machine parts. Design teams begin comprehensive design project using OFD, DFM, DFA, and environmental and safety considerations. Use of CAD. Prerequisites: ME 403, 406, 435 and 445.

512 - MECHANICAL DESIGN 2 (3+3)  
4.00 Credit(s)  
Design and selection of various machine parts. Continuation of comprehensive design project using DFA, tolerance analysis, economics, Taguchi method and parametric and variational system considerations. Use of CAD. Prerequisite: ME 511 and 534. Co-requisite: ME 522.

513 - MECHANICAL DESIGN 3 (1+6)  
3.00 Credit(s)  
Ethics, composites and other topics studied. Completion of the comprehensive design project of ME 511 and 512, with considerations given to reliability, optimization, and product liability. Use of CAD. Prerequisite: ME 512.

521 - HEAT TRANSFER 1 (3+0)  
3.00 Credit(s)  
Heat conduction in steady and nonsteady state in one and two dimensions; thermal radiation concepts and heat exchange. Graphical, numerical and electrical analog methods of solutions. Prerequisite: PHYS 232.

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### MECHANICAL ENGINEERING—CLASS OF 1995

**Junior 1993-94**

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<td>Mechanics of Materials 2, Theory of Machines 1, 2 (201404, 204405-6)</td>
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<td>Prob. &amp; Stat. for Engrs, Thermodynamics 1, 2 (201401, 204415-6)</td>
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<td>Computer Graphics, Engineering Analysis, Fluid Mechanics 1 (204444-435-26)</td>
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<td>Analytical Methods, Engr. Mtl. Sc., Manufacturing Proc. (204424, 201402, 204403)</td>
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<td>Tech Communication, Finite Element Analysis, Engr. Mtl. Sc. Lab. (153390, 204445, 201403)</td>
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### MECHANICAL ENGINEERING—CLASS OF 1994

**Senior 1993-94**

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<td>Heat Transfer 1, 2, Energy Systems (204521-2-6)</td>
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<td>Fluid Mechanics 2, Tech. Elective*, Humanities Elective (204534, . . . . . . . .)</td>
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**Acceptable science electives: Modern Physics 124303, Geology 202453, Environmental Chemistry 122115.
522 - HEAT TRANSFER 2 (3+2)
4.00 Credit(s)
Thermal radiation. Fundamentals of convection; empirical correlations; free and forced convection. Application to design. Laboratory reinforced study of conduction, convection, radiation and design. Prerequisite: ME 521.

526 - ENERGY SYSTEMS (3+2)
4.00 Credit(s)
Heat power systems utilizing concepts of thermodynamics, fluid mechanics, and heat transfer. Examples such as solar energy and energy recuperation systems are studied along with optimization techniques. Laboratory involves energy related projects. Prerequisites: ME 416, 522 and 534.

534 - FLUID MECHANICS 2 (3+2)
4.00 Credit(s)
Elements of potential flow and boundary layer theory. Applications to piping systems, aerodynamics, flow measurement and turbomachinery. Concurrent laboratory experience with flow patterns, pressure and velocity profiles, pumps, fans, and turbines. Introduction to computational fluid mechanics. Prerequisite: ME 426.

541 - VIBRATION ANALYSIS (3+0)
3.00 Credit(s)
Studies in the fundamentals of linear vibration include damped and undamped systems, single or multi-degree of freedom systems, and free or forced vibration. Prerequisite: ME 406.

542 - CONTROL SYSTEMS (4+2)
5.00 Credit(s)
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 analog simulations, digital logic design, and performance studies of real systems. Prerequisites: ME 424 and 541.

556 - PRODUCTION ENGINEERING (3+0)
3.00 Credit(s)
An introduction to scientific organizing, standardizing, and operating principles in production engineering. Capabilities of manufacturing processes. Fundamentals of time and motion study, engineering economy, statistical quality control, location and material flow for a manufacturing enterprise. Prerequisite: ME 403.

590 - MECHANICAL ENGINEERING PROJECT
1.00 to 5.00 Credit(s)
Practical studies of investigations involving the application of original thought, the determination of new information and/or new application of known information or equipment. Prerequisite: ME 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 109-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 6,100 pharmacists have been graduated by this institution and its graduates are particularly active in local, state, and national health-related organizations.

Pharmacy Alumni Endowed Chair established in 1984 through the generosity of pharmacy alumni and friends in celebration of the centennial of the college. The recipients of this chair include:

- 1988 Metta Lou Henderson, Ph.D., prof. of pharmacy
- 1989 Thomas P. Faulkner, Ph.D., prof. of pharmacology
- 1990 Thomas A. Gossel, Ph.D., prof. of pharmacology
- 1991 Thomas G. Stewart, Ph.D., prof. of medicinal chemistry
- 1992 Donald W. Stansloski, Ph.D., prof. of pharmacy

Accreditation and Affiliations

The Bachelor of Science in Pharmacy program is accredited by the American Council on Pharmaceutical Education and is 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, the American Institute of the History of Pharmacy, and the Council of Ohio Colleges of Pharmacy.

Departments

- Department of Pharmacy Practice (Dept. 311)
- Department of Pharmaceutical and Biomedical Sciences (Dept. 312)

Mission Statement

The mission of the College of Pharmacy is to facilitate the intellectual, moral, and spiritual growth of responsible men and women, so that they may be prepared to contribute effectively to an increasingly caring and compassionate profession of pharmacy.

To fulfill this stated mission the following general goals have been developed. Each goal statement is linked to specific areas of the curriculum, and is continually reviewed for appropriateness.

**Goal No. 1:** To graduate persons with excellent professional skills, well-grounded in the liberal arts, educated in methods of scholarly inquiry and research, and imbued with high aspirations of ethical and intellectual performance.

**Goal No. 2:** To develop baccalaureate and doctor of pharmacy programs that are consistent with the health needs of society and are feasible within the resources of the college.

**Goal No. 3:** To develop and maintain processes that will assist students, faculty, and alumni toward a sense of commitment and social responsibility, a sensitivity and responsiveness to the needs of others, and a responsibility for oneself and one's actions.

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 years of English, four years of mathematics (algebra I and II, plane geometry, trigonometry or precalculus, or calculus) and three years of science including biology and chemistry. 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.

Bachelor of Science in Pharmacy Degree Requirements

The Bachelor of Science Degree in Pharmacy is a five-year curriculum that provides a foundation in the basic sciences of pharmacy as well as a comprehensive understanding of health care settings. For the purpose of administration, the pharmacy program is divided into two major divisions: the Lower Division, consisting of the first two years (P-1 and P-2), and the Upper Division, consisting of the last three years (P-3, P-4, and P-5).

The program of study leading to the degree of Bachelor of Science in Pharmacy requires a total of 255 quarter hours of study, and is a combination of general education courses, basic sciences, professional pharmacy courses, and electives. The total of 255 quarter hours is divided according to the following:

<table>
<thead>
<tr>
<th>Category</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General education courses</td>
<td>49</td>
</tr>
<tr>
<td>Basic science courses</td>
<td>50</td>
</tr>
<tr>
<td>Professional courses</td>
<td>131</td>
</tr>
<tr>
<td>Electives</td>
<td>25</td>
</tr>
</tbody>
</table>

General Education Requirements. The liberal studies component of the pharmacy degree curriculum consists of 49 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 communications competence, culture and society, aesthetic sensibility, and human values.

Communication Competence
Writing 110
Writing 111
Speech Communication 100
Interpersonal Communication 225

Culture and Society
Great Works of Literature 204
Western Civilization 110 and 111
Psychology 100
Sociology 105
Economics 100
One course in non-Western, Third World culture

Aesthetic Sensibility
Art 100
Music 100 or Theatre 105

Human Values
Philosophy 100
Ethics 238
Religion East and West 107

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. The required science courses are ordinarily completed in the Lower Division years.

Chemical Principles 121, 122, 123
Fundamentals of Organic Chemistry 221, 222, 223
General Biology 121
Introduction to Zoology 122
Introduction to Human Anatomy and Histology 124
Physiology 331, 332, 333
Introduction to Calculus 154
Introductory Data Analysis 156

Professional Pharmacy Requirements.
Courses in pharmaceutical sciences, 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**
- Pharmaceutics 321, 322, 323
- Biochemistry 341, 342
- Immunology 375
- Microbiology 361
- Medicinal Chemistry 376, 377
- Introduction to Pathophysiology 390
- Introduction to Pharmacology 391
- Pharmacology 481, 482, 483
- Chemotherapy of Infectious Disease 421
- Toxicology 521

**Pharmacy Practice**
- Prescription Compounding 344
- Therapeutics 481, 482
- Pharmaceutical Law 551
- Pharmaceutical Marketing 452
- Pharmaceutical Management 553
- Health Care Systems 554
- Pharmacy Practice 484, 486
- Pharmacy Practice Laboratory 487
- Clinical Pharmacy 565
- Introduction to Drug Information 563
- Advanced Pharmacokinetics 480
- Structured Externship 580

**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.

**Bachelor of Science in Pharmacy Degree Curriculum**

**First Year**
- Chemical Principles 121, 122, 123 12 hours
- General Biology 121 4 hours
- Introduction to Zoology 122 4 hours
- Introduction to Human Anatomy and Histology 124 4 hours
- Introduction to Calculus 154 4 hours
- Introductory Data Analysis 156 4 hours
- Pharmacy Orientation 101 0 hours
- The Profession of Pharmacy 102, 103 2 hours
- Writing 110, 111 6 hours
- General Education 10 hours
- TOTAL 50 hours

**Second Year**
- Fundamentals of Organic Chemistry 221, 222, 223 9 hours
- Physiology 331, 332, 333 9 hours
- Speech Communication 100 3 hours
- Introduction to Pharmacy Practice 212 3 hours
- Great Works of Literature 204 3 hours
- General Education 26 hours
- TOTAL 53 hours

**Third Year**
- Pharmaceutics 321, 322, 323 12 hours
- Prescription Compounding 344 2 hours
- Biochemistry 341, 342 8 hours
- Immunology 375 3 hours
- Medicinal Chemistry 376 3 hours
- Microbiology 361 4 hours
- Introduction to Pathophysiology 390 3 hours
- Introduction to Pharmacology 391 3 hours
- General Education 1 hour
- Electives 13 hours
- TOTAL 52 hours

**Fourth Year**
- Pharmacy Practice 485, 486 7 hours
- Pharmacy Practice Laboratory 487 1 hour
- Pharmacology 481, 482, 483 11 hours
- Chemotherapy of Infectious Disease 421 4 hours
- Advanced Pharmacokinetics 480 2 hours
- Therapeutics 481, 482 8 hours
- Medicinal Chemistry 377 3 hours
- Pharmaceutical Marketing 452 3 hours
- Introduction to Drug Information 563 2 hours
- Electives 9 hours
- TOTAL 50 hours

**Fifth Year**
- Toxicology 521 3 hours
- Pharmaceutical Law 551 4 hours
- Pharmaceutical Management 553 4 hours
- Health Care Systems 554 4 hours
- Clinical Pharmacy 565 16 hours
- Structured Externship 580 16 hours
- Electives 3 hours
- TOTAL 50 hours

**Doctor of Pharmacy Degree**
The Doctor of Pharmacy degree being developed is an extended curriculum that provides for both basic and specialized competencies in the practice of pharmacy. A more detailed statement about this program is available through the Student Services Center of the College of Pharmacy.
Requirements for Graduation

Each candidate for a Bachelor of Science in Pharmacy degree:
1. Must be of good moral character.
2. Must have completed the required curriculum.
3. Must have earned a cumulative grade point average of 2.00 in all course work.
4. Must have a "C" or better in all required professional courses.
5. Must satisfy a minimum residency requirement as established by the dean of the college.
6. Must be recommended for the degree by a majority vote of the faculty of the University.
7. Must meet such other qualifications as the faculty of the college may determine.

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 developed during the academic year or changes 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. Students registered for Clinical Pharmacy 565 or Structured Externship 580 may not register for any additional required professional courses and need the written permission of the dean of the College of Pharmacy to register for additional elective courses.
3. Students who wish to register for courses that have conflicting time schedules need the written permission of both the faculty members and the dean of the College of Pharmacy.
4. 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.
5. Students may repeat courses to improve their understanding of the material or to improve their grade, in which case only the last grade earned is used in calculating their accumulative grade point average.

S/U Grade Option

Students in the College of Pharmacy may register for courses according to the Satisfactory/Unsatisfactory policies of the college of course registration. Only those courses that are ordinarily graded only S/U may be used as credit toward graduation. All courses from the College of Arts and Sciences and the College of Business Administration have the option of S/U grading. All courses must be taken within the following guidelines:
1. Required general education courses may not be graded S/U.
2. Required science courses may not be graded S/U.
3. Except for those courses that are ordinarily graded as S/U, students must declare for the S/U option at the start of the quarter of registration, and may not change the grading option after the second week of the quarter.

Classification of Students

Students enrolled in the Pharmacy program are initially classified as P-1 students (unless admission to advanced standing has been granted to a student transferring from another accredited college or university). Students are advanced in standing according to the following:
P-2, upon completion of 50 quarter hours including Chemical Principles 121, 122, and 123; P-3 upon completion of 100 quarter hours including Fundamentals of Organic Chemistry 221, 222, and 223; P-4 upon completion of 150 quarter hours including Pharmaceutics 321, 322, and 323; P-5 upon completion of 200 quarter hours including Pharmacy Practice 485, 486 and 487. In addition, all required courses in the Lower Division must be completed before the student is permitted to enter the second year of the Upper Division (P-4 year). Other information relative to the requirements for reclassification of standing may be obtained in the Student Services Center of the College of Pharmacy.

Standards of Scholarship

A student who fails to maintain the prescribed standards of scholarship will be subject to one of the following actions, namely: 1) being placed on probation, 2) being suspended from the college, or 3) being dismissed from the college.
If a student's accumulative grade point average falls below 2.00, the student will be placed on probation. If a student on probation does not restore the grade point average during the following or any subsequent quarter, the student will be subject to further academic action, including continued probation, suspension or dismissal. Any student with an unusually low grade point average for any quarter may be placed on probation or suspended.

If action is taken to suspend a student, the suspension will be for a definite period of time after which the student will be eligible to apply for readmission. If readmission is granted, the faculty may establish certain conditions of academic performance for the student to remain enrolled in the College of Pharmacy. 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 Pharmacy at any time thereafter.

**Dual Degree Programs**

Superior students may elect to earn an additional degree from the College of Arts and Sciences or from the College of Business Administration concurrently with the Bachelor of Science degree in Pharmacy. The student following this option pursues both degrees simultaneously under the supervision of an advisor from the College of Pharmacy and an advisor selected from the other college. Tuition is charged at the College of Pharmacy rate and the student receives the appropriate degree in each college upon completion of all requirements.

A student taking the dual degree program must meet all of the requirements established for each degree. Certification of completion of these requirements is made by the college granting a degree.

Information relative to the procedure for declaring a dual degree program is available from the Student Services Center of the College of Pharmacy.

**Pharmacy/Law Joint Degrees Program**

The pharmacy/law joint degrees program is a seven-year curriculum that provides for substantial educational and research experience in pharmacy and law. The Bachelor of Science in Pharmacy degree is awarded following the summer term of the fifth year; the Juris Doctor at the end of two additional years of study. A more detailed statement about this program is available from the Student Services Center of the College of Pharmacy.

**Student Services**

The College of Pharmacy provides specialized services to students and alumni through the staff of the Student Services Center, including academic advising, peer tutoring, peer focus groups, personal counseling, career counseling, and job placement. The staff of the Center also coordinates professional organization functions, student group activities, and serves as the focus for special project planning and implementation. Prospective students are encouraged to contact the Center for further information in these areas.

**Special Notice**

Because of rapid developments in the health professions, the curriculum of the College of Pharmacy is 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.
311 - SPECIAL TOPICS IN DRUG ABUSE EDUCATION (1+0)
1.00 Credit(s)
This community service-oriented course involves presenting drug abuse education talks to various community groups, including middle school and high school students. The pharmacy student is provided the 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.

321 - PHARMACEUTICS 1 (3+3)
4.00 Credit(s)
This course deals with the physical pharmacy, pharmaceutical, and biopharmaceutical aspects of a variety of drug delivery systems, predominantly solution 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. (Formerly PHCA 321.) Prerequisites: CHEM 231, 232 and 233; BIOL 331, 332, and 333; MATH 154, 155 and 156; and P-3 standing.

322 - PHARMACEUTICS 2 (3+3)
4.00 Credit(s)
This course deals with the physical pharmacy, pharmaceutical and biopharmaceutical aspects of a variety of drug delivery systems, predominantly solid oral 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. This course will also emphasize the concepts of bioavailability and bio- and generic equivalence of oral products. (Formerly PHCA 322.) Prerequisites: PHCA 212 and PHBS 321.

323 - PHARMACEUTICS 3 (3+3)
4.00 Credit(s)
This course covers the pharmaceutic, biopharmaceutic and pharmacokinetic aspects of suspensions, emulsions, aerosols and semisolids. Controlled release drug delivery systems as well as drug absorption from the skin, rectum, vagina and lungs are discussed and treated in a quantitative manner. Novel and experimental delivery systems will also be examined as simple pharmacodynamic models. (Formerly PHCA 323.) Prerequisite: PHBS 322.
341 - BIOCHEMISTRY 1 (4+0)
4.00 Credit(s)
An introduction to 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. Prerequisite: CHEM 233.

342 - BIOCHEMISTRY 2 (4+0)
4.00 Credit(s)
A description of 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 Credit(s)
An introduction to 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 Credit(s)
An introduction to the use of biochemical tests as agents for the diagnosis of human disease states. The theory, methodology, utility, significance, and reliability of such tests are discussed. Prerequisite: PHBS 342 or permission of instructor.

361 - MICROBIOLOGY (4+0)
4.00 Credit(s)
An introductory course emphasizing fundamentals of general microbiology and a general survey of techniques and principles pertaining to bacteria, yeasts, molds, viruses, and rickettsia. Microbial pathogens and a detailed consideration of the host-parasite relationship are emphasized. Prerequisite: One year of general biology or botany-zoology. Co-requisite: PHBS 341.

375 - IMMUNOLOGY (3+0)
3.00 Credit(s)
A course to introduce modern immunology and immunotherapy. It covers an understanding of 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. Emphasis will be on the use of immunobiologials currently available in the USA for prevention and treatment of most common infections and immunologic diseases. The role of biotechnology as a source of immunobiologials will be discussed. Prerequisite: BIOL 333.

376 - MEDICINAL CHEMISTRY 1 (3+0)
3.00 Credit(s)
The first quarter of a two quarter sequence. Courses interface basic biological information with the basic chemical subjects in the setting of pharmaceutical products. Two main paths are taken: the effects of the chemical on the biological system (pharmacodynamics); the means by which the biological system manipulates the chemical and modifies it (pharmacokinetics). The organization is according to pharmacological activity or therapeutic application as much as possible and by chemical type where necessary. Emphasis is placed on basic chemical and biological principles, recognition of pharmacophoric groups, structure activity relationships, and nomenclature of drugs. Prerequisites: CHEM 233 and PHBS 342.

377 - MEDICINAL CHEMISTRY 2 (3+0)
3.00 Credit(s)
The second quarter of a two quarter sequence. Two main paths are taken: the effects of the chemical on the biological system (pharmacodynamics); the means by which the biological system manipulates the chemical and modifies it (pharmacokinetics). The organization is according to pharmacological activity or therapeutic application as much as possible and by chemical type where necessary. Emphasis is placed on basic chemical and biological principles, recognition of pharmacophoric groups, structure activity relationships, and nomenclature of drugs. Prerequisite: PHBS 376.

381 - NATURAL PRODUCTS 1 (2+0)
2.00 Credit(s)
An introductory course which deals with a discussion of important examples of 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 Credit(s)
A continuation of Natural Products 1 dealing specifically with a discussion of 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.
390 - INTRODUCTION TO PATHOPHYSIOLOGY (3+0)
3.00 Credit(s)
An introduction to pathological and pathophysiological principles and concepts encountered in human disease. General pathology and special pathological physiology of respiratory, gastrointestinal (including liver, gallbladder and pancreas), musculoskeletal, dermatological, ophthalmological and otic disorders, are discussed. Diseases involving the cardiovascular system, central nervous system, and the endocrine system are deferred to the pathology and pharmacology sequences (PHBS 481, 482, and 483). Prerequisite: PHBS 342. Co-requisite: BIOL 333.

391 - INTRODUCTION TO GENERAL AND AUTONOMIC PHARMACOLOGY (3+0)
3.00 Credit(s)
The principles and concepts of pharmacology include, but are not limited to, discussion of receptors, dose-response, pharmacodynamic and pharmacokinetic factors leading to variability of responses, and pharmacogenetics. Autonomic and autacoid pharmacology covers drugs affecting the autonomic nervous system. The pharmacodynamic and pharmacokinetic properties are related to the therapeutic basis of drug therapy and toxicological aspects of drug actions. Prerequisite: PHBS 342. Co-requisites: BIOL 333, PHBS 390 and PHCA 323.

421 - CHEMOTHERAPY OF INFECTIOUS DISEASE (4+0)
4.00 Credit(s)
A study of the antibiotics and synthetic chemicals used in the prophylaxis and treatment of infectious diseases. A drug-oriented approach for selected diseases. Included are selective toxicity, dosage forms, choices in therapy, differential diagnosis, MIC, resistance, therapy of common infections, therapy of acid-fast infections, and parasitic disease treatment. Prerequisites: BIOL 333 and PHBS 361 and 377.

422 - CHEMOTHERAPY OF PARASITIC DISEASES (2+0)
2.00 Credit(s)
This course is intended to bridge the gap between the usual material covered in the course Chemotherapy of Infectious Disease and expanded information on the diseases, organisms and information sources, unique to parasitic diseases. Topics include protozoal diseases and helminthic diseases. The natural history and causative agents of the disease, distribution, public health significance, and chemotherapy of the illness will be stressed. Emphasis is on endemic diseases.

441 - MEDICINAL PLANT PROPAGATION AND CULTIVATION (2+3)
3.00 Credit(s)
An introduction to 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. Students are required to research the literature, write, and present reports. Prerequisite: Permission of instructor.

462 - VIROLOGY (2+0)
2.00 Credit(s)
A comprehensive coverage of the virus-host relationship from the viewpoint of molecular biology. Model systems are discussed utilizing the bacteriophage. Prerequisites: PHBS 342 and 361; or permission of instructor.

481 - PATHOLOGY AND PHARMACOLOGY OF THE CARDIOVASCULAR SYSTEM (4+0)
4.00 Credit(s)
An integrated approach to the study of cardiovascular disease states and the therapeutic agents used to treat them. An emphasis is placed on understanding the basic pharmacodynamic and pharmacokinetic properties which underly the therapeutic and toxicologic actions of the cardiovascular drugs. Antineoplastic drugs and their therapeutic applications in the treatment of cancer are also presented. Prerequisites: PHBS 390 and 391.

482 - PATHOLOGY AND PHARMACOLOGY OF THE CENTRAL NERVOUS SYSTEM (4+0)
4.00 Credit(s)
A study of diseases of the central nervous system and the pharmacology of the drugs used to treat them. The pharmacodynamic and pharmacokinetic properties of these drugs are related to therapeutic and toxicologic aspects of the treatment of the diseases. Prerequisites: PHBS 390 and 391.

483 - PATHOLOGY AND PHARMACOLOGY OF THE ENDOCRINE SYSTEM (3+0)
3.00 Credit(s)
An integrated approach to the study of endocrine disorders, including the metabolic disease states and rational use of pharmacologic agents used to treat them. Emphasis is on understanding the basic concepts and principles of pharmacodynamic and pharmacokinetic properties which underly the therapeutic and toxicologic actions of the drugs that affect endocrine and neuroendocrine processes. Prerequisites: PHBS 390 and 391.
502 - PRINCIPLES AND PRACTICE OF PUBLIC HEALTH (3+0)
3.00 Credit(s)
Individual and community aspects of public hygiene, including infections, epidemiology, prophylaxis, and discussion of major illnesses (nutritional, mental, environmental and occupational). Prerequisite: PHBS 361.

511 - VETERINARY PHARMACY (2+0)
2.00 Credit(s)
The various pathological conditions peculiar to animals and the pharmaceuticals used in the treatment thereof. Prerequisite: Permission of instructor.

521 - TOXICOLOGY (3+0)
3.00 Credit(s)
An introduction to the essential subjects in clinical toxicology. Classification and mechanisms of drug and chemical toxicity; environmental, industrial, and household poisoning; emergency management of poisoning. Major emphasis is on areas of clinical importance. Prerequisite: PHBS 481, 482 and 483 or permission of instructor.

545 - DRUGS OF ABUSE (2+0)
2.00 Credit(s)
A more detailed look at some 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. Co-requisite: PHBS 482.

546 - INTRODUCTION TO GERIATRIC PHARMACOLOGY (2+0)
2.00 Credit(s)
An introduction to 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(s)
Students are introduced to research areas in the pharmaceutical, biomedical and pharmacy administration areas, and opportunities in these areas are defined. This course is 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(s)
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(s)
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 Credit(s)
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 Credit(s)
A seminar course involving student presentations of papers and discussions of topics of interest. Current papers in mental illness. Psychedelic drug effects and pharmacologic research are discussed. Prerequisites: PHBS 482 and P-5 standing.

572 - SEMINAR IN TOXICOLOGY (2+0)
2.00 Credit(s)
Student presentation of papers and discussion of topics. Current events and relevant topics in clinical, occupational, industrial, and environmental toxicology are discussed. Prerequisites: PHBS 481, 482 and 483 and P-5 standing. Co-requisite: PHBS 521.

573 - SEMINAR IN PEDIATRIC PHARMACOLOGY (2+0)
2.00 Credit(s)
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 Credit(s)
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. Prerequisites: PHBS 481, 482 and 483.

590 - SPECIAL TOPICS IN PHARMACEUTICAL AND BIOMEDICAL SCIENCES
1.00 to 3.00 Credit(s)
Can be repeated as the subject varies. Prerequisite: Permission of the instructor.

594 - SEMINAR IN PHARMACEUTICAL AND BIOMEDICAL SCIENCES
1.00 to 3.00 Credit(s)
Can be repeated as the subject varies. Prerequisite: Permission of the instructor.

597 - INDEPENDENT STUDY-PHARMACEUTICAL AND BIOMEDICAL SCIENCES
1.00 to 3.00 Credit(s)
Can be repeated as the subject varies. Prerequisite: Permission of department chairman and cumulative grade point average of 2.50.

DEPARTMENT OF PHARMACY PRACTICE

(Department 311)

Professors Henderson, Hoag, Previte, Stansloski (Chair); Associate Professors Earle, Goldberg, Jones, K. Kier, Lucas (part-time), Reiselman, L. Savino, Shoemaker; Assistant Professors Rosenbaum, Stanovich; Assistant Clinical Professors Ballentine (part-time), Bonfiglio (part-time), Gearhart (part-time), Gibbs (part-time), Hulisz (part-time), Mosdell, Nesbit; Instructors T. Kier, J. Turner; Assistant Instructor M. Turner (part-time).

Subject - Pharmacy Practice (PHPR)

101 - PHARMACY ORIENTATION (1+0)
.00 Credit(s)
Operations and goals of the University and the College of Pharmacy. The student is also made aware of the various services and opportunities offered on campus.

102 - THE PROFESSION OF PHARMACY 1 (1+0)
1.00 Credit(s)
The profession of pharmacy; its development, its educational requirements, the role of the pharmacist and the challenges.

103 - THE PROFESSION OF PHARMACY 2 (1+0)
1.00 Credit(s)
Continuation of PHPR 102.

212 - INTRODUCTION TO PHARMACY PRACTICE (3+0)
3.00 Credit(s)
Practical principles of law as they pertain to pharmacy interns, third party payment practices, and patient profiles are also covered. A major emphasis is placed on mathematics as applied to pharmacy including the prescription, Latin symbols, metrology, reducing and enlarging formulae, dilution and concentration, isotonic solutions and electrolyte solutions.

301 - SEMINAR IN PHARMACY COMMUNICATIONS (3+0)
3.00 Credit(s)
Basic elements of communication involving health care personnel. Didactic presentation and role-playing to gain experience in communication skills. (Formerly CLIN 301.) Prerequisite: P-3 standing or permission of the instructor.

344 - PRESCRIPTION COMPOUNDING (1+3)
2.00 Credit(s)
Basic pharmaceutical concepts and techniques necessary to prepare extemporaneous 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. Corequisite: PHBS 321. Prerequisite: PHPR 212.

354 - DRUGS, HEALTH CARE AND THE CONSUMER (3+0)
3.00 Credit(s)
Acquaints nonpharmacy students with basic principles associated with drugs and the health care system. Topics include general information that will enable consumers to make rational decisions about their medical care. (Formerly CLIN 354.)

421 - INTRODUCTION TO HOSPITAL PHARMACY (3+0)
3.00 Credit(s)
Material on the history and organization of hospitals and hospital pharmacy departments. Special emphasis is placed on the responsibilities and
professional activities of pharmacists within the hospital environment. (Formerly CLIN 421.) Prerequisite: P-3 standing or permission of the instructor.

422 - PHARMACY SERVICE TO NURSING HOMES (1+0)
1.00 Credit(s)
The pharmacists' opportunities and responsibilities in nursing home practice. Main emphasis on consulting and distribution functions which include selecting a drug distribution system, conducting a drug regimen review and establishing a drug utilization review system. The relationship of pharmacy to nursing home management, patients and personnel is also discussed. Prerequisite: P-4 standing.

431 - HISTORY OF PHARMACY (3+0)
3.00 Credit(s)
The educational, organizational and professional growth and development of pharmacy in the United States. Prerequisite: P-4 standing.

452 - PHARMACEUTICAL MARKETING (3+0)
3.00 Credit(s)
Facts, considerations, and principles which underlie the flow of drug products, and the availability or use of pharmaceutical and other professional services from production to consumption. Principal economic, legislative, and social forces affecting the health care industry are discussed, and resulting policies and procedures are appraised. (Formerly PHCA 552.)

476 - INFECTIOUS DISEASE (3+0)
3.00 Credit(s)
Seminar discussions of various infectious diseases. The student will research one new area of interest in infectious diseases and present it to the class. (Formerly CLIN 476.) Prerequisites: PHBS 390 and 421.

478 - OUTPATIENT PHARMACY SERVICE (0+3)
1.00 Credit(s)
Laboratory course that serves 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.

480 - CLINICAL PHARMACOKINETICS (2+0)
2.00 Credit(s)
Prerequisite(s): PHBS- 323 Physiologic application of pharmacokinetic theory and therapeutic drug monitoring. (Formerly CLIN 480.) Prerequisite: PHBS 323.

481 - THERAPEUTICS 1 (4+0)
4.00 Credit(s)
The process of therapeutic decision-making, taught on a problem-oriented record model. A variety of disease states is covered. (Formerly CLIN 481.) Co-requisites: PHPR 461 and PHBS 482. Prerequisites: PHPR 480 and PHBS 421 and 481.

482 - THERAPEUTICS 2 (4+0)
4.00 Credit(s)
This course continues the format of PHPR 481. Special emphasis is placed on current controversies in therapeutic problem solving. (Formerly CLIN 482.) Co-requisites: PHPR 462 and PHBS 483. Prerequisite: PHPR 481.

485 - PHARMACY PRACTICE 1 (4+0)
4.00 Credit(s)
The contemporary practice of pharmacy. Topics include dispensing systems, patient counseling, drug interactions, patient profile systems and the basic principles, equipment and techniques involved in the preparation, manipulation and administration of parenteral products. (Formerly PHCA 461.) Co-requisites: PHPR 480 and PHBS 481. Prerequisites: PHPR 344 and PHBS 323.

486 - PHARMACY PRACTICE 2 (3+0)
3.00 Credit(s)
The appropriate use of nonprescription drugs, products and devices. (Formerly PHCA 462.) Co-requisite: PHPR 482. Prerequisites: PHBS 481, 482 and 483.

487 - PHARMACY PRACTICE LABORATORY (0+3)
1.00 Credit(s)
Experience in solving pharmaceutical problems, in both hospital and community sites. Emphasis will be placed on solution methods utilizing patient profiles, patient questioning and counseling, drug information sources and aiding the physician in therapeutic decisions. The student will also be given exercises in aseptic technique and filling of IV admixtures. (Formerly PHCA 463.) Co-requisites: PHPR 481 and PHBS 482 and 483. Prerequisites: PHPR 480 and 485 and PHBS 481.

488 - SEMINAR IN PARENTERAL THERAPY (2+0)
2.00 Credit(s)
Various aspects of parenteral therapy. Topics include dosage forms, characteristics, preparation, administra- tion and complications of therapy. (Formerly PHCA 466.) Prerequisite: PHPR 485 or permission of the instructor.
530 - MANUFACTURING PHARMACY (1+6)
3.00 Credit(s)
The formulation and fabrication by mechanized methods of a variety of pharmaceutical dosage forms. Graded S/U. Prerequisite: Permission of the instructor.

551 - PHARMACEUTICAL LAW (4+0)
4.00 Credit(s)
Professional ethics and the philosophy, requirements, administration, and enforcement of local, state and federal laws related to the practice of the profession of pharmacy.

553 - PHARMACEUTICAL MANAGEMENT (4+0)
4.00 Credit(s)
Management science as it applies to the practice of pharmacy as both a profession and a business. Included are the internal and external economic forces that influence day to day operations. Special emphasis on financial report analysis and decision making.

554 - HEALTH CARE SYSTEMS (4+0)
4.00 Credit(s)
The development of the health care system and its present status. Contemporary issues in health care will be examined from a systems viewpoint. Prerequisite: PHPR 487.

563 - INTRODUCTION TO DRUG INFORMATION (1+3)
2.00 Credit(s)
Retrieval and evaluation of drug literature, dissemination and communication of non-biased drug information and the organization and development of a drug information center. (Formerly CLIN 563.) Prerequisites: PHPR 462 and 463; PHBS 421; and P-5 standing.

564 - SURVEY OF RESEARCH AREAS IN THE PHARMACEUTICAL SCIENCES 3 (1+0)
1.00 Credit(s)
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 - CLINICAL PHARMACY (3+17)
16.00 Credit(s)
Contemporary clinical pharmacy. Taught in affiliated hospitals. Students are asked to apply pharmaceutical principles to the study of drugs, diseases and patients. Transportation and housing are arranged by the student. (Formerly CLIN 560.) Prerequisites: PHPR 462, 463, 481 and 482; PHBS 421, 481, 482 and 483; P-5 standing; and a valid Ohio Intern license.

580 - STRUCTURED EXTERNSHIP (0+45)
16.00 Credit(s)
Structured experiences in various health care centers. Provides the student with experience in the actual application of material learned in didactic subjects. Prerequisites: PHPR 486 and 487; PHBS 421; P-5 standing; and a valid Ohio Intern license.

590 - SPECIAL TOPICS IN PHARMACY PRACTICE
1.00 to 3.00 Credit(s)
Can be repeated as the topic varies. Prerequisite: Permission of the instructor.

594 - SEMINAR IN PHARMACY PRACTICE
1.00 to 3.00 Credit(s)
Can be repeated as the topic varies. Prerequisite: Permission of the instructor.

597 - INDEPENDENT STUDY-PHARMACY PRACTICE
1.00 to 3.00 Credit(s)
Can be repeated as the topic varies. Prerequisites: Permission of department chairman and 2.50 accumulative grade point average.

610 - SEMINAR IN CLINICAL PHARMACY 1
1.00 Credit(s)
The practice of contemporary pharmacy. Updated reviews on various areas of therapeutics, individual investigational agents and treatment modalities, or emerging new classes of drugs. Presentations will be made by students and invited speakers with emphasis on development of student skills in oral presentations. (Formerly CLIN 610.) Prerequisite: Completion of P1-P4 years.

611 - SEMINAR IN CLINICAL PHARMACY 2
1.00 Credit(s)
Continuation of PHPR 610. (Formerly CLIN 611.) Prerequisite: Completion of P1-P4 years.

612 - SEMINAR IN CLINICAL PHARMACY 3
1.00 Credit(s)
Continuation of PHPR 611. (Formerly CLIN 612.) Prerequisite: Completion of P1-P4 years.
620 - ADVANCED PATHOPHYSIOLOGY AND THERAPEUTICS 1
6.00 Credit(s)
Physiology and pathophysiology of disease processes, covered in a standard medically-related systems approach, and in-depth treatment of available therapeutic modalities. Discussions further include: (a) findings of current literature and comparison to standard text material; (b) focus on problem solving/decision making based on case examples; (c) drug dosing including unique disease states or special patient circumstance as they affect dosing considerations; (d) treatments of choice including cost effectiveness and ethical considerations; and (e) introduction of investigational modes of therapy. (Formerly CLIN 620.) Prerequisites: PHPR 481 and 482; PHBS 482 and 483; and completion of P1-P4 years.

621 - ADVANCED PATHOPHYSIOLOGY AND THERAPEUTICS 2
6.00 Credit(s)
Continuation of PHPR 620. (Formerly CLIN 621.) Prerequisite: PHPR 620 and completion of P1-P4 years.

622 - ADVANCED PATHOPHYSIOLOGY AND THERAPEUTICS 3
6.00 Credit(s)
Continuation of PHPR 621. (Formerly CLIN 622.) Prerequisites: PHPR 621 and completion of P1-P4 years.

630 - APPLIED BIOSTATISTICS IN PHARMACY
6.00 Credit(s)
A review of 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 in the evaluation of clinical studies. (Formerly CLIN 630.) Prerequisites: MATH 156 and completion of P1-P4 years.

631 - ADVANCED CLINICAL PHARMACOKINETICS
5.00 Credit(s)
Use of mathematical and computer modeling to explore the derivation of the principles learned in earlier courses. The specific pharmacokinetic parameters of a group of drugs is discussed by investigating pharmacokinetic research literature. The application of these concepts to dosing patients is emphasized throughout the course, and specific case studies are included. (Formerly CLIN 631.) Prerequisites: PHBS 321, 322 and 323; PHPR 480; and completion of P1-P4 years.

632 - DRUG LITERATURE EVALUATION
3.00 Credit(s)
Evaluation of drug information sources (including the primary scientific literature). Process used to make authoritative judgments based on information provided from principles of research methodology. Application of epidemiologic methods to the characteristics and events of drug use. Emphasis will be on student application of drug literature evaluation skills. (Formerly CLIN 632.) Prerequisites: PHPR 563 and 630; and completion of P1-P4 years.

640 - INTRODUCTION TO CLINICAL CLERKSHIP
3.00 Credit(s)
Preparation for Clerkship in Clinical Pharmacy. Experience in analytical and communication skills toward the achievement of specified objectives. Description of various clerkship settings and the type of experience the student may gain there. Various aspects of physical assessment will also be introduced. (Formerly CLIN 640.) Prerequisite: P-5 standing.

650 - CLERKSHIP IN CLINICAL PHARMACY
6.00 Credit(s)
Full-time experiential program emphasizing delivery of pharmaceutical care in primary, secondary and tertiary patient care settings. This educational process will occur in both institutional and ambulatory settings, and 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. (Formerly CLIN 650.) Prerequisites: PHPR 610, 611, 612, 620, 621, 622, 630, 631, 632 and 640. May be repeated for up to 60 credit hours.